2023 Groundwater Monitoring Program
Ryley Class I Waste Management Facility
Ryley, Alberta

PRESENTED TO

Clean Harbors Environmental Services, Inc.

MARCH 26, 2024
ISSUED FOR USE
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EXECUTIVE SUMMARY

Clean Harbors Environmental Services Inc. (Clean Harbors) retained Tetra Tech Canada Inc. (Tetra Tech) to conduct the 2023 Groundwater Monitoring and Sampling Program (GMP) at the Ryley Landfill facility (the facility). The facility is located in the southeast and northeast 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 and Protected Areas (EPA), EPEA Approval No. 10348-03-01 (amending approval). This amending approval is effective as of June 21, 2022, and was recently amended to include the NE ¼ of Section 9, Township 50, Range 17, W4M in the defined facility area as per application 015-10348. The amending approval expires March 31, 2027. As per the renewed approval requirements, Tetra Tech submitted a revised Groundwater Monitoring Program (revised GMP) to EPA on behalf of Clean Harbors before December 31, 2022. The current GMP, previously authorized on May 25, 2018, has been implemented for the 2023 monitoring year and will be followed annually until Alberta EPA issues approval for the revised GMP. A copy of the Approval and an updated Record of Site Condition Form, are provided in Appendix A.

The objectives of the GMP were to provide an assessment of the groundwater flow conditions and quality compared to historical data and guidelines, comment on the results, and provide recommendations for future groundwater monitoring as required under the GMP. This report provides the methods and results of the 2023 GMP, which were conducted under the current (2018) GMP. The report content has been updated to include items identified as either non-compliant or with opportunity for improvement by Alberta EPA during a facility audit undertaken on May 4 and May 18, 2023.

The 2023 GMP findings are summarized as follows:

- The interpreted groundwater flow directions in surficial materials, upper sandstone, and clay shale are generally consistent with previous years.
- The natural groundwater type is sodium sulphate and natural mineralization accounts for high concentrations of sodium, sulphate, and total dissolved solids concentrations in the groundwater across the facility.
- Chloride concentrations at MW27B, installed in the upper sandstone have been measured greater than the guideline since 2021. Monitoring well MW27B is located south of Cell 3D and recorded chloride concentrations that rapidly increased from 2018 (49 mg/L) to 2022 (174 mg/L) before marginally decreasing in 2023 (173 mg/L and 164 mg/L in June and October, respectively). Increasing chloride concentrations may be related to surface water infiltration, local operational activity or monitoring well integrity issues. There are no other parameter trends noted at this well, and the chloride appears to be sodium chloride; it is interpreted to be more likely related to surface impact such as from road salt, rather than impact by leachate based on the absence of other indicators. The deeper monitoring well in this nest (MW27A) does not show indication of chloride, measuring 4.63 mg/L in 2023. Further assessment of the identified trends at MW27B is recommended below.
- In 2023, dissolved metals and routine parameters were generally within the historical concentration ranges and there continues to be no detection of volatile organic compound parameters analysed. In 2023, there was one petroleum hydrocarbon fraction F2 detection below the Tier 1 Guideline at monitoring well 15MW15-Deep which is not consistent with historical results, and all other concentrations of hydrocarbon parameters analysed in groundwater samples were below the detection limit. Naturally occurring hydrocarbons have been identified in deeper bedrock units at and in the vicinity of the site.

- Total phenol concentrations greater than laboratory detection limits have been present since 2018. In 2023, several wells had groundwater with concentrations of phenols above the laboratory detection limit.

Overall, there were no indications of adverse groundwater impacts resulting from facility activities with the exception of an increasing chloride trend noted at MW27B (upper sandstone unit). Based on the results from the work conducted in 2023, the following is recommended for Clean Harbors' consideration:

- The groundwater monitoring and sampling fieldwork should continue to be conducted in late May or early June to minimize the number of frozen wells and maximize groundwater availability for sampling.
- The geodetic elevations of monitoring wells 23MW38A and 23MW38B should be surveyed in 2023 to support groundwater contouring.
- The revised GMP has been submitted to Alberta EPA and is under review. The current GMP should be maintained until the revised GMP has been accepted by Alberta EPA. The exception to this is the monitoring and sampling of wells in the north quarter as part of the proposed baseline groundwater monitoring program which was accepted for implementation by Alberta EPA on July 13, 2023.
- Conduct further investigation in the vicinity of MW27B. This is proposed to include: a comprehensive evaluation of leachate chemistry and leak detection port sampling undertaken at adjacent cells; an assessment of well integrity with a camera inspection; further evaluation of surface activities and housekeeping adjacent to the well; and based on the outcome of those assessments, consideration of further investigation utilizing either geophysical means (electromagnetic survey) and/or drilling of additional boreholes targeting the surficial soils and upper sandstone units proximate to this location, if necessary.

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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 document is subject to the Limitations on the Use of this Document attached in Appendix G or Contractual Terms and Conditions executed by both parties.

1.0 INTRODUCTION

Clean Harbors Environmental Services Inc. (Clean Harbors) retained Tetra Tech Canada Inc. (Tetra Tech) to conduct the 2023 Groundwater Monitoring and Sampling Program (GMP) at the Ryley Landfill facility (the facility). The facility is located in the southeast and northeast 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 and Figure 2). 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 and Protected Areas (EPA), EPEA Approval No. 10348-03-01 (amending approval). This amending approval is effective as of June 21, 2022, and was recently amended to include the NE ¼ of Section 9, Township 50, Range 17, W4M in the defined facility area as per application 015-10348. The amending approval expires March 31, 2027. As per the renewed approval requirements, Tetra Tech submitted a revised Groundwater Monitoring Program (revised GMP) to EPA on behalf of Clean Harbors before December 31, 2022.

The current GMP, previously authorized on May 25, 2018, has been implemented for the 2023 monitoring year and will be followed annually until Alberta EPA issues approval for the revised GMP. A copy of the Approval and an updated Record of Site Condition Form, are provided in Appendix A.

This report provides the methods and results of the 2023 GMP, which were conducted under the current (2018) GMP. The report content has been updated to include items identified as either non-compliant or with opportunity for improvement by Alberta EPA during a facility audit undertaken on May 4 and May 18, 2023.

Stan Yuha, Facility Manager at Clean Harbors, provided Tetra Tech written authorization to proceed with this work on May 15, 2023.

1.1 Objectives

The objectives of the 2023 GMP were to:

- Provide an assessment of the groundwater flow conditions and groundwater quality at the facility and compare the results to historical data and applicable guidelines; and
- Comment on the results and provide recommendations for future groundwater monitoring programs.

1.2 Scope of Work

The scope of work for the 2023 GMP included:

- Monitoring and sampling the groundwater monitoring wells identified in the GMP (shown on Figure 3a), and submitting samples for laboratory chemical analyses of parameters as per the Approval (summarized in Table 1);
- Evaluating the groundwater flow conditions and quality, with comparison to historical results, knowledge of leachate composition, and regulatory guidelines; and
- Preparing an annual report that summarizes the field activities undertaken during the year, presenting the measured groundwater levels and groundwater analytical results, and providing an interpretation of the collected results.

Tetra Tech also conducts a sampling program of off-site dugouts in accordance with the Approval which is reported under a separate cover.

2.0 BACKGROUND INFORMATION

This section describes background information pertaining to local groundwater and surface water users including surface water drainage, geology, hydrogeology, and the existing groundwater monitoring network.

2.1 Groundwater Users

As required in Section 4.9.18(e) of the Approval, a search of water wells was conducted using the Alberta Water Well Information Database (EPA 2023). The results of the search and an evaluation of the wells identified are detailed in the 2023 Dugout and Water Well Monitoring Report (Tetra Tech 2024) with a summary given below.

The required search radius is 1.6 km; however, 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 showed water well records for 50 water wells drilled for different purposes as of September 2023. Forty-four (44) were considered to not require field verification (nor are suitable for sampling); rationale for elimination of the 44 wells included available well record details, age of installation, distance from the Ryley Facility, intended purpose and owner name (Tetra Tech 2024). Six (6) of the 50 water well records were identified to require field verification and to possibly be suitable for sampling. None of the six outstanding water well records investigated in the field resulted in monitoring or sampling as the well locations could not be confirmed/found or there was no response to either telephone calls or letters dropped off at the locations.

Further details on the well evaluation performed are included in the 2023 Dugout and Water Well Monitoring Report (Tetra Tech 2024). A Table and a Figure showing the results and locations of the water well search are included in Appendix B.

2.2 Surface Water Users

A map showing the locations of surface water users in a 2.0 km radius and a table containing the water allocation details are 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 the surface water sampling locations are reported under a separate cover (Tetra Tech 2024).

2.3 Surface Water Drainage

Surface water drainage patterns at the facility and surrounding the facility are shown on Figure 3b. Figure B-4 in Appendix B shows a broader radius, highlighting the number of sloughs in the area. Surface water management includes run-on prevention to divert water from flowing onto the facility, and runoff management comprising a series of ditches and retention ponds onsite.

The northwest corner of the historical cell area (i.e., Cell 1 and Cell 2) is a local topographic high point for surface water drainage. Ditches have been constructed around the waste cells to collect surface water and convey perimeter drainage to the east end of the site. For the closed cells, drainage is directed around the west and south sides of the site to the southeast corner, where it is conveyed northward to a culvert which directs runoff beneath Highway 854 to the Bible Creek drainage system. A widened ditch area (“hockey stick”) along the south perimeter

allows testing of runoff if required, prior to release. For the active cell areas, runoff is directed to a retention pond (Pond B) at the eastern end of the site. There are also retention ponds adjacent to the laydown area (Pond C) and adjacent to the holding area and north of Cell 4 (Pond D).

All surface water runoff is collected, tested to ensure it meets surface water quality discharge requirements, and then released to the east under Highway 854, to the channelized Bible Creek drainage course.

2.4 Geology and Hydrogeology

Various regional studies (HCL 1999; Stein & Carlson 2005) have compiled regional geology and hydrogeology of the area. The data gathered from various reports is presented visually in Appendix B as Appendix B-5 (Regional Geology), Appendix B-6 (Regional Water Wells), and Appendix B-7 (Regional Hydrogeology Groundwater Flow).

The regional geological information suggests 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; and grey and green mudstone (Stein & Carlson 2005., 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 not well defined. Together, these formations are estimated to be 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 B-5, and Figure B-7).

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. Figure B-7 in Appendix B shows the regional hydrogeology and groundwater flow. 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 natural groundwater in the bedrock contains concentrations of total dissolved solids (TDS) 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 on Figure 4b to Figure 4e. Borehole logs of the monitoring wells are presented in Appendix C.

2.5 Groundwater Monitoring Network

The 2023 GMP included 48 wells, which were monitored and/or sampled in June 2023. The locations of the existing monitoring wells are shown on Figure 3a.

The lithology beneath the site has been divided in four (4) hydro-stratigraphical units including Surficial Material, Upper Sandstone, Clay Shale, and Lower Bedrock. Table 2 shows the dates the monitoring wells were installed and the hydro-stratigraphic units of the well groupings. The well groupings are summarized in Table A.

Table A: Monitoring well Hydro-Stratigraphic Units

Wells	Hydro-Stratigraphic Unit
MW10, MW18B, MW19B, MW20B, MW21B, MW22B, MW29B, MW30B, MW31B, MW32B, MW33B, 15MW35C, 19MW37B (decommissioned June 27, 2023), and 23MW38B (installed December 19, 2023)	Surficial Materials
MW1C, MW8B, MW11, MW12A (decommissioned April 27, 2023), MW23B, MW25B, MW26B, MW27B, MW28B, MW29A, MW30A, MW31A, MW33A, and 15MW35B	Upper Sandstone
MW1B, MW8A, MW12B (decommissioned June 27, 2023), MW18A, MW19A, MW20A, MW21A, MW22A, MW23A, MW25A, MW26A, MW27A, MW28A, MW32A, 15MW35A, and 15MW36A, 19MW37A (decommissioned June 27, 2023), and 23MW38A (installed December 19, 2023)	Clay Shale
15MW35-Deep and 15MW36-Deep	Lower Bedrock

In addition to the wells mentioned in Table A, 15 monitoring wells were installed in 2016 in the adjacent quarter section north of the facility as part of an application to expand the facility. Baseline monitoring and sampling at these wells was conducted in 2016 and 2017 (Tetra Tech 2021), and in 2023 (not yet reported); the results of the ongoing baseline monitoring program will be incorporated into the pre-operations baseline Technical Memorandum to be issued in 2024.

Monitoring wells 19MW38A and 19MW38B were decommissioned in October 2022 due to active construction in the vicinity of the wells for the new waste receiving pad. As stipulated in the 2022 annual GMP report (Tetra Tech 2023), replacement wells 23MW38A and 23MW38B were installed within the same lithology and as close as possible to 19MW38A and 19MW38B, as allowed by site conditions, and sampled in 2023.

Monitoring wells MW12A, MW12B, 19MW37A, and 19MW37B were decommissioned in 2023 due to active construction in the vicinity of the wells for Cell 5. The revised GMP submitted to Alberta EPA in December 2022 (Tetra Tech 2022) stipulated that wells MW12A, MW12B, 19MW37A, and 19MW37B would require decommissioning in 2023 and that because the wells will no longer be in a position where they could be points of compliance, they were not proposed to be replaced. In a letter dated June 6, 2023, Alberta EPA approved the “plan for decommissioning and replacing the monitoring wells [that] was included in [the revised GMP]” (Alberta EPA 2023).

Additional wells were installed in the vicinity of Cell 5, which will form part of the compliance network once that cell is in operation (2024), and which will form part of a revised northern compliance boundary.

3.0 METHODS

This section provides details of the field work methods related to groundwater monitoring and sampling (Section 3.1), changes to the program in 2023 (Section 3.2) and comparative guidelines used to evaluate the results (Section 3.3).

3.1 Groundwater Monitoring and Sampling

Tetra Tech personnel followed environmental industry accepted practices to ensure that representative groundwater samples were obtained for analysis. This included Tetra Tech work methods WM4212 (Manual Water Level Measurement) and WM4203 (Groundwater Sample Collection).

Monitoring wells MW12A, MW12B, 19MW37A, and 19MW37B were arranged to be sampled on May 15, 2023, in anticipation that the wells would need to be decommissioned before the June sampling event. Monitoring wells 23MW38A and 23MW38B were sampled on December 21, 2023, following their installation. Monitoring and sampling of the remainder of the monitoring well network was conducted between June 14 and June 16, 2023. Field staff completed the following field activities and data collection processes:

- Prepared Health & Safety Plan for the work.
- Checked the integrity and stability of each well before monitoring and sampling. Performed minor repairs if necessary or noted deficiencies.
- Measured and recorded static groundwater levels in each well using an interface probe.
- Purged groundwater from each monitoring well by removing three well volumes, or until the monitoring well was practically dry, using either dedicated bailers or Waterra tubing with a foot valve.
- Recorded the volume of groundwater removed from the well, and a description of the groundwater purged (colour, ambient odour, sediment, volume etc.).
- Recorded field measured parameters including electrical conductivity (EC), pH, and temperature using a multi-meter probe.
- Allowed groundwater levels in wells to recover to sufficient levels in order to obtain representative samples.
- Collected groundwater samples with equipment used to purge the well. Deep monitoring wells 15MW35-Deep and 15MW36-Deep were not purged before sampling.

Groundwater samples were collected in laboratory-supplied containers, field filtered and/or appropriately preserved as required, stored in coolers with ice to keep sample temperature below 4°C throughout the fieldwork, and submitted to ALS Laboratories (ALS), in Edmonton, Alberta under chain-of-custody (COC).

A total of 54 samples were submitted including:

- Forty-seven (47) groundwater samples from wells were submitted out of the forty-eight (48) wells in the analytical schedule (Table 1). A full analytical suite was not collected from the following monitoring wells due to the following reasons:
  - MW12A – On April 27, 2023, the well was found to be irreparably compromised by activities associated with the Cell 5 construction project. The well casing also appeared to be partially removed from the ground meaning that even if a sample could be taken from the damaged casing, the screened zone of the well would have potentially been in a different lithology. Therefore, the well was not sampled and was decommissioned on April 27, 2023.
  - 15MW35A – Limited water in the well at the time of sampling. Field parameters could not be recorded but all parameters were sampled.
- Four duplicate sets of samples from monitoring wells MW1B (Dup-A), MW21B (Dup-B), 15MW36A (Dup-C), and MW28A (Dup-D).
- One Trip Blank.
- One Field Blank.

Samples were analyzed for the following parameters as required by the Approval and GMP and as indicated in Table 1 (attached):

- Routine water chemistry (major ions) including pH, EC, TDS, alkalinity, hardness (as $CaCO_3$), chloride, calcium, magnesium, sodium, potassium, sulphate, nitrate, and nitrite.

- Dissolved metals (including dissolved mercury).
- Nutrients (Total Kjeldahl Nitrogen [TKN] and ammonia).
- Chemical oxygen demand (COD).
- Dissolved organic carbon (DOC).
- Benzene, toluene, ethylbenzene, and xylenes (BTEX) and petroleum hydrocarbon (PHC) fractions F1 and F2.
- Total phenols.
- Volatile Organic Compounds (VOCs) including methylene chloride, vinyl chloride, trichloroethylene (TCE), and tetrachloroethylene (PCE) (Note: a more comprehensive VOC suite was tested in 2023, however, only the noted four compounds are part of the GMP).

3.2 Summary of Changes to Well Network and Analytical Program

The following summarizes changes made to the groundwater monitoring well network and analytical program in 2023.

3.2.1 Monitoring Well Network Changes

Changes made to the monitoring well network, either by decommissioning or installing wells, are discussed below. The work was described in the revised GMP currently under review by Alberta EPA. In a letter dated June 6, 2023, Alberta EPA approved the “plan for decommissioning and replacing the monitoring wells [that] was included in [the revised GMP]” (Alberta EPA 2023).

3.2.1.1 Monitoring Wells Decommissioned in 2023

Tetra Tech personnel supervised the decommissioning of monitoring wells MW12A on April 27, 2023, and MW12B, 19MW37A, and 19MW37B on June 27, 2023, due to their location being in the way of landfill construction activities for Cell 5. Clean Harbors retained a driller within the Clean Harbors family of companies to remove surface casing and associated well piping from the hole. All piping (PVC or stainless steel) was removed and then the holes were backfilled with bentonite to surface. If the hole sloughed, either after redrilling the hole or after removing the pipe, bentonite was forced to depth by reversing the direction of augers in the hole and pouring bentonite chips against the augers at the surface. The number of bentonite bags used to fill each hole was used to verify that the hole had been filled completely. The decommissioning details are included in Table B.

Tetra Tech staff completed the following field activities and data collection process:

- Supervised the drillers during decommissioning tasks; and
- Recorded field notes of methods used for decommissioning and observations.

Table B: Monitoring Well Decommissioning Details

Well	Decommissioning Method	Total Depth Backfilled	Backfill Material
MW12A	Stainless steel pipe was pulled out of hole. Hole remained open and was backfilled to depth.	6.0 m	Bentonite
MW12B	Stainless steel pipe was pulled out of hole. Auger was used to force backfill to depth.	10.7 m	Bentonite
19MW37A	PVC pipe was pulled out of hole. Auger was used to force backfill to depth.	13.4 m	Bentonite
19MW37B	PVC pipe was pulled out of hole. Hole was redrilled to depth and backfilled.	4.9 m	Bentonite

3.2.1.2 Monitoring Wells Installed in 2023

Monitoring wells 23MW38A and 23MW38B were installed on December 19, 2023, to replace 19MW38A and 19MW38B which were previously decommissioned in 2022. The replacement of these wells in 2023 was outlined in the 2022 Annual Report (Tetra Tech 2023). Borehole logs for 23MW38A and 23MW38B are included in Appendix C.

Seven wells were also installed north of the original site as part of the north quarter baseline monitoring program in 2023. Further details of these installations will be included in pending reporting for the baseline monitoring program. Several of these will form part of the future compliance network (inclusive of Cell 5 becoming active) as described in the proposed GMP.

3.2.2 Analytical Program Changes

Changes or differences between the 2022 sampling program and the 2023 sampling program are noted below for each relevant well:

- MW12A – On April 27, 2023, the well was found to be irreparably compromised by activities associated with the Cell 5 construction project. The well casing also appeared to be partially removed from the ground meaning that even if a sample could be taken from the damaged casing, the screened zone of the well would have potentially been in a different lithology. Therefore, the well was not sampled and was decommissioned on April 27, 2023.
- 15MW35A – Limited water in the well at the time of sampling. Field parameters could not be recorded but all laboratory parameters were sampled and tested.
- 23MW38A – Installed on December 19, 2023, to replace 19MW38A, previously decommissioned in 2022, and sampled on December 21, 2023, as stipulated in the 2022 Annual Report (Tetra Tech 2023).
- 23MW38B – Installed on December 19, 2023, to replace 19MW38A, previously decommissioned in 2022, and sampled on December 21, 2023, as stipulated in the 2022 Annual Report (Tetra Tech 2023).

3.3 Data Evaluation

Until 2018, groundwater analytical results were compared to the Canadian Environmental Quality Guidelines (CEQG) for drinking water, updated in September 2022 and published by Health Canada, as per Section 4.9.11 of the Approval. Based on the revised GMP issued in 2018, subsequent results have been compared to Alberta's Tier 1 Soil and Groundwater Remediation Guidelines (Tier 1 Guidelines) for fine-grained material under agricultural land use (EPA 2022). The surficial soils and bedrock material in the area are primarily fine-grained (clay till, overlaying shale bedrock) and surrounding land use is primarily agricultural with other industrial land uses to the east. Results have also been evaluated relative to historical testing at the site with focus on potential trends or changes in water quality which may be a result of site operations.

4.0 RESULTS

Section 4.1 and Section 4.2 describe the groundwater levels and interpreted flow, and the groundwater chemistry results, respectively. The results of quality assurance and quality control (QA/QC) testing are described in Section 4.3.

4.1 Groundwater Flow Conditions

The lithology beneath the site is divided into four hydro-stratigraphic units; surficial material, upper sandstone, clay shale, and lower bedrock. Table 3a to Table 3d summarize the water levels for 2023 by hydro-stratigraphic group. 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 5a through Figure 5g. The groundwater elevations measured in 2023 are generally consistent with historical groundwater elevations with the following observed visual trends by water bearing layer:

- Surficial Material (Figure 5a and Figure 5b) – Groundwater elevations at monitoring wells MW18B, MW20B, and MW22B on the west side of the facility decreased relative to 2022 elevations; however, they were within historical ranges in 2023. Groundwater elevations in monitoring wells, MW30B, MW31B, and MW32B on the east side of the facility decreased relative to 2022 elevations, except for MW29B; however, they remained within historical ranges.
- Upper Sandstone (Figure 5c and Figure 5d) – Groundwater elevations in 2023 decreased from 2022 and were mostly within historical ranges, except for MW8B and MW33A, where elevations increased to historical highs for each well.
- Clay shale (Figure 5e and Figure 5f) – Groundwater elevations in 2023 were generally similar to historical elevations. The groundwater elevation at MW8A decreased from a historical high in 2022 to within historical ranges in 2023.
- Lower Bedrock (Figure 5g) – Groundwater elevations in 2023 were consistent with historical ranges.

In general, the surficial materials and upper sandstone show the greatest variation over time, with more stable levels noted in the deeper clay shale and lower bedrock units.

Groundwater elevations measured during the 2023 monitoring event were contoured using Surfer Mapping System Version 16. Groundwater elevation contours were created by grouping wells within the same water bearing units, and interpolating groundwater elevation data between wells. Professional judgement was applied to ensure that the information presented in the figures is reasonably applicable given site history and known hydrogeological conditions.

Figure 6a through Figure 6c show groundwater flow directions in three geologic units beneath the site including surficial material, upper sandstone, and clay shale. Figure 6d shows the groundwater elevations recorded in wells screened in the lower bedrock; however, contours have not been interpreted because the groundwater elevations at wells in the north quarter were recorded greater than one month before wells on site. The 2023 groundwater flow patterns in all units beneath the site were similar to historical patterns and are discussed below.

- Figure 6a shows the interpreted groundwater elevation contours for the clay till (surficial) unit. Bottom of screen depths range from 3.22 mbgl to 5.95 mbgl. Groundwater in this unit flows to the east on the east side of the site and towards the north and south on the west side of the site, which is generally consistent with historical measurements. It is likely that groundwater flow through this unit is discontinuous across the facility due to the depth of the landfill cells and above and below ground infrastructure. Based on the 2023 groundwater monitoring information, the average depth to groundwater in the surficial materials was 1.86 mbgl.

- Figure 6b shows the 2023 groundwater elevation contour map for the upper sandstone unit. This unit is likely laterally continuous across the facility. Bottom of screen depths in this unit range from 3.57 mbgl to 14.77 mbgl, although, with the exception of MW33A, are generally less than 9.5 mbgl. There appears to be a divide in groundwater flow direction in this unit near the centre of the facility. Groundwater flow direction in the eastern half of the facility is to the southeast. In southwest corner of the site the groundwater flow direction is to the southwest. In the northwest (MW1C) the water level is lower suggesting there could also be a northwest component in that area of the site. While flow is generally consistent with prior years, periodic changes in flow have been observed which may be a result of site development activities.

- Figure 6c shows the 2023 groundwater elevation contour map for the clay shale unit. This material is interpreted to be laterally continuous in wells across the facility. Bottom of screen depths range from 9.24 mbgl to 15.20 mbgl. In 2023, the groundwater flow direction across site was interpreted to be towards the east on the east side of site and towards the southwest in the southwestern area of site and northwest in the northwestern corner of the site. The interpreted flow is generally consistent with historical monitoring.

- Groundwater elevations are measured in monitoring wells 15MW35-Deep and 15MW36-Deep which are screened within the Belly River Formation, which is referred to as “Lower Bedrock”. Well depths in this zone range from 32.59 mbgl to 34.64 mbgl. The elevations in 2023 were similar to elevations in 2022. The two northern wells (16MW11A and 16MW09A) were monitored a month earlier as part of a baseline monitoring event and have been included for reference. The elevations were not contoured with the wells at the south portion due to the difference in monitoring dates.

Calculated vertical and horizontal hydraulic gradients based on 2023 groundwater elevations are reported in Table C and Table D below, respectively.

Table C: Vertical Hydraulic Gradients

Wells	Vertical Groundwater Flow Direction
MW1B/MW1C, MW8A/MW8B, MW20A/MW20B, MW21A/MW21B, MW22A/MW22B, MW23A/MW23B, MW26A/MW26B, MW28A/MW28B, MW29A/MW29B, and MW30A/MW30B MW31A/MW31B, MW33A/MW33B, 15MW35A/15MW35B, 15MW36-Deep/MW36A	Downward
MW18A/MW18B, MW19A/MW19B, MW25A/MW25B, MW27A/MW27B, MW32A/MW32B	Upward

The vertical gradient at MW28A/B in 2023 was effectively neutral. No survey data is available for 19MW37A/19MW37B and therefore, the wells were not included in the gradient calculations.

Table D: Horizontal Hydraulic Gradients

Hydro-stratigraphic Unit	Horizontal Hydraulic Gradient (m/m)
Surficial Material	0.003 to 0.01
Upper Sandstone	0.001 to 0.006
Clay Shale	0.006 to 0.02
Lower Bedrock	Not calculated

4.2 Groundwater Chemistry

Table 4a to Table 4d summarize the laboratory analytical results from 2016 to 2023. Parameters with concentrations greater than the Tier 1 Guidelines or outside of the guideline range are shaded in Table 4a to Table 4d. Laboratory certificates of analysis are presented in Appendix D. Historical chemistry results are contained in Appendix E. Concentration trend graphs for select parameters are provided in Appendix F.

The three nested wells 15MW35A/B/Deep are located to the southwest of the site and are considered to represent background groundwater conditions; while not hydraulically up-gradient, the nest is at a relatively greater distance and exhibits compound concentrations similar to that seen in baseline sampling in the quarter section north of the active facility. Groundwater from these monitoring wells generally has an average sulphate concentration of approximately 3,590 mg/L in the upper sandstone unit and concentrations from 10 mg/L to 50 mg/L in the deeper units. Chloride concentrations in the background wells increase with depth; the upper sandstone chloride concentrations averaged approximately 6.6 mg/L, the clay shale 38 mg/L and the deeper bedrock 1,418 mg/L. These chloride concentrations are interpreted to be naturally occurring.

The 2022 groundwater results for monitoring well 15MW35A are considered anomalous when compared to past results and results from 2023. The data is not considered to be representative and has therefore been removed from the discussion and interpretation for this report.

As with previous years, groundwater data collected in 2023 from the site overall shows a moderate to high degree of mineralization, likely caused by concentrations of sodium, sulphate, and TDS in native soils. The parameters exceeding the Tier 1 Guidelines and other key parameters are discussed in the following Table E. For many of these parameters, a figure is referenced in Appendix F which shows graphically concentration trends.

Table E: 2023 Analytical Results Summary for Select Parameters

Parameter	Tier 1 Guideline	Concentrations Measured in 2023	Wells greater than Tier 1 Guideline Value in 2023	Comments
Sodium Appendix F1	200 mg/L	340 - 3,860 mg/L	All wells sampled for sodium	▪ Sodium concentrations have generally remained within historical ranges, except for MW11 which in 2023 recorded a historical high for the well (3,860 mg/L). No notable trends are observed.
Chloride Appendix F2	100 mg/L	2.94 – 1,420 mg/L	MW27B, MW32B, 15MW35-Deep, and 15MW36-Deep	▪ Chloride concentrations have remained within historical ranges at most wells. ▪ Chloride concentrations in monitoring wells MW18B and MW32B showed increasing trends between 2014 and 2020, and 2015 and 2021, respectively. Chloride concentrations at MW32B have been greater than the referenced guideline since monitoring began at this well in 2015. Chloride concentrations at MW32B increased in 2023, but they remained below the well's historical high recorded in 2021. Concentrations at MW18B have continued to decrease since the high in 2020. ▪ Chloride concentrations at MW27B have shown an increasing trend since 2015 with concentrations exceeding the guideline since 2021. In 2023, chloride concentrations at MW27B decreased marginally from 2022, but remained above the guideline. ▪ 15MW35-Deep, and 15MW36-Deep have the highest chloride concentrations onsite, with a slight concentration decrease in 2023 from 2022. ▪ Modest increasing trends have been observed in monitoring wells MW8B and MW11; however, concentrations have remained less than the guideline.
Nitrate Appendix F3	3.0 mg/L	<0.010 – 11.20 mg/L	MW22A	▪ Visual trends show monitoring well MW22A has been consistently exceeding the guideline since 2006 and spiked to 70 mg/L in 2017 with a single anomalous result; however, concentrations decreased to within historical range from 2018 to 2023 with no obvious further trends. ▪ Nitrate concentrations appear to have spiked in multiple wells in 2017. Concentrations decreased to pre-2017 ranges in 2018 and have remained within the range until present.
Fluoride	1.0 mg/L	<0.40 – 1.68 mg/L	MW1B, MW18A, MW23A, MW31A, MW33A, 15MW35A, 15MW36A, and 23MW38A	▪ Fluoride concentrations exceeded the applicable guideline at multiple wells in 2023 (shale and upper sandstone); however, concentrations were within their historical ranges for each well.
Sulphate Appendix F4	128 – 429 mg/L (Guideline varies with hardness)	0.32 - 6,910 mg/L	All wells sampled for sulphate except MW18A, MW21A, MW23A, MW25A, MW31A, MW33A, 15MW35A, 15MW35-Deep, 15MW36A, and 15MW36-Deep	▪ Sulphate concentrations have remained within historical ranges at most wells. Most monitoring wells had a marginal decrease in sulphate concentrations in 2023, compared to 2022 concentrations. ▪ The sulphate concentration at well MW20B in 2023 was the highest measured to date (3,660 mg/L).
TDS, Appendix F5	500 mg/L	948 – 11,400 mg/L	All wells sampled for TDS	▪ TDS concentrations have generally remained within historical ranges at most monitoring wells. ▪ Wells 15MW35-Deep, and 15MW36-Deep show stable concentration visual trends in 2023. ▪ The TDS concentration at well MW20B in 2023 was the highest measured to date (5,930 mg/L).
pH (Laboratory), Appendix F6	6.5 – 8.5	8.10 – 9.04	MW1B, MW8A, MW8B, MW18A, MW19A, MW19B, MW20A, MW21B, MW22A, MW23A, MW25A, MW26A, MW27A, MW28A, MW29A, MW30A, MW31A, MW31B, MW33A, 15MW35A, 15MW35-Deep, 15MW36A, 15MW36-Deep, and 23MW38A	▪ Laboratory pH values have remained within historical ranges, no notable trends are observed. Field pH values overall show a similar visual trend with some wells increasing or decreasing trends, but generally remaining within historical range.
pH (Field), Appendix F7		7.49 – 9.06	MW1B, MW19B, MW23A, MW33A, 15MW36A, and 23MW38A	
Dissolved Aluminum	0.007 – 0.050 mg/L (Guideline varies with pH)	<0.0050 – 0.256 mg/L	MW12B and 19MW37A	▪ Dissolved aluminum concentrations have generally remained within historical ranges at most wells, no notable visual trends were observed. ▪ Dissolved aluminum at MW12B was the greatest concentration measured to date. 23MW37A recorded a marginal exceedance of dissolved aluminum in 2023 (0.03 mg/L), although the concentration was within historical ranges. Both wells noted are in the clay shale.
Dissolved Cadmium	0.00004 – 0.00037 mg/L (Guideline varies with hardness)	<0.0000050 – 0.0000578 mg/L	15MW35A	▪ Historically, dissolved cadmium concentrations at 15MW35A have been less than the analytical detection limit. The dissolved cadmium exceedance recorded at the well in 2023 is a record high concentration for the well.
Dissolved Copper	0.007 mg/L	<0.0010 – 0.0315 mg/L	15MW35A	▪ The dissolved copper concentration recorded at 15MW35A in 2023 (0.0315 mg/L) exceeded the guideline (0.007 mg/L) and increased from its first recorded exceedance in 2022 (0.0143 mg/L).

Parameter	Tier 1 Guideline	Concentrations Measured in 2023	Wells greater than Tier 1 Guideline Value in 2023	Comments
Dissolved Iron Appendix F8	0.3 mg/L	<0.050 – 0.235 mg/L	None	▪ Dissolved iron concentrations have generally remained within historical ranges. ▪ Some isolated spikes in dissolved iron concentrations have been observed; however, no increasing dissolved iron concentration visual trends are observed.
Dissolved Manganese Appendix F9	0.05 mg/L	<0.004 – 0.697 mg/L	All wells sampled for manganese except for MW11, MW18A, MW19B, MW20B, MW21B, MW22B, MW23A, MW26A, MW27A, MW27B, MW28A, MW30A, MW33A, 15MW35A, and 23MW38A	▪ Dissolved manganese concentrations across the facility appear to be generally stable and within historical ranges. ▪ Dissolved manganese concentrations at 15MW35-Deep and 15MW36-Deep decreased in 2023 from historical highs recorded at each well in 2022. ▪ Monitoring well MW31B recorded its highest dissolved manganese concentration in 2023 after recording a concentration below the analytical detection limit in 2022.
Dissolved Selenium	0.002 mg/L	<0.00020 – 0.0682 mg/L	MW20B	▪ Dissolved selenium concentrations at MW20B have exceeded the referenced guideline since 2020. The dissolved selenium exceedance at MW20B in 2023 is decreased from the 2022 exceedance.
Dissolved Uranium	0.01 mg/L	<0.0001 – 0.0533 mg/L	MW11, MW12B, and MW20B	▪ The dissolved uranium concentration at monitoring well MW20B decreased from the historical high recorded in 2022. Concentrations at the well have remained above the guideline since 2020. ▪ MW11 and MW12B have had consistent concentrations of dissolved uranium greater than the guideline; however, no trend has been observed. The dissolved uranium concentration recorded at MW11 increased to a historical high in 2023 (0.045 mg/L) from 2022 (0.031 mg/L).
Ammonia Appendix F10	0.018-190 mg N/L (Guideline varies with pH and temperature)	<0.0050 – 3.76 mg-N/L	MW8A, MW12B, MW18A, MW19A, MW19B, MW23A, MW25A, MW27A, MW28A, MW28B, MW29A, MW31A, MW32A, MW33A, 15MW35A, 15MW35B, 15MW36A, 19MW37B, 15MW35-Deep, and 15MW36-Deep	▪ Ammonia concentrations have generally remained within historical ranges for each well with no notable trends observed for most wells. ▪ Historical highs of ammonia were recorded at MW1C, MW19A, MW19B, MW21A, MW23A, MW25A, MW26A, MW28B, MW32A, MW32B, 19MW37A, 19MW37B in 2023 with slight upwards trends noted at MW25A and 19MW37B.

BTEX, Styrene, and PHC fraction F1 and F2 concentrations were not detected in all wells in 2023 with the exception of a detectable PHC F2 concentration at 15MW35-Deep. The concentration (0.28 mg/L) was greater than the detection limit, but less than the applicable Tier 1 guideline (1.1 mg/L). Well 15MW35-Deep has not previously recorded a detection of PHC F2 and the measurement should be confirmed in 2024. Concentrations of VOCs were not detected at any wells.

There are no Tier 1 Guidelines for total phenols concentrations. Detectable concentrations of total phenols were observed in MW8A, MW12B, MW19A, MW21A, MW21B, MW22A, MW23A, MW25A, MW28B, MW29A, 15MW35A, 19MW37A, and 19MW37B. Previously, total phenols were detected at most wells in 2021 before reducing to below the analytical detection limit in 2022. This is consistent with historical results and no obvious trends are noted.

There are no Tier 1 Guidelines for TKN, COD, or DOC. The table below summarizes the results of these parameters in 2023. No notable increasing visual trends have been observed for any of the parameters listed below and most results are within historical ranges.

Table F: TKN, COD, and DOC Summary

Parameter	Maximum Concentration (mg/L)	Monitoring Well	Minimum Concentration (mg/L)	Monitoring Well	Average in All Wells (mg/L)
TKN, Appendix F11	4.45	15MW35A	0.12	MW26A	1.39
COD, Appendix F12	197	15MW35A	17	MW20A	50
DOC, Appendix F13	42.3	MW33B	6.22	MW22B	14.2

4.3 Quality Assurance and Quality Control

To verify water sample integrity a trip blank and a field blank sample were used. A trip blank sample is prepared in a laboratory with clean sample matrix and travels in the same cooler as the sample bottles, to and from the sample sites. They are used to determine if contamination is introduced from the bottle itself or from conditions during transport. Field blanks are similar to trip blanks but are opened and handled as a regular sample. This shows any contamination from bottles, collection methods, atmosphere, and chemical preservatives.

ALS commented on sample quality items in the laboratory report. Upon receiving the samples, some sample coolers exceeded the ALS recommended hold time for nitrate, nitrite, total mercury, and total metals. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised or invalid (Appendix D). ALS also indicated that pH by meter had exceeded the recommended hold time; however, these readings were taken in the field by Tetra Tech staff during sampling.

To evaluate field sampling reproducibility, duplicate groundwater samples were collected during the sampling event in 2023. Duplicates were collected from MW1B (Dup-A), MW21B (Dup-B), MW36A (Dup-C), and MW28A (Dup-D) 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 to pass the QA/QC reproducibility procedure if the RPD was less than or equal to 20%, 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 the MDL value.

The RPD calculations are summarized in Table 5a. These results indicate that all the parameters had RPD less than 20% except the following listed in Table G:

Table G: Parameters with RPD greater than 20%

MW1B and Dup-A	MW21B and Dup-B	MW36A and Dup-C	MW28A and Dup-D
Nitrate = 30% Dissolved Aluminum = 77%	Ammonia = 33% Dissolved Boron = 43%	None	Dissolved Cesium = 20% Dissolved Silicon = 20% Dissolved Sulphur = 23%

Greater RPD values for dissolved parameters aluminum, boron, cesium, silicon, and sulphur may be caused by incomplete filtration. Some nutrient parameters had RPD values greater than 20% which may be a result of preservation and hold time of the sample. These results will be confirmed in the spring of 2024.

Field Blank and Trip Blank results are summarized in Table 5b. These results indicate all parameters had less than detectable limits except for the following listed in Table H.

Table H: Detection Value Exceedances

Field Blank	Trip Blank
pH = 5.18 TDS = 4.6 mg/L Chloride = 0.255 mg/L DOC = 4.21 mg/L Dissolved Copper = 0.00035 mg/L Dissolved Silicon = 0.070 mg/L	pH = 5.17 Chloroform = 0.0013 mg/L

Detectable metal concentrations in the field blank are generally at concentrations near to the detection limits for each parameter and are not considered to be indicative of a larger quality or sample integrity issue.

Lower than neutral pH values are typical of de-ionized and de-natured water used in the field and trip blanks. This is due to the distilled water used in the field blank preparation process readily dissolving carbon dioxide from the air during distillation, sample collection, and sample analysis; because distilled water is poorly buffered, dissolution of carbon dioxide, will naturally lower the pH. The laboratory pH being less than the guideline for the field blanks does not indicate quality issues.

The chloride detection in the field blank remained below the reportable detection limit and was of a magnitude (less than 0.5 mg/L) which is not considered to be indicative of a larger quality or sample integrity issue. The concentration of the VOC chloroform in the trip blank (0.0013 mg/L) was marginally greater than the reportable detection limit (0.001 mg/L). The detection may be due to ambient chloroform in the laboratory where the trip blank was prepared as chloroform is commonly used as an organic solvent.

The 2023 QA/QC results for the parameters listed above were similar to historical results. The precision and accuracy of the laboratory analytical system was considered acceptable in 2023 for utilizing all data.

5.0 DISCUSSION

Groundwater quality at the background monitoring wells 15MW35B, and 15MW35-Deep have a high degree of natural mineralization showing elevated concentrations for sodium, sulphate, and TDS, which are greater than the Tier 1 Guidelines. All wells in the monitoring network exhibit evidence of groundwater mineralization (sodium, sulphate, TDS, and dissolved uranium). This is consistent with the chemical quality of shallow groundwater in the area (Stein et al. 2005), and the background wells. Clean Harbors is currently conducting a concurrent baseline monitoring program as part of the expansion to the north quarter which shows similar high mineralization; in 2024 that baseline program is proposed to become part of the overall GMP.

Sulphate and TDS concentrations are greater than Tier 1 Guidelines at many of the monitoring wells on site. Elevated concentrations of TDS are primarily caused by the elevated sulphate concentrations. Sulphate is often naturally occurring in groundwater, and elevated concentrations are not suspected to be caused by on site activities. In 2023, concentrations of sulphate increased at MW20B relative to 2022 concentrations and reached a new historical high for the well. In 2023, concentrations of sulphate were within historical ranges at most wells with most concentrations decreasing in 2023 from 2022 concentrations. Sulphate concentrations at MW32B increased in 2023 from 2022 but remained less than the historical high recorded in 2021.

Chloride concentrations have remained stable at most wells on site since monitoring began in 1996. Wells MW8B, MW10, MW11, MW18B, MW27B, and MW32B have historically displayed increasing trends since monitoring began at each well:

- In the surficial materials, MW32B has concentrations greater than guidelines. MW32B is located on the eastern side of the site, north of the retention pond (Pond B). The 2023 chloride concentration at MW32B increased from 2022 but remained within its historical range. Monitoring well MW18B is located near the western boundary of the site by a dugout and after an historical high in 2020 (130 mg/L) the concentrations have reduced and were within historical ranges in 2023 (28.4 mg/L). The proximity of this well to the dugout may lead to more variable results if there is any hydraulic connection to the surface water source. MW10, also in the surficial materials and within the main facility area exhibited a high in 2010 (140 mg/L) and subsequently reduced and has been stable, measured at 68.4 mg/L in 2023.
- In the upper sandstone, MW27B has had notable results and has been measured at concentrations greater than the guideline since 2021. Monitoring well MW27B is located south of Cell 3D and recorded chloride concentrations that rapidly increased from 2018 (49 mg/L) to 2022 (174 mg/L) before marginally decreasing in 2023 (173 mg/L and 164 mg/L in June and October, respectively. Increasing chloride concentrations may be related to surface water infiltration, local operational activity, or monitoring well integrity issues and further localized investigation is recommended, as described in Section 6.0. There are no other parameter trends noted at this well, and the chloride appears to be sodium chloride; it is interpreted to be more likely related to surface impact such as from road salt, rather than impact by leachate based on the absence of other indicators. The deeper monitoring well in this nest (MW27A) does not show indication of chloride, measuring 4.63 mg/L in 2023. Other nearby wells in this unit, MW8B and MW11 exhibited an increase until 2020 and have been stable since, measuring 50.9 mg/L and 56.3 mg/L respectively, in 2023.

- In recent years MW8B, MW10, and MW18B have remained less than their respective historical highs in 2020, 2015, and 2020, respectively. Monitoring wells MW8B and MW11 are located in the northwest corner of the site and chloride concentrations at each well have increased overall since 2013 and 2014, respectively.
- The bedrock monitoring wells continue to have the highest chloride concentrations measured onsite, ranging between 1,070 mg/L to 1,420 mg/L in 2023, in line with historical results and natural conditions.

Most wells at the site are indicative of suboxic or anoxic groundwater conditions as evidenced by relatively higher manganese and presence of ammonia at many locations. The ammonia is interpreted to be naturally occurring in the local sediment, potentially related to coal; it is therefore less useful as a potential indicator compound for leachate. At MW22A which is located south of Cell 3A and Cell 3B, oxic conditions appear to prevail based on nitrate concentrations that have been recorded greater than the Tier 1 Guideline, except for spring 2005 and 2006. A sudden increase in nitrate concentration at MW22A in 2017 is interpreted to be anomalous. All wells monitored in 2017 showed increased nitrate concentrations which have since decreased back to pre-2017 concentrations. All other wells onsite had nitrate concentrations less than the referenced guidelines in 2023.

Historically, pH values have been slightly greater or marginally less than the upper guideline value at the facility. It is likely that pH is naturally elevated in the area. Fluoride also appears to be naturally elevated at several locations; it is known to exceed guideline values in both shallow and deeper formations; there is no apparent special pattern relative to site activities, and no evidence of trends in the data.

Dissolved iron concentrations were less than the referenced guideline of 0.3 mg/L at all wells sampled in 2023. Since 2015, dissolved iron concentrations at well MW33B have fluctuated and have exceeded the guideline in previous years. Dissolved manganese has only been analyzed since 2015 and concentrations have historically exceeded the Tier 1 Guideline at most wells. Most wells recorded dissolved manganese concentrations greater than the guideline in 2023; however, the concentrations were within historical ranges. Dissolved manganese at deep wells 15MW35-Deep and 15MW36-Deep previously displayed increasing trends since 2018; however, concentrations decreased to within historical ranges at both wells from historical highs recorded at each respective well in 2022. Manganese and iron concentrations are often greater than the guideline in groundwater under suboxic or anoxic conditions and are considered to be naturally occurring.

Dissolved metals concentrations of aluminum, cadmium, and copper exceeded the Tier 1 Guideline at MW12B and 19MW37A (aluminum and cadmium), and 15MW35A (copper). Aluminum has a limited solubility at near neutral pH values. Therefore, in a sample that has been properly field-filtered using a 0.45 µm pore diameter filter, dissolved aluminum concentrations in groundwater are typically near or less than the analytical detection limit. The dissolved aluminum exceedances recorded at MW12B and 19MW37A are interpreted to be due to incomplete field filtration or wind-blown dust. The dissolved copper exceedance recorded at 15MW35A may similarly be due to incomplete filtration as indicated by the well's elevated dissolved aluminum concentration, but this should be confirmed during future events.

Dissolved uranium was reported as being in exceedance of the guideline (0.01 mg/L) at monitoring wells MW11, MW12B, and MW20B in 2023. Monitoring well MW20B also recorded a dissolved selenium exceedance in 2023. From 2019 to 2022, dissolved selenium and uranium concentrations at MW20B showed an increasing trend, but concentrations decreased in 2023 from 2022. The exceedances at the other wells have historically remained within the historical ranges for each well, but the dissolved uranium concentration at MW11 increased slightly in 2023 to a record high at the well. Dissolved selenium and uranium are considered to be naturally occurring in surface waters and groundwater in Alberta within glacial till deposits (CCME 2007).

All VOC parameters analyzed to date have been less than detection or less than guideline across the site. Most PHC parameters at site have also been less than detection limits or less than guidelines historically. In 2023, monitoring well 15MW15-Deep had a PHC F2 detection of 0.28 mg/L, but it was less than the applicable guideline of 1.1 mg/L. Tetra Tech's detailed technical investigation (Tetra Tech 2016) indicated that naturally occurring hydrocarbons were present on the site. The regional geographic information describes the bedrock formations as carboniferous shale and sandstone. Bedrock in the area is documented to be late Cretaceous in age and composed of Horseshoe Canyon, Bearspaw, Belly River Group, and Lea Park Formations (HCL 1999). Three of these formations are present below the site with the exception of the Horseshoe Canyon Formation. The lower bedrock unit consists of the Belly River Group where natural occurring hydrocarbons have been documented (Moell 2005). The concentration detected at 15MW15-Deep will be re-assessed as part of the routine GMP sampling program in 2024.

Several wells had total phenols detections greater than the analytical detection limit in 2023, Previously, total phenols were detected at most wells in 2021 and concentrations should continue to be monitored for potential trends.

5.1 Source Elimination and Remedial Activities

Based on the requirements of Section 4.9.18(s) of the Approval, the following is a description of any groundwater remediation, source elimination, risk assessment studies, or risk management studies undertaken in 2023.

As stated in the introduction, the facility is an engineered Class I landfill, storage, and disposal facility licensed to accept various hazardous waste liquids and solids for disposal and/or transfer. As a Class I landfill, the engineered cells of the landfill were designed with source elimination as a top priority. In the case of the landfill, the "source" discussed is the hazardous waste being landfilled and its associated leachate. The source elimination measures implemented are the construction of landfill cells with engineered liners installed at the base that are impervious to water and are graded at the base to allow the collection and disposal of leachate. As a performance assessment measure, the cells are also constructed with a leak detection layer to confirm function of the primary engineered liner. Both the pumping of leachate to maintain minimum levels and regular pumping out of any liquids in the leak detection layer are means of risk management for potential impacts.

Although not a risk assessment or management study, additional sampling was performed in 2023 outside of the requirements of the GMP. This included additional sampling at MW27B to evaluate recent increasing trends in chloride at this well.

No remediation, source elimination or other studies were undertaken in 2023.

Figure 7 provides a site plan and shows potential sources of impact at the site which include: the landfill cells; surface storage and handling of leachate at each cell adjacent to the leachate risers; the potential for tracking of either waste or leachate from regular operations; and other operational activities such as use of road salt. Clean Harbors has various operational measures including spill prevention to limit the potential for impacts as described in the Operations Plan and annual operations reporting. Figure 7 further highlights wells with groundwater parameter concentrations greater than guidelines. The potential presence of contamination has not been established at the site; however, chloride concentrations in the vicinity of MW27B require further evaluation as included in the recommendations below.

5.2 Recommendations for 2024 Monitoring Program

The 2024 Monitoring Program should be continued based on the recommendations presented in the proposed GMP (Tetra Tech 2022) including monitoring wells and sampling schedule. If that GMP has not yet been approved by Alberta EPA by the time of the annual monitoring event, the current GMP as implemented in 2023 and as described in this report should be undertaken.

The well network should include the newly installed 23MW38A and 23MW38B, as well as new wells installed north and northeast of Cell 5, which will be operational in 2024. These wells are not described in the current GMP but have been included in the proposed GMP (Tetra Tech 2022).

Based on the outcome of the recommended additional assessment work in the vicinity of MW27B, additional groundwater sampling may be recommended proximate to that location.

6.0 CONCLUSIONS AND RECOMMENDATIONS

The 2023 GMP findings are summarized as follows:

- The interpreted groundwater flow directions in surficial materials, upper sandstone, and clay shale are generally consistent with previous years.
- The natural groundwater type is sodium sulphate and natural mineralization accounts for high concentrations of sodium, sulphate, and TDS concentrations in the groundwater across the facility.
- Chloride concentrations at MW27B, installed in the upper sandstone have been measured greater than the guideline since 2021. Monitoring well MW27B is located south of Cell 3D and recorded chloride concentrations that rapidly increased from 2018 (49 mg/L) to 2022 (174 mg/L) before marginally decreasing in 2023 (173 mg/L and 164 mg/L in June and October, respectively). Increasing chloride concentrations may be related to surface water infiltration, local operational activity or monitoring well integrity issues. There are no other parameter trends noted at this well, and the chloride appears to be sodium chloride; it is interpreted to be more likely related to surface impact such as from road salt, rather than impact by leachate based on the absence of other indicators. The deeper monitoring well in this nest (MW27A) does not show indication of chloride, measuring 4.63 mg/L in 2023. Further assessment of the identified trends at MW27B is recommended below.
- In 2023, dissolved metals and routine parameters were generally within the historical concentration ranges and there continues to be no detection of VOC parameters analysed. In 2023, there was one PHC F2 detection below the Tier 1 Guideline at monitoring well 15MW15-Deep which is not consistent with historical results, and all other concentrations of hydrocarbon parameters analysed in groundwater samples were below the detection limit. Naturally occurring hydrocarbons have been identified in deeper bedrock units at and in the vicinity of the site.
- Total phenol concentrations greater than laboratory detection limits have been present since 2018. In 2023, several wells had groundwater with concentrations of phenols above the laboratory detection limit.

Overall, there were no indications of adverse groundwater impacts resulting from facility activities with the exception of an increasing chloride trend noted at MW27B (upper sandstone unit). Based on the results from the work conducted in 2023, the following is recommended for Clean Harbors' consideration:

- The groundwater monitoring and sampling fieldwork should continue to be conducted in late May or early June to minimize the number of frozen wells and maximize groundwater availability for sampling.
- The geodetic elevations of monitoring wells 23MW38A and 23MW38B should be surveyed in 2023 to support groundwater contouring.

- The revised GMP has been submitted to Alberta EPA and is under review. The current GMP should be maintained until the revised GMP has been accepted by Alberta EPA. The exception to this is the monitoring and sampling of wells in the north quarter as part of the proposed baseline groundwater monitoring program which was accepted for implementation by Alberta EPA on July 13, 2023.
- Conduct further investigation in the vicinity of MW27B. This is proposed to include: a comprehensive evaluation of leachate chemistry and leak detection port sampling undertaken at adjacent cells; an assessment of well integrity with a camera inspection; further evaluation of surface activities and housekeeping adjacent to the well; and based on the outcome of those assessments, consideration of further investigation utilizing either geophysical means (electromagnetic survey) and/or drilling of additional boreholes targeting the surficial soils and upper sandstone units proximate to this location, if necessary.

7.0 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.

FILE: 704-SWM.SWOP04591-03
FILE: 704-SWM.SWOP04591-03
FILE: 704-SWM.SWOP04591-03

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PERMIT TO PRACTICE
TETRA TECH CANADA INC.

RM SIGNATURE: _____

RM APEGA ID #: 2024-03-26 Member 62764

DATE: _____

PERMIT NUMBER: P013774
The Association of Professional Engineers and Geoscientists of Alberta (APEGA)

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Table 1: 2023 Groundwater Analytical Schedule

Sample	Laboratory Analytical Parameters
48 Groundwater Monitoring Wells 4 Field Duplicates 1 Trip Blank, 1 Field Blank	pH (field and laboratory)
	Electrical Conductivity (field and laboratory)
	Routine (major ions) - Total Dissolved Solids (TDS), Alkalinity, Hardness (as CaCO3), Chloride, Calcium, Magnesium, Sodium, Potassium, Sulphate, Nitrate-N, and Nitrite-N
	Dissolved Metals (including Dissolved Mercury)
	Total Kjeldahl Nitrogen (TKN)
	Ammonia-N
	Chemical Oxygen Demand (COD)
	Dissolved Organic Carbon (DOC)
	Benzene, Toluene, Ethylbenzene, Xylenes (BTEX)
	Petroleum Hydrocarbon (PHC) Fractions F1 and F2
	Total Phenols
	Volatile Organic Compounds (VOCs) - Methylene Chloride, Vinyl Chloride, Trichloroethylene (TCE), and Tetrachloroethylene (PCE)

Table 2: Monitoring Well Details

Groundwater Monitoring Zone	Well Identification	Date Installed	Elevations		Measured Stick-up (m)	Measured Well Depth			Screened Interval				Sand Pack Interval (mbgl)		Lithology Screened
			Surface (m AMSL)	Top of Pipe (m AMSL)		(m BTOP)	(mbgl)	(m AMSL)	Top Screen Depth (mbgl)	Bottom Screen Depth (mbgl)	Top Screen Elevation (m AMSL)	Bottom Screen Elevation (m AMSL)	Top Depth (mbgl)	Bottom Depth (mbgl)	
Surficial Materials 14 Wells	MW10	19-Feb-1991	687.44	687.96	0.43	3.86	3.43	684.10	1.93	3.43	685.51	684.01	1.63	3.43	clay till / clay shale / sandstone
	MW18B	30-Sep-1996	687.12	687.85	0.74	5.98	5.24	681.88	2.24	5.24	684.88	681.88	2.10	5.24	clay till / clay shale / sandstone
	MW19B	1-Oct-1996	686.65	687.14	0.31	4.23	3.92	682.91	0.92	3.92	685.73	682.73	0.72	3.92	clay shale / sandstone
	MW20B	1-Oct-1996	688.92	689.65	0.70	5.10	4.40	684.55	1.40	4.40	687.52	684.52	1.20	4.40	clay till / clay shale / sandstone
	MW21B	1-Oct-1998	687.54	688.55	0.89	6.09	5.20	682.46	2.20	5.20	685.35	682.35	1.90	5.20	clay till / sandstone / siltstone
	MW22B	1-Oct-1998	687.81	688.70	0.89	6.84	5.95	681.86	2.95	5.95	684.86	681.86	2.95	5.95	clay till / sandstone / clay shale
	MW29B	8-Oct-2014	688.13	688.93	0.77	5.45	4.68	683.48	3.18	4.68	684.96	683.46	2.88	4.68	sand
	MW30B	8-Oct-2014	688.52	689.31	0.82	5.44	4.62	683.87	3.12	4.62	685.41	683.91	2.82	4.62	clay till
	MW31B	8-Oct-2014	686.40	687.17	0.54	3.91	3.37	683.27	1.87	3.37	684.53	683.03	1.57	3.37	clay till / sandstone
	MW32B	8-Oct-2014	686.54	687.23	0.62	4.89	4.27	682.34	2.77	4.27	683.77	682.27	2.47	4.50	clay till / sand
	MW33B	6-Oct-2014	686.94	687.87	0.97	5.51	4.54	682.35	3.04	4.54	683.89	682.39	2.74	4.54	sand / sandstone
	19MW37B (Decommissioned)	30-Oct-2019	-	-	0.88	5.48	4.20	-	2.70	4.20	-	-	2.40	4.50	clay / sand / sandstone
	19MW38B (Decommissioned)	30-Oct-2019	-	-	0.95	5.19	4.00	-	3.50	4.00	-	-	3.20	4.00	clay / sand / sandstone
	23MW38B	19-Dec-2023	-	-	0.86	5.46	4.60	-	3.07	4.60	-	-	2.77	4.60	clay / sand / sandstone
	15MW35C	28-Jul-2015	688.53	689.50	0.95	4.17	3.22	685.32	2.00	3.22	686.53	685.31	1.70	3.22	clay till
Upper Sandstone 14 Wells	MW1C	14-Jun-2011	687.64	688.61	0.92	6.43	5.51	682.18	4.01	5.51	683.63	682.13	3.70	5.51	clay shale/ sandstone
	MW8B	4-Oct-2012	686.82	687.69	0.88	5.40	4.52	682.29	3.02	4.52	683.80	682.30	1.8	4.52	clay / sand
	MW11	19-Feb-1991	687.95	688.37	0.36	6.21	5.85	682.16	4.35	5.85	683.60	682.10	4.05	5.85	clay shale / sandstone
	MW12A (Decommissioned)	19-Feb-1991	686.62	687.13	0.10	6.15	6.05	680.98	4.55	6.05	682.07	680.57	4.25	6.05	clay till / clay shale / sandstone
	MW23B	1-Oct-1998	686.48	687.38	0.90	4.47	3.57	682.90	0.57	3.57	685.90	682.90	0.37	3.57	sand / sandstone
	MW25B	13-Aug-2004	686.91	687.48	0.41	6.12	5.71	681.36	2.71	5.71	684.20	681.20	2.51	5.71	sandstone / clay shale
	MW26B	13-Aug-2004	687.14	687.63	0.45	5.94	5.49	681.69	2.49	5.49	684.65	681.65	2.19	5.49	clay shale / sandstone / siltstone
	MW27B	1-Oct-2007	686.50	687.15	0.65	6.61	5.96	680.54	2.96	5.96	683.54	680.54	2.66	5.96	sand / siltstone
	MW28B	4-Oct-2012	687.44	687.97	0.51	7.10	6.59	680.87	3.59	6.59	683.85	680.85	3.29	6.59	sand / siltstone
	MW29A	6-Oct-2014	688.06	688.89	0.84	10.22	9.38	678.67	7.88	9.38	680.18	678.68	7.38	9.38	sandstone
	MW30A	8-Oct-2014	688.57	689.37	0.76	8.89	8.13	680.48	6.13	8.13	682.44	680.44	5.83	9.00	sandstone
	MW31A	8-Oct-2014	686.38	687.12	0.61	9.74	9.13	677.39	7.13	9.13	679.25	677.25	6.83	9.13	sandstone
	MW33A	6-Oct-2014	686.92	687.93	0.89	15.67	14.78	672.26	12.78	14.78	674.14	672.14	12.48	14.78	sandstone
	15MW35B	28-Jul-2015	688.47	689.40	0.83	7.98	7.16	681.41	5.50	7.16	682.97	681.31	5.20	7.16	sandstone
Clay Shale 18 Wells	MW1B	30-Sep-1996	687.82	688.70	0.77	10.71	9.94	677.99	8.44	9.94	679.38	677.88	8.00	9.94	clay shale
	MW8A	4-Oct-2012	686.84	687.83	0.92	10.16	9.24	677.67	6.24	9.24	680.60	677.60	6.6	9.24	clay / sand / siltstone
	MW12B (Decommissioned)	30-Sep-1996	687.27	687.78	0.27	10.41	10.14	677.36	8.64	10.14	678.63	677.13	8.34	10.14	clay shale
	MW18A	1-Oct-1996	687.13	687.77	0.62	10.70	10.08	677.06	8.58	10.08	678.55	677.05	8.15	10.08	clay shale
	MW19A	1-Oct-1996	686.60	687.10	0.17	10.70	10.53	676.39	9.03	10.53	677.56	676.06	8.20	10.53	clay shale
	MW20A	1-Oct-1996	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
	MW21A	1-Oct-1998	687.60	688.30	0.61	10.66	10.05	677.64	8.55	10.05	679.05	677.55	8.25	10.05	clay shale / siltstone
	MW22A	1-Oct-1998	687.83	688.66	0.82	10.65	9.83	678.02	8.33	9.83	679.51	678.01	8.03	9.83	clay shale / sandstone / siltstone
	MW23A	1-Oct-1998	686.45	687.16	0.64	10.65	10.01	676.51	8.51	10.01	677.94	676.44	8.01	10.01	clay shale / sandstone / siltstone
	MW25A	13-Aug-2004	686.73	687.54	0.21	10.72	10.51	676.82	9.01	10.51	677.72	676.22	8.51	10.51	clay shale
	MW26A	13-Aug-2004	687.00	687.60	0.56	10.72	10.16	676.88	8.66	10.16	678.34	676.84	8.16	10.16	clay shale
	MW27A	1-Oct-2007	686.65	687.19	0.47	10.93	10.46	676.26	8.96	10.46	677.69	676.19	9.26	10.46	siltstone
	MW28A	4-Oct-2012	687.36	687.96	0.59	11.76	11.17	676.20	9.67	11.17	677.69	676.19	9.37	11.17	siltstone
	MW32A	8-Oct-2014	686.53	687.19	0.61	10.09	9.48	677.10	7.48	9.48	679.05	677.05	7.18	9.48	clay
	19MW37A (Decommissioned)	30-Oct-2019	-	-	0.89	13.36	12.00	-	9.00	12.00	-	-	4.00	13.50	clay shale
	19MW38A (Decommissioned)	30-Oct-2019	-	-	0.80	14.75	13.40	-	8.90	13.40	-	-	8.60	13.50	clay shale
	23MW38A	19-Dec-2023	-	-	0.96	14.15	13.19	-	10.14	13.19	-	-	9.84	13.34	clay shale
	15MW35A	28-Jul-2015	688.46	689.32	0.84	14.55	13.71	674.77	11.70	13.71	676.76	674.75	11.50	13.71	clay shale
	15MW36A	28-Jul-2015	687.05	687.95	0.61	15.81	15.20	672.13	12.70	15.20	674.35	671.85	12.40	15.20	clay shale
Lower Bedrock 2 Wells	15MW35-Deep	28-Jul-2015	688.43	689.32	0.91	33.41	32.50	655.91	31.00	32.50	657.43	655.93	29.70	32.50	sandstone
	15MW36-Deep	21-Jul-2015	687.03	687.79	0.43	36.36	35.93	651.42	33.60	35.93	653.43	651.10	33.30	35.93	sandstone

Notes:
*19MW38A/B decommissioned in 2022 and replaced by 23MW38A/B in 2023.
Monitoring well network re-surveyed on July 30, 2015.
m AMSL - metres above mean sea level.
mbgl - metres below ground level.
m BTOP - metres below top of pipe.

Table 3a: Groundwater Monitoring Results - Surficial Materials

Monitoring Well	UTM Coordinates		Elevations		Measured Stick-up (m)	Well Depth (mbgl)	Screened Interval		Date	Water Depth		Groundwater Elevation (mAMSL)
	Easting	Northing	Surface (mAMSL)	Top of Pipe (mAMSL)			Top Screen Depth (mbgl)	Bottom Screen Depth (mbgl)		mBTOP	mbgl	
MW9 Decommissioned July 2018	-	-	686.97	687.47	0.42	4.93	3.43	4.93	May-14	2.33	1.91	685.14
									May-15	2.12	1.70	685.35
									May-16	1.92	1.50	685.55
									May-17	1.45	1.03	686.02
									Jun-18	2.28	1.86	685.19
MW10	405422	5906714	687.44	687.96	0.38	3.49	1.99	3.49	May-14	2.20	1.82	685.76
									May-15	1.82	1.44	686.13
									May-16	2.06	1.68	685.89
									May-17	1.31	0.93	686.64
									Jun-18	1.95	1.57	686.01
									Jun-19	1.71	1.33	686.25
									May-20	1.64	1.26	686.31
					0.43				Jun-21	1.46	1.03	686.50
									Jun-22	1.38	0.95	686.58
					0.46				Jun-23	1.42	0.96	686.53
MW18B	404791.4	5906705.4	687.12	687.85	0.74	5.27	2.27	5.27	May-14	1.83	1.09	686.03
									May-15	1.88	1.14	685.98
									May-16	2.05	1.32	685.80
									May-17	1.24	0.51	686.61
									Jun-18	1.53	0.79	686.33
									Jun-19	1.62	0.88	686.24
									May-20	1.15	0.41	686.71
									02-Jun-21	1.26	0.53	686.59
									Jun-22	1.86	1.125	685.99
									Jun-23	2.372	1.637	685.48
MW19B	404792	5906618	686.65	687.14	0.50	4.84	1.84	4.84	May-14	1.08	0.59	686.05
									May-15	1.11	0.61	686.03
									May-16	1.38	0.89	685.75
									May-17	0.89	0.39	686.25
					0.35				Jun-18	1.21	0.87	685.93
									Jun-19	1.24	0.89	685.90
									May-20	0.82	0.47	686.32
					0.31				Jun-21	0.86	0.51	686.28
					0.35				Jun-22	1.14	0.79	686.00
					0.24				Jun-23	1.498	1.26	685.64
MW20B	404789	5906514	688.92	689.65	0.71	4.40	1.40	4.40	May-14	3.66	2.95	685.99
									May-15	3.77	3.06	685.88
									May-16	3.91	3.20	685.74
									May-17	3.38	2.67	686.28
					0.64				Jun-18	3.75	3.11	685.91
									Jun-19	3.77	3.13	685.89
									May-20	3.31	2.67	686.34
					0.70				Jun-21	3.17	2.47	686.48
									Jun-22	3.49	2.79	686.17
					0.57				Jun-23	3.53	3.53	686.13
MW21B	404786.1	5906389.7	687.54	688.55	0.97	5.11	2.11	5.11	May-14	3.01	2.04	685.54
									May-15	3.09	2.12	685.46
									May-16	3.28	2.31	685.27
									May-17	2.99	2.02	685.56
									Jun-18	2.94	1.97	685.60
									Jun-19	2.96	1.99	685.59
									May-20	2.47	1.50	686.08
					0.89				Jun-21	2.38	2.38	686.17
					0.96				Jun-22	2.69	2.69	685.86
									Jun-23	2.57	2.57	685.98
MW22B	404852.8	5906350.6	687.81	688.70	0.87	5.22	2.22	5.22	May-14	3.14	2.27	685.56
									May-15	3.28	2.41	685.43
									May-16	3.50	2.63	685.20
									May-17	3.23	2.36	685.47
									Jun-18	3.09	2.22	685.62
									Jun-19	3.10	2.23	685.61
									May-20	2.99	2.12	685.72
					0.89				May-21	2.46	1.59	686.24
					0.87				Jun-22	2.77	1.90	685.93
									Jun-23	2.801	1.93	685.90
MW24B Decommissioned July 2018	-	-	688.86	689.63	0.70	5.38	2.38	5.38	May-14	3.81	3.11	685.82
									May-15	2.74	2.05	686.89
									May-16	2.55	1.86	687.08
									May-17	2.49	1.80	687.14
					0.63				Jun-18	2.68	2.05	686.96

Table 3a: Groundwater Monitoring Results - Surficial Materials

Monitoring Well	UTM Coordinates		Elevations		Measured Stick-up (m)	Well Depth (mbgl)	Screened Interval		Date	Water Depth		Groundwater Elevation (mAMSL)
	Easting	Northing	Surface (mAMSL)	Top of Pipe (mAMSL)			Top Screen Depth (mbgl)	Bottom Screen Depth (mbgl)		mBTOP	mbgl	
MW29B	405411.1	5906365.2	688.13	688.93	0.78	4.67	3.17	4.67	May-15	3.97	3.19	684.95
									May-16	2.83	2.05	686.10
									May-17	2.92	2.14	686.01
									Jun-18	2.23	1.45	686.70
									Jun-19	2.91	2.13	686.02
									May-20	2.71	1.93	686.22
					0.77				May-21	3.13	2.36	685.79
					0.79				Jun-22	2.65	1.86	686.28
					0.88				Jun-23	2.341	1.46	686.59
MW30B	405485.0	5906376.1	688.52	689.31	0.75	4.70	3.20	4.70	May-15	4.41	3.66	684.90
									May-16	3.51	2.76	685.80
									May-17	3.44	2.69	685.87
									Jun-18	3.68	2.93	685.63
									Jun-19	3.41	2.66	685.90
									May-20	3.27	2.52	686.04
					0.82				May-21	3.44	2.62	685.87
					0.77				Jun-22	3.20	2.43	686.11
					0.76				Jun-23	3.94	3.18	685.37
MW31B	405536.5	5906465.0	686.40	687.17	0.73	3.19	1.69	3.19	May-15	2.46	1.73	684.71
									May-16	2.23	1.50	684.95
									May-17	2.10	1.37	685.07
					0.53				Jun-18	2.12	1.59	685.05
									Jun-19	1.74	1.21	685.43
									May-20	1.41	0.88	685.76
					0.54				May-21	1.89	1.35	685.29
					0.56				Jun-22	1.46	0.90	685.71
					0.57				Jun-23	2.262	1.69	684.91
MW32B	405529.2	5906577.5	686.54	687.23	0.68	4.20	2.70	4.20	May-15	2.54	1.86	684.68
									May-16	2.33	1.65	684.90
									May-17	2.31	1.63	684.91
									Jun-18	2.37	1.69	684.86
									Jun-19	1.93	1.25	685.30
									May-20	1.59	0.91	685.64
					0.62				May-21	2.08	1.46	685.15
					0.67				Jun-22	1.57	0.90	685.66
					0.63				Jun-23	2.225	1.60	685.00
MW33B	405513.05	5906661.242	686.94	687.87	0.90	4.61	3.11	4.61	Aug-15	1.65	0.75	686.21
									May-16	1.60	0.70	686.27
									May-17	1.40	0.50	686.47
									Jun-18	1.73	0.83	686.14
									Jun-19	1.69	0.79	686.18
									May-20	1.54	0.64	686.33
					0.97				May-21	1.57	0.60	686.29
					0.99				Jun-22	1.57	0.58	686.30
					1.00				Jun-23	1.686	0.69	686.18
15MW34B Decommissioned July 2018	405099.2	5906742.3	687.97	688.96	0.99	4.80	3.20	4.80	Aug-15	5.79	4.80	683.17
									May-16	3.07	2.08	685.89
									May-17	2.73	1.74	686.23
									Jun-18	3.56	2.57	685.40
15MW35C	404801.2	5906265.6	688.53	689.50	0.94	3.25	2.00	3.25	Aug-15	3.82	2.88	685.68
									May-16	Dry	-	
									May-17	Dry	-	
									Jun-18	4.04	3.10	685.46
									Jun-19	3.95	3.01	685.55
									May-20	Dry	-	
									Jun-22	3.56	3.56	685.94
					0.96				Jun-23	Dry	-	
19MW37B Decommissioned June 27, 2023	1261.99	1003.8	685.98	686.99	0.84	4.69	1.69	4.69	Jun-19	1.44	0.60	685.55
									May-20	1.42	0.58	685.57
					0.88				Jun-21	1.32	0.35	685.67
					0.97				Jun-22	1.15	0.18	685.84
					0.97				May-23	2.397	1.43	684.59
19MW38B Decommissioned October 24, 2022	1459.7	995.98	687.02	687.96	0.94	4.66	1.66	4.66	Jun-19	1.26	0.32	686.71
									May-20	1.97	1.03	685.99
					0.95				Jun-21	1.59	0.67	686.38
					0.92				Jun-22	1.88	0.96	686.08
23MW38B	-	-	-	-	0.86	4.60	3.07	4.6	Dec-23	2.26	1.32	-

Notes:
Monitoring well network re-surveyed on July 30, 2015.
mAMSL - metres above mean sea level.
mbgl - metres below ground level.
mBTOP - metres below top of pipe.
-' - no information available.

Table 3b: Groundwater Monitoring Results - Upper Sandstone

Monitoring Well	UTM Coordinates		Elevations		Measured Stick-up (m)	Well Depth (mbgl	Screened Interval		Date	Water Depth		Groundwater Elevation (mAMSL)
	Easting	Northing	Surface (mAMSL)	Top of Pipe (mAMSL)			Top Screen Depth (mbgl)	Bottom Screen Depth (mbgl)		mBTOP	mbgl	
MW1C	404794.2	5906756.1	687.64	688.61	0.94	5.51	4.01	5.51	May-14	2.88	1.94	685.73
									May-15	2.99	2.05	685.62
									May-16	3.46	2.52	685.15
									May-17	2.49	1.55	686.12
									Jun-18	3.15	2.21	685.46
									Jun-19	3.136	2.20	685.47
									May-20	2.39	1.45	686.22
					0.92				Jun-21	2.484	1.56	686.13
					0.94				Jun-22	2.87	1.93	685.74
					0.94				Jun-23	3.645	2.71	684.96
MW5A Decommissioned July 2018	405028.0	5906686.8	688.28	689.17	0.90	6.74	5.24	6.74	May-14	4.06	3.16	685.11
									May-15	2.21	1.31	686.96
									May-16	3.38	2.48	685.79
									May-17	3.03	2.13	686.14
									Jun-18	3.61	2.71	685.57
MW8B	405329.3	5906650.0	686.82	687.69	0.85	4.57	3.07	4.57	May-14	2.30	1.45	685.39
									May-15	1.84	0.99	685.86
									May-16	1.56	0.71	686.13
									May-17	1.43	0.58	686.27
									Jun-18	1.76	0.91	685.93
									Jun-19	1.24	0.39	686.45
									May-20	1.30	0.45	686.39
					0.88				Jun-21	1.22	0.34	686.47
					0.90				Jun-22	1.36	0.46	686.33
									Jun-23	1.21	0.31	686.48
MW11	405514.5	5906740.3	687.95	688.37	0.42	5.83	4.33	5.83	May-14	2.48	2.07	685.89
									May-15	2.31	1.89	686.06
									May-16	2.47	2.05	685.90
									May-17	1.73	1.31	686.64
					0.32				Jun-18	2.57	2.25	685.80
									Jun-19	2.26	1.94	686.11
									May-20	1.88	1.56	686.49
					0.36				Jun-21	1.77	1.38	686.60
					0.39				Jun-22	1.81	1.42	686.56
									Jun-23	1.91	1.52	686.46
MW12A Decommissioned April 27, 2023			686.62	687.13	0.39	5.78	4.28	5.78	May-14	1.69	1.30	685.44
									May-15	1.47	1.08	685.67
									May-16	1.74	1.35	685.40
									May-17	1.20	0.81	685.93
					0.34				Jun-18	2.99	2.65	684.14
									Jun-19	2.15	1.81	684.98
									May-20	1.71	1.36	685.43
					0.10				Jun-21	1.57	1.42	685.56
					0.15				Jun-22	1.76	1.61	685.37
MW14 Decommissioned July 2018			686.52	687.56	0.94	6.14	4.64	6.14	May-14	2.18	1.25	685.38
									May-15	2.70	1.77	684.86
									May-16	1.63	0.70	685.92
									May-17	1.75	0.82	685.81
									Jun-18	2.67	1.73	684.89
MW23B	404898.2	5906361.0	686.48	687.38	0.86	4.50	1.50	4.50	May-14	1.58	0.72	685.80
									May-15	1.66	0.81	685.71
									May-16	1.94	1.09	685.44
									May-17	1.70	0.85	685.67
									Jun-18	1.58	0.72	685.80
									Jun-19	1.64	0.79	685.73
									May-20	1.54	0.69	685.83
					0.90				May-21	1.11	0.17	686.27
					0.94				Jun-22	1.41	0.47	685.97
									Jun-23	1.47	0.53	685.91
MW25B	404968.9	5906383.6	686.91	687.48	0.59	5.51	2.51	5.51	May-14	1.36	0.77	686.13
									May-15	1.65	1.06	685.83
									May-16	1.90	1.31	685.58
									May-17	1.68	1.09	685.80
					0.36				Jun-18	1.63	1.27	685.85
									Jun-19	1.67	1.31	685.82
									May-20	1.52	1.16	685.97
					0.41				May-21	1.17	0.75	686.32
					0.42				Jun-22	1.43	1.01	686.05
									Jun-23	1.51	1.09	685.98
MW26B	405056.1	5906389.5	687.14	687.63	0.49	5.56	2.56	5.56	May-14	0.67	0.18	686.96
									May-15	1.68	1.20	685.94
									May-16	1.99	1.51	685.64
									May-17	1.64	1.16	685.98
					0.42				Jun-18	1.83	1.41	685.80
									Jun-19	1.81	1.39	685.81
									May-20	2.57	2.15	685.06
					0.45				May-21	1.29	0.84	686.34
					0.56				Jun-22	1.52	0.96	686.11
					0.49				Jun-23	1.65	1.16	685.98
MW27B	405212.0	5906397.2	686.50	687.15	0.63	5.98	2.98	5.98	May-14	0.68	0.05	686.47
									May-15	1.00	0.37	686.15
									May-16	1.17	0.54	685.98
									May-17	0.96	0.33	686.19
									Jun-18	1.29	0.66	685.86
									Jun-19	1.10	0.47	686.05
									May-20	0.88	0.25	686.27
					0.65				May-21	0.99	0.34	686.16
					0.64				Jun-22	0.91	0.27	686.24
					0.65				Jun-23	1.23	0.58	685.92
MW28B	405317.2	5906379.9	687.44	687.97	0.52	6.57	3.57	6.57	May-14	2.59	2.07	685.38
									May-15	2.39	1.87	685.58
									May-16	2.13	1.61	685.84
									May-17	1.85	1.33	686.13
									Jun-18	2.07	1.55	685.91
									Jun-19	1.91	1.40	686.06
									May-20	1.64	1.12	686.33
					0.51				May-21	2.04	1.53	685.94
					0.52				Jun-22	1.75	1.23	686.22
					0.53				Jun-23	2.34	1.81	685.63

Table 3b: Groundwater Monitoring Results - Upper Sandstone

Monitoring Well	UTM Coordinates		Elevations		Measured Stick-up (m)	Well Depth (mbgl	Screened Interval		Date	Water Depth		Groundwater Elevation (mAMSL)
	Easting	Northing	Surface (mAMSL)	Top of Pipe (mAMSL)			Top Screen Depth (mbgl)	Bottom Screen Depth (mbgl)		mBTOP	mbgl	
MW29A	405409.4	5906365.0	688.06	688.89	0.82	9.42	7.92	9.42	May-15	3.96	3.14	684.93
									May-16	2.91	2.09	685.98
									May-17	2.88	2.06	686.01
					0.87				Jun-18	2.19	1.32	686.70
									Jun-19	2.83	1.96	686.06
									May-20	2.65	1.78	686.23
					0.84				May-21	3.15	2.31	685.74
					0.79				Jun-22	2.59	1.80	686.30
					0.85				Jun-23	3.58	2.73	685.31
MW30A	405483.7	5906375.1	688.57	689.37	0.76	8.15	6.15	8.15	May-15	4.51	3.75	684.87
									May-16	3.42	2.66	685.95
									May-17	3.48	2.72	685.90
									Jun-18	2.73	1.97	686.65
									Jun-19	3.41	2.65	685.96
									May-20	3.24	2.48	686.13
					0.76				May-21	3.69	2.93	685.68
					0.78				Jun-22	3.20	2.42	686.17
					0.80				Jun-23	4.06	3.26	685.31
MW31A	405537.6	5906464.6	686.38	687.12	0.69	9.07	7.07	9.07	May-15	2.05	1.37	685.07
									May-16	2.80	2.11	684.32
									May-17	2.41	1.73	684.71
					0.48				Jun-18	2.40	1.92	684.72
									Jun-19	2.40	1.92	684.73
									May-20	2.26	1.78	684.86
					0.61				May-21	2.23	1.62	684.89
					0.54				Jun-22	1.99	1.45	685.13
					0.57				Jun-23	2.38	1.81	684.74
MW33A	405513.1	5906661.2	686.92	687.93	0.92	13.20	11.20	13.20	May-15	2.41	1.49	685.52
									May-16	2.30	1.39	685.63
									May-17	2.11	1.20	685.82
									Jun-18	2.17	1.25	685.77
									Jun-19	2.11	1.20	685.82
									May-20	2.56	1.65	685.37
					0.89				May-21	2.45	1.56	685.49
					0.94				Jun-22	2.05	1.11	685.88
					0.97				Jun-23	1.98	1.01	685.95
15MW35B	404801.2	5906265.6	688.47	689.40	0.81	7.17	5.50	7.17	Aug-15	6.34	5.53	683.06
									May-16	4.78	3.97	684.62
									May-17	4.45	3.64	684.95
									Jun-18	4.02	3.21	685.38
									Jun-19	3.92	3.11	685.47
									May-20	4.01	3.20	685.39
					0.83				Jun-21	3.27	2.44	686.13
					0.81				Jun-22	3.48	2.67	685.92
					0.86				Jun-23	3.62	2.76	685.77

Notes:
Monitoring well network re-surveyed on July 30, 2015.
mAMSL - metres above mean sea level.
mbgl - metres below ground level.
mBTOP - metres below top of pipe.
-' - no information available.

Table 3c: Groundwater Monitoring Results - Clay Shale

Monitoring Well	UTM Coordinates		Elevations		Measured Stick-up (m)	Well Depth (mbgl	Screened Interval		Date	Water Depth		Groundwater Elevation (mAMSL)
	Easting	Northing	Surface (mAMSL)	Top of Pipe (mAMSL)			Top Screen Depth (mbgl)	Bottom Screen Depth (mbgl)		mBTOP	mbgl	
MW1B	404796.9	5906757.0	687.82	688.70	0.87	9.86	8.36	9.86	May-14	3.80	2.94	684.90
									May-15	3.65	2.78	685.06
									May-16	3.87	3.00	684.83
									May-17	3.53	2.66	685.17
									Jun-18	3.63	2.76	685.07
									Jun-19	4.00	3.13	684.70
									May-20	3.30	2.43	685.40
					0.77				Jun-21	3.22	2.45	685.48
					0.83				Jun-22	3.74	2.91	684.96
					0.80				Jun-23	4.13	3.33	684.57
MW5B Decommissioned July 2018	-	-	688.25	689.10	0.83	9.69	8.19	9.69	May-15	4.83	4.00	684.27
									May-16	5.62	4.79	683.48
									May-17	4.76	3.93	684.34
					0.88				Jun-18	4.79	3.91	684.31
MW8A	405329.3	5906650.0	686.84	687.83	0.98	10.28	7.28	10.28	May-14	2.05	1.07	685.78
									May-15	1.87	0.89	685.96
									May-16	1.76	0.78	686.06
									May-17	1.54	0.56	686.29
									Jun-18	1.92	0.94	685.90
									Jun-19	1.39	0.41	686.44
									May-20	2.94	1.96	684.88
					0.92				Jun-21	2.68	1.76	685.14
					1.05				Jun-22	0.51	-0.54	687.32
					1.00				Jun-23	1.43	0.43	686.40
MW12B Decommissioned June 27, 2023	404902.3	5906756.3	687.27	687.78	0.20	10.49	8.99	10.49	May-14	2.38	2.18	685.40
									May-15	2.21	2.01	685.57
									May-16	2.53	2.33	685.24
									May-17	1.99	1.79	685.79
					0.27				Jun-18	1.88	1.61	685.90
									Jun-19	2.79	2.52	684.99
									May-20	2.41	2.14	685.37
									Jun-21	2.11	1.84	685.66
					0.24				Jun-22	2.30	2.03	685.48
									May-23	3.37	3.10	684.41
MW18A	404791.4	5906705.4	687.13	687.77	0.64	10.08	8.58	10.08	May-14	2.13	1.49	685.63
									May-15	2.04	1.40	685.73
									May-16	2.20	1.56	685.57
									May-17	1.92	1.28	685.84
									Jun-18	2.08	1.44	685.69
									Jun-19	2.23	1.59	685.53
									May-20	1.73	1.09	686.03
					0.62				Jun-21	1.71	1.09	686.06
					0.56				Jun-22	2.12	1.56	685.65
					0.62				Jun-23	1.95	1.33	685.82
MW19A	404792.3	5906618.5	686.60	687.10	0.46	10.26	8.76	10.26	May-14	1.09	0.64	686.00
									May-15	1.05	0.60	686.04
									May-16	1.34	0.88	685.76
									May-17	0.81	0.35	686.29
					0.26				Jun-18	0.99	0.73	686.11
									Jun-19	1.131	0.87	685.96
									May-20	0.729	0.47	686.37
					0.17				Jun-21	0.756	0.59	686.34
					0.20				Jun-22	1.03	0.83	686.07
					0.18				Jun-23	1.356	1.18	685.74
MW20A	404788.5	5906514.3	688.89	689.54	0.60	10.00	8.50	10.00	May-14	3.79	3.19	685.75
									May-15	2.66	2.06	686.87
									May-16	3.99	3.39	685.55
									May-17	3.72	3.12	685.82
									Jun-18	3.94	3.34	685.60
									Jun-19	3.715	3.12	685.82
									May-20	3.28	2.68	686.26
									Jun-21	3.441	2.84	686.10
									Jun-22	3.7	3.10	685.84
					0.57				Jun-23	3.838	3.27	685.70
MW21A	404786.1	5906389.7	687.60	688.30	0.69	9.98	8.48	9.98	May-14	5.01	4.32	683.29
									May-15	5.00	4.31	683.31
									May-16	4.21	3.52	684.09
									May-17	4.98	4.29	683.33
									Jun-18	4.05	3.36	684.25
									Jun-19	5.26	4.57	683.05
									May-20	5.02	4.33	683.29
					0.61				Jun-21	4.11	3.50	684.19
					0.69				Jun-22	4.60	3.91	683.70
					0.68				Jun-23	4.15	3.47	684.16
MW22A	404852.8	5906350.6	687.83	688.66	0.84	9.82	8.32	9.82	May-14	4.69	3.85	683.97
									May-15	4.76	3.92	683.90
									May-16	5.06	4.22	683.60
									May-17	5.03	4.19	683.63
									Jun-18	4.84	4.00	683.82
									Jun-19	5.22	4.38	683.44
									May-20	5.17	4.33	683.50
					0.82				May-21	4.30	3.48	684.37
					0.80				Jun-22	4.81	4.01	683.85
					0.81				Jun-23	4.71	3.90	683.96
MW23A	404898.6	5906361.7	686.45	687.16	0.67	9.99	8.49	9.99	May-14	0.89	0.22	686.28
									May-15	1.01	0.34	686.15
									May-16	1.03	0.36	686.13
									May-17	0.98	0.31	686.18
									Jun-18	1.11	0.44	686.05
									Jun-19	1.19	0.52	685.97
									May-20	1.15	0.48	686.01
					0.64				May-21	1.21	0.57	685.95
					0.66				Jun-22	1.23	0.57	685.93
					0.67				Jun-23	1.51	0.84	685.66
MW24A Decommissioned July 2018	-	-	688.88	689.68	0.70	9.80	8.30	9.80	May-14	3.53	2.83	686.14
									May-15	3.33	2.63	686.34
									May-16	3.59	2.89	686.09
									May-17	3.21	2.51	686.47
									Jun-18	3.57	2.87	686.11

Table 3c: Groundwater Monitoring Results - Clay Shale

Monitoring Well	UTM Coordinates		Elevations		Measured Stick-up (m)	Well Depth (mbgl	Screened Interval		Date	Water Depth		Groundwater Elevation (mAMSL)
	Easting	Northing	Surface (mAMSL)	Top of Pipe (mAMSL)			Top Screen Depth (mbgl)	Bottom Screen Depth (mbgl)		mBTOP	mbgl	
MW25A	404967.5	5906383.0	686.73	687.54	0.82	9.90	8.40	9.90	May-14	1.08	0.26	686.46
									May-15	1.15	0.33	686.39
									May-16	1.32	0.50	686.22
									May-17	1.25	0.43	686.29
					0.59				Jun-18	1.37	0.78	686.17
									Jun-19	1.44	0.85	686.10
					0.49				May-20	1.14	0.65	686.40
									May-21	1.42	1.42	686.12
					0.53				Jun-22	1.42	0.89	686.12
					0.63				Jun-23	1.29	0.66	686.24
MW26A	405056.1	5906388.1	687.00	687.60	0.56	10.17	8.67	10.17	May-14	1.89	1.34	685.70
									May-15	1.83	1.28	685.76
									May-16	2.09	1.53	685.51
									May-17	2.04	1.48	685.56
					0.49				Jun-18	2.11	1.62	685.48
									Jun-19	2.27	1.78	685.32
									May-20	2.03	1.54	685.57
					0.56				May-21	1.75	1.19	685.84
					0.50				Jun-22	1.80	1.30	685.80
					0.55				Jun-23	1.89	1.34	685.70
MW27A	405212.0	5906397.2	686.65	687.19	0.53	10.44	8.94	10.44	May-14	0.32	-0.21	686.87
									May-15	0.33	-0.20	686.86
									May-16	0.43	-0.10	686.76
									May-17	0.50	-0.03	686.69
					0.48				Jun-18	0.57	0.09	686.62
									Jun-19	0.69	0.21	686.50
									May-20	0.42	-0.06	686.77
					0.47				May-21	0.37	-0.10	686.82
					0.52				Jun-22	0.49	-0.03	686.70
					0.50				Jun-23	0.53	0.03	686.67
MW28A	405317.2	5906379.9	687.36	687.96	0.59	11.18	9.68	11.18	May-14	2.39	1.80	685.57
									May-15	2.18	1.59	685.78
									May-16	2.24	1.65	685.71
									May-17	2.01	1.42	685.95
									Jun-18	2.04	1.45	685.92
									Jun-19	2.07	1.48	685.89
									May-20	1.89	1.30	686.07
									May-21	1.98	1.39	685.98
									Jun-22	1.97	1.38	685.99
									Jun-23	2.32	1.73	685.64
MW32A	405527.8	5906577.5	686.53	687.19	0.65	9.47	7.47	9.47	May-15	2.62	1.97	684.58
									May-16	2.32	1.67	684.87
									May-17	2.25	1.60	684.95
									Jun-18	2.30	1.65	684.90
									Jun-19	1.91	1.26	685.28
									May-20	1.53	0.88	685.66
					0.61				May-21	2.14	1.53	685.05
					0.67				Jun-22	1.54	0.87	685.65
					0.63				Jun-23	2.15	1.52	685.05
15MW34A Decommissioned July 2018	405098.2	5906742.6	687.98	689.02	1.05	11.94	10.20	11.94	Aug-15	5.42	4.38	683.59
									May-16	3.63	2.59	685.38
									May-17	3.40	2.35	685.62
					0.94				Jun-18	3.66	2.72	685.35
15MW35A	404801.2	5906265.6	688.46	689.32	0.85	13.71	11.70	13.71	Aug-15	11.68	10.83	677.64
									May-16	7.71	6.86	681.61
									May-17	7.55	6.70	681.77
									Jun-18	7.85	7.00	681.47
									Jun-19	7.69	6.84	681.62
									May-20	8.50	7.65	680.82
									Jun-21	8.99	8.14	680.33
									Jun-22	8.98	8.13	680.34
					0.86				Jun-23	8.87	8.87	680.45
15MW36A	405551.7	5906435.9	687.05	687.95	0.85	14.98	12.70	14.98	Aug-15	4.05	3.20	683.89
									May-16	3.98	3.13	683.97
									May-17	3.16	2.31	684.78
					0.55				Jun-18	3.08	2.53	684.87
									Jun-19	2.84	2.29	685.11
									May-20	2.60	2.05	685.34
									Jun-21	2.57	2.02	685.38
					0.51				Jun-22	2.41	1.90	685.54
					0.62				Jun-23	2.59	1.97	685.35
19MW37A Decommissioned June 27, 2023	1260.72	1003.78	686	686.94	0.9	13.419	10.419	13.419	Jun-19	2.465	1.57	684.48
									May-20	1.194	0.29	685.75
					0.89				Jun-21	1.132	0.24	685.81
					0.91				Jun-22	1.25	0.34	685.69
					0.91				May-23	1.965	1.06	684.98
19MW38A Decommissioned October 24, 2022	1456.1	995.81	687.09	687.97	0.87	14.773	11.773	14.773	Jun-19	1.338	0.47	686.63
									May-20	1.872	1.00	686.10
					0.80				Jun-21	1.604	0.73	686.37
					0.89				Jun-22	1.91	1.91	686.06
23MW38A	-	-	-	-	0.96	13.34	10.14	13.19	Dec-23	13.54	12.58	-

Notes:
Monitoring well network re-surveyed on July 30, 2015.
mAMSL - metres above mean sea level.
mbgl - metres below ground level.
mBTOP - metres below top of pipe.
-' - no information available.
negative water level = water level above ground level.

Table 3d: Groundwater Monitoring Results - Lower Bedrock

Monitoring Well	UTM Coordinates		Elevations		Measured Stick-up (m)	Well Depth (mbgl	Screened Interval		Date	Water Depth		Groundwater Elevation (mAMSL)
	Easting	Northing	Surface (mAMSL)	Top of Pipe (mAMSL)			Top Screen Depth (mbgl)	Bottom Screen Depth (mbgl)		mBTOP	mbgl	
15MW35-Deep	404801.4	5906263.8	688.43	689.32	0.85	32.59	31.00	32.59	Aug-15	7.04	6.19	682.28
									May-16	6.88	6.03	682.44
									May-17	6.64	5.79	682.68
									Jun-18	6.51	5.66	682.81
									Jun-19	6.421	5.57	682.90
									May-20	7.54	6.69	681.78
					0.91				Jun-21	8.99	8.08	680.33
					0.83				Jun-22	7.34	6.51	681.98
					0.92				Jun-23	7.23	6.31	682.09
15MW36-Deep	405551.7	5906435.9	687.03	687.79	0.74	34.64	33.6	34.64	Aug-15	22.77	22.03	665.02
									May-16	5.92	5.18	681.87
									May-17	5.78	5.04	682.01
					0.44				Jun-18	5.21	4.77	682.57
									Jun-19	4.93	4.49	682.86
									May-20	4.71	4.27	683.07
					0.43				Jun-21	4.64	4.21	683.15
					0.44				Jun-22	5.77	5.33	682.02
					0.46				Jun-23	4.51	4.05	683.27
16MW09A	405586	5907524	685.16	686.20	0.89	37.96	35.73	36.73	Jun-22	6.56	5.67	679.64
									May-23	6.53	5.64	679.67
16MW11A	404816	5907540	685.96	686.89	0.91	38.09	35.88	36.88	Jun-22	5.01	4.10	681.88
									May-23	4.99	4.08	681.90

Notes:
Monitoring well network re-surveyed on July 30, 2015.
mAMSL - metres above mean sea level.
mbgl - metres below ground level.
mBTOP - metres below top of pipe.
-' - no information available.

Table 4a: Field and Groundwater Analytical Results Summary - Surficial Material Wells

Parameter Group		Field			Routine																	Nutrients					Hydrocarbons											Organics		
Parameter		pH	Electrical Conductivity	Temperature	pH	Electrical Conductivity	Total Dissolved Solids	Hardness	Alkalinity, total (as CaCO3)	Bicarbonate	Carbonate	Hydroxide	Calcium	Magnesium	Potassium	Sodium	Chloride	Fluoride	Sulphate	Ionic Balance	Ammonia-N	Nitrate (N)	Nitrite (N)	Nitrate and Nitrate (N)	Total Kjeldahl Nitrogen	Benzene	Toluene	Ethylbenzene	Xylenes (m & p)	Xylene (o)	Xylenes	Styrene	F1 (C6-C10)	F1-BTEX	F2 (C10-C16)	Total Phenols	Chemical Oxygen Demand	Dissolved Organic Carbon
Unit		pH Units			pH Units	µS/cm	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	-	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		6.5-8.5	1000	-	6.5-8.5	1000	500	-	-	-	-	-	-	-	-	200	100	1	128-429	-	0.018-190	3	0.02-0.20	100	-	0.005	0.024	0.0016	-	-	0.02	0.072	2.2	2.2	1.1	-	-	-
Monitoring Well	Date																																							
MW10	30-May-2014	8.3	**4920**	4.2	8.12	**4600**	**3500**	-	-	600	<0.50	-	68	35	4.0	**990**	26	-	**2100**	-	0.17	0.079	-	-	0.68	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	33	9.6
	28-May-2015	8.3	**4980**	7.5	7.79	**4700**	**3400**	520	490	590	<0.50	<0.50	140	44	4.5	**910**	**140**	-	**1900**	0.95	0.23	0.014	<0.010	0.014	0.68	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	35	11
	8-Jun-2016	8.06	**4420**	9.8	8.26	**4500**	**3000**	280	500	620	<0.50	<0.50	60	31	4.4	**840**	60	-	**1700**	0.9	0.16	0.04	0.01	0.05	0.57	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	32	9.7
	7-Jun-2017	8.0	**4260**	10.3	8.11	**4100**	**3000**	310	520	630	<0.50	<0.5	71	32	4.2	**870**	59	-	**1600**	2.0	0.052	3.0	<0.16	-	0.49	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	24	8
	26-Jun-2018	7.70	**4530**	8.5	8.27	**4100**	**3000**	300	530	650	<1.0	<1.0	68	32	4.0	**910**	55	-	**1600**	1.3	0.06	0.13	<0.010	0.13	0.49	<0.00040	<0.00040	<0.00040	-	-	<0.00089	<0.00050	-	<0.10	<0.10	<0.002	28	8.6
	12-Jun-2019	7.38	**4240**	11.2	8.14	**4300**	**3000**	280	540	660	<1.0	<1.0	73	24	4.2	**940**	65	-	**1600**	1.1	0.3	0.057	<0.010	0.057	0.58	<0.00040	<0.00040	<0.00040	<0.00080	<0.00040	<0.00089	<0.00050	<0.10	<0.10	<0.0015	31	17
	29-May-2020	7.67	**2950**	5.5	8.14	**4300**	**3100**	280	540	660	<1.0	<1.0	70	26	3.7	**960**	74	-	**1600**	0.51	0.17	0.11	<0.01	0.11	0.61	<0.00040	<0.00040	<0.00040	<0.0008	0.0004	<0.00089	<0.00050	<0.1	<0.1	<0.10	<0.0015	34	9
	4-Jun-2021	7.55	**4020**	9.3	8.34	**3800**	**3160**	280	538	648	<5.0	<5.0	68.1	26.6	3.93	**911**	68.1	0.57	**1760**	92.1	0.210	<0.10	<0.050	<0.11	0.72	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00071	<0.00050	<0.10	<0.10	<0.10	<0.0010	36	10.8
	9-Jun-2022	6.95	**4990**	9.6	8.39	**4100**	**3100**	282	598	708	10.3	<1.0	69.8	26.1	3.91	**903**	62.5	0.491	**1650**	93.6	0.152	<0.10	<0.050	<0.112	0.516	<0.00050	<0.00050	<0.00050	<0.00030	<0.00040	<0.00050	<0.00050	<0.10	<0.10	<0.10	<0.0010	29	11.2
	15-Jun-2023	7.89	**4020**	13	8.43	**3,440**	**2,980**	279	500	585	12.2	<1.0	67.3	27	4.28	**915**	68.4	0.421	**1,580**	102	0.182	<0.200	<0.100	<0.224	0.473	<0.00050	<0.00050	<0.00050	<0.00040	<0.00030	<0.00050	<0.00050	<0.10	<0.100	<0.10	<0.0010	32	10.9
MW18B	30-May-2014	7.6	**2920**	8.9	8.27	**2900**	**2300**	-	-	350	<0.50	-	120	33	3.7	**510**	14	-	**1400**	-	0.09	0.2	-	-	0.68	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	27	7.3
	28-May-2015	8.0	**3800**	5.9	7.79	**3600**	**2800**	670	330	410	<0.50	<0.50	190	47	4.6	**670**	17	-	**1700**	1.0	0.14	0.13	0.011	0.14	1.5	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	64	9.2
	8-Jun-2016	**6.00**	**4240**	8.3	7.96	**3400**	**2600**	630	320	390	<0.50	<0.50	180	45	4.5	**570**	22	-	**1500**	0.96	0.10	0.089	0.015	0.10	0.32	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	30	8.2
	7-Jun-2017	7.4	**3160**	8.0	8.05	**3000**	**2200**	660	620	760	<0.50	<0.5	180	48	4.4	**530**	29	-	**1100**	1.8	0.17	0.36	0.037	-	0.87	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	24	11
	26-Jun-2018	7.4	**3500**	8.7	7.89	**3300**	**2400**	740	650	800	<1.0	<1.0	210	55	4.7	**560**	44	-	**1100**	1.9	0.072	0.17	<0.010	0.17	1.1	<0.00040	<0.00040	<0.00040	-	-	<0.00089	<0.00050	-	<0.10	<0.10	<0.002	49	12
	12-Jun-2019	7.25	**2840**	11.2	7.96	**2800**	**1900**	620	530	650	<1.0	<1.0	180	42	4.1	**420**	53	-	**910**	0.32	0.25	0.13	<0.010	0.13	0.74	<0.00040	<0.00040	<0.00040	<0.00080	<0.00040	<0.00089	<0.00050	<0.10	<0.10	<0.10	0.0032	29	9.9
	4-Jun-2020	7.06	**2950**	8.7	7.68	**2900**	**2000**	720	750	910	<1.0	<1.0	200	54	4.2	**460**	**130**	-	**720**	1.2	0.17	0.15	<0.010	0.15	0.94	<0.00040	<0.00040	<0.00040	<0.0008	<0.0004	<0.00089	<0.00050	<0.1	<0.10	<0.10	<0.0015	36	15
	4-Jun-2021	7.21	**2640**	9.7	8.03	**2390**	**1920**	701	571	696	<5.0	<5.0	167	44.3	3.36	**399**	74.6	0.252	**892**	91.8	0.164	0.093	<0.020	0.093	0.56	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00071	<0.00050	<0.10	<0.10	<0.10	0.0013	43	14.5
	10-Jun-2022	7.6	**2120**	7.3	8.29	**1760**	**1300**	347	328	401	<1.0	<1.0	96.5	25.7	2.79	**298**	24.7	0.237	**627**	98.5	0.0424	0.052	<0.010	0.052	0.618	<0.00050	<0.00050	<0.00050	<0.00030	<0.00040	<0.00050	<0.00050	<0.10	<0.10	<0.10	<0.0010	22	10.2
	15-Jun-2023	7.49	**2100**	13	8.24	**1,790**	**1,510**	447	282	344	<1.0	<1.0	120	35.7	3.33	**340**	28.4	0.253	**791**	104	0.048	0.119	<0.050	0.119	0.449	<0.00050	<0.00050	<0.00050	<0.00040	<0.00030	<0.00050	<0.00050	<0.10	<0.100	<0.10	<0.0010	21	7.52
MW19B	30-May-2014	7.5	**6080**	8.3	8.33	**6000**	**4700**	-	-	1100	5.0	-	29	20	6.7	**1500**	2.6	-	**2600**	-	0.76	<0.010	-	-	1.1	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	28	5
	28-May-2015	8.4	**6260**	6.5	8.26	**5900**	**4500**	150	900	1100	<0.50	<0.50	32	17	7.4	**1500**	3.1	-	**2400**	0.98	**0.76**	<0.010	<0.010	<0.010	1.1	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	17	5.7
	8-Jun-2016	8.09	**7170**	-	8.43	**5700**	**4100**	150	860	1000	13	<0.50	31	17	7.6	**1300**	3.1	-	**2200**	0.96	**0.73**	0.015	0.013	0.028	0.1	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	17	6.0
	7-Jun-2017	8.2	**6430**	7.0	8.5	**5800**	**4100**	150	910	1100	22	<0.5	29	18	7.5	**1400**	2.7	-	**2000**	3.6	**0.84**	<0.044	**0.11**	-	1.0	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	17	6.3
	26-Jun-2018	8.2	**6100**	8.0	8.3	**5800**	**4300**	150	910	1100	<1.0	<1.0	30	17	7.7	**1400**	2.8	-	**2200**	0.54	0.63	0.038	0.012	0.049	1.1	<0.00040	<0.00040	<0.00040	-	-	<0.00089	<0.00050	-	<0.10	<0.10	<0.002	34	6.1
	12-Jun-2019	8.23	**6010**	12.3	8.46	**5900**	**3600**	130	900	1000	33.0	<1.0	26	17	7.3	**930**	3.3	-	**2100**	18	**0.63**	0.026	0.011	0.036	1.2	<0.00040	<0.00040	<0.00040	<0.00080	<0.00040	<0.00089	<0.00050	<0.10	<0.10	<0.10	<0.0015	33	5.3
	4-Jun-2020	8.48	**6440**	7.6	8.3	**6300**	**4800**	170	920	1100	4.8	<1.0	33	21	7.8	**1600**	5	-	**2500**	2.9	**0.81**	0.024	0.01	0.034	0.94	<0.00040	<0.00040	<0.00040	<0.00080	<0.00040	<0.00089	<0.00050	<0.10	<0.10	<0.10	<0.0015	18	6.6
	4-Jun-2021	8.44	**6040**	9.9	**8.69**	**5790**	**4940**	160	910	1020	42.8	<5.0	27.5	22.1	8.5	**1630**	3.8	0.15	**2700**	99.9	**0.74**	<0.10	<0.050	<0.11	0.87	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00071	<0.00050	<0.10	<0.10	<0.10	0.0021	26	7.5
	10-Jun-2022	8.58	**7310**	10.3	**8.76**	**6000**	**4840**	123	1060	1180	55.4	<1.0	17.4	19.4	7.39	**1540**	3.65	0.136	**2590**	92.7	**0.745**	<0.10	<0.050	<0.112	1.08	<0.00050	<0.00050	<0.00050	<0.00030	<0.00040	<0.00050	<0.00050	<0.10	<0.10	<0.10	<0.0010	26	7.8
	15-Jun-2023	**8.75**	**6110**	11.3	**8.95**	**5,220**	**4,580**	128	881	918	77.5	<1.0	18.8	19.8	8.8	**1,510**	<5.00	<0.200	**2,470**	99.3	**0.906**	<0.200	<0.100	<0.224	1.17	<0.00050	<0.00050	<0.00050	<0.00040	<0.00030	<0.00050	<0.00050	<0.10	<0.100	<0.10	<0.0010	29	7.71
MW20B	30-May-2014	7.9	**5320**	7.9	8.02	**4900**	**3800**	-	-	950	<0.50	-	130	47	9.4	**1000**	1.3	-	**2200**	-	0.058	0.27	-	-	3.0	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	96	7.2
	28-May-2015	7.9	**5030**	5.5	8.04	**4700**	**3500**	450	810	990	<0.50	<0.50	120	39	9.0	**1000**	1.5	-	**1900**	0.98	<0.050	0.17	<0.010	0.17	3.7	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	120	6.4
	8-Jun-2016	7.64	**4970**	7.3	8.04	**4700**	**3500**	430	880	1100	<0.50	<0.50	110	37	9.0	**1000**	1.4	-	**1800**	0.96	<0.050	0.14	<0.010	0.14	0.29	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	15	4.3
	7-Jun-2017	7.6	**5180**	6.2	8.17	**5000**	**3700**	570	790	960	<0.50	<0.5	140	50	9.8	**1100**	1.1	-	**1900**	4.5	0.035	0.86	<0.033	-	0.74	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	81	6
	26-Jun-2018	7.3	**5300**	5.5	8.10	**4800**	**3500**	480	810	990	<1.0	<1.0	120	42	9.3	**1100**	41.0	-	**1800**	1.2	<0.015	0.079	<0.010	0.079	0.41	<0.00040	<0.00040	<0.00040	-	-	<0.00089	<0.00050	-	<0.10	<0.10	<0.002	32	6
	12-Jun-2019	7.51	**4810**	8.5	8.10	**4700**	**3300**	440	850	1000	<1.0	<1.0	120	36	8.7	**1100**	1.2	-	**1600**	5.6	0.051	0.14	0.011	0.15	0.61	<0.00040	<0.00040	<0.00040	<0.00080	<0.00040	<0.00089	<0.00050	<0.10	<0.10	<0.10	<0.0015	32	5.8
	4-Jun-2020	7.56	**5860**	5.6	7.90	**5700**	**4600**	770	710	870	<1.0	<1.0	200	65	10	**1300**	2.2	-	**2600**	1.6	0.035	0.33	<0.010	0.33	1.0	<0.00040	<0.00040	<0.00040	<0.00080	<0.00040	<0.00089	<0.00050	<0.10	<0.10	<0.10	<0.0015	27	12
	3-Jun-2021	7.67	**6370**	7.0	8.03	**5600**	**6020**	146	658	801	<5.0	<5.0	364	135	15.7	**1610**	<2.5	0.34	**3520**	116	<0.050	0.69	<0.050	0.69	2.1	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00071	<0.00050	<0.10	<0.10	<0.10	<0.0015	95	23.7
	10-Jun-2022	7.54	**8050**	6.8	7.99	**6370**	**5790**	1240	730	891	<1.0	<1.0	306	117	12.5	**1330**	<2.5	0.41	**3530**	94.2	<0.0050	1.02	<0.050	1.02	1.8	<0.00050	<0.00050	<0.00050	<0.00030	<0.00040	<0.00050	<0.00050	<0.10	<0.10	<0.10	<0.0010	85	33
	15-Jun-2023	7.80	**6370**	10.1	8.12	**5,480**	**5,930**	1,300	547	668	<1.0	<1.0	313	126	14.1	**1,440**	<10.0	<0.400	**3,660**	102	0.0111	0.562	<0.200	0.562	1.13	<0.00050	<0.00050	<0.00050	<0.00040	<0.00030	<0.00050	<0.00050	<0.10	<0.100	<0.10	<0.0010	83	27.8
MW21B	30-May-2014	8.0	**2870**	6.6	8.21	**2700**	**1800**	-	-	1000	<0.50	-	17	5.6	4	**610**	1.5	-	**650**	-	<0.050	<0.010	-	-	0.34	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	31	3.8
	28-May-2015	8.3	**2820**	6.9	8.16	**2700**	**1800**	61	860	1000	<0.50	<0.50	16	4.9	4.2	**630**	1.6	-	**570**	0.99	<0.050	0.11	<0.010	0.11	0.28	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	20	4.2
	8-Jun-2016	7.89	**2840**	6.5	8.25	**2600**	**1700**	61	850	1000	<0.50	<0.50	16	5.0	3.9	**630**	1.1	-	**530**	1.0	<0.050	0.11	<0.010	0.11	<0.05	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	20	4.4
	7-Jun-2017	7.8	**2780**	6.5	8.39	**2600**	**1800**	64	860	1000	9.2	<0.5	17	5.3	4.1	**640**	1.1	-	**570**	1.56	0.016	0.19	<0.033	-	0.31	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	20	6.1
	26-Jun-2018	-	-	-	8.29	**2900**	**1900**	72	870	1100	<1.0	<1.0	19	6.1	4.2	**680**	1.3	-	**650**	0.26	<0.015	0.1	<0.010	0.1	0.31	<0.00040	<0.00040	<0.00040	-	-	<0.00089	<0.00050	-	<0.10	<0.10	<0.002	27	6.5
	17-Jun-2019	7.86	**2870**	7.3	8.44	**2900**	**1900**	74	840	970	26.0	<1.0	20	5.9	4	**670**	1.7	-	**660**	0.046	0.034	0.12	<0.010	0.12	0.32	<0.00040	<0.00040	<0.00040	<0.00080	<0.00040	<0.00089	<0.00050	<0.10	<0.10	<0.10	<0.0015	30	5.9
	5-Jun-2020	7.67	**3010**	6.1	8.36	**2900**	**1900**	83	780	940	9.4	<1.0	22	6.8	4.3	**730**	2.0	-	**720**	4.3	<0.015	0.096	<0.010	0.096	0.31	<0.00040	<0.00040	<0.00040	<0.00080	<0.00040	<0.00089	<0.00050	<0.10	<0.10	<0.10	<0.0015	23	6.2
	3-Jun-2021	7.91	**2830**	7.3	**8.54**	**2700**	**2120**	92.1	822	961	20.6	<5.0	24.3	7.63	5.1	**808**	<2.5	0.35	**776**	114	<0.050	0.14	<0.050	0.14	0.27	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00071	<0.00050	<0.10	<0.10	<0.10	<0.0010	29	6.8
	10-Jun-2022	7.7	**3580**	10.3	**8.47**	**2940**	**2110**	79.8	957	1130	18.4	<1.0	20.7	6.83	4.2	**680**	<1.0	0.415	**806**	87.2	0.192	0.063	<0.020	0.063	0.404	<0.00050	<0.00050	<0.00050	<0.00030	<0.00040	<0.00050	<0.00050	<0.10	<0.10	<0.10	<0.0010	24	7.1
	15-Jun-2023	7.90	**3090**	10.9	**8.78**	**2,720**	**2,140**	89.6	798	886	43.2	<1.0	23	7.81	4.84	**768**	<2.50	0.361	**639**	106	0.0764	<0.100	<0.050	<0.112	0.248	<0.00050	<0.00050	<0.00050	<0.00040	<0.00030	<0.00050	<0.00050	<0.10	<0.100	<0.10	0.0024	26	6.71
MW22B	30-May-2014	7.7	**8560**	6.4	8.07	**8100**	**6800**	-	-	1200	<0.50	-	110	51	8.5	**2100**	1.3	-	**3900**	-	<0.050	0.11	-	-	0.36	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	15	5.3
	28-May-2015	7.8	**8250**	8.4	7.86	**8200**	**6400**	520	1000	1200	<0.50	<0.50	120	55	10	**1900**	1.8	-	**3900**	0.92	<0.050	0.16	<0.010	0.16	0.52	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	51	5.7
	8-Jun-2016	7.57	**8780**	9.7	7.97	**8200**	**6600**	510	1000	1300	<0.50	<0.50	110	55	10	**2000**	1.4	-	**3900**	0.95	<0.050	<0.010	<0.010	<0.020	0.27	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	18	4.7
	7-Jun-2017	7.5	**7870**	7.8	8.23	**8000**	**6000**	490	1000	1200	<0.50	<0.5	110	54	9.8	**2000**	1.9	-	**3300**	4.0	0.04	0.38	<0.16	-	0.32	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	20	6.6
	26-Jun-2018	7.63	**8750**	6.7	7.98	**8000**	**6300**	460	1000	1200	<1.0	<1.0	110	53	9.4	**1900**	1.7	-	**3400**	2.9	0.015	0.039	<0.010	0.039	0.28	<0.00040	<0.00040	<0.00040	-	-	<0.00089	<0.00050	-	<0.10	<0.10	<0.002	23	5.9
	17-Jun-2019	7.6	**8040**	10.3	8.27	**8000**	**6100**	480	1000	1200	<1.0	<1.0	110	51	9.3	**2000**	2.7	-	**3300**	3.8	0.031	0.094	<0.010	0.094	0.49	<0.00040	<0.00040	<0.00040	<0.00080	<0.00040	<0.00089	<0.00050	<0.10	<0.10	<0.10	<0.0015	44	6.7
	5-Jun-2020	7.54	**8180**	7.9	8.11	**8100**	**6400**	530	960	1200	<1.0	<1.0	120	57	9.4	**2100**	2.7	-	**3600**	3.2	0.021	0.096	<0.010	0.096	0.38	<0.00040	<0.00040	<0.00040	<0.00080	<0.00040	<0.00089	<0.00050	<0.10	<0.10	<0.10	<0.0015	16	6.1
	3-Jun-2021	7.72	**7420**	9.3	8.26	**6600**	**6600**	487	990	1210	<5.0	<5.0	107	53.4	9.45	**1920**	<5.0	0.3	**4000**	90.7	0.055	<0.20	<0.10	<0.22	0.32	<0.00050	<0.00050	<0.00050	<0.00030	<0.00040	<0.00071	<0.00050	<0.10	<0.10	<0.10	<0.0010	47	5.9
	10-Jun-2022	7.34	**9550**	8.1	8.24	**7730**	**6550**	512	1180	1440	<1.0	<1.0	112	56.5	9.23	**1910**	<2.5	0.272	**3730**	92.7	<0.0050	<0.10	<0.050	<0.112	0.306	<0.00050	<0.00050	<0.00050	<0.00030	<0.00040	<0.00050	<0.00050	<0.10	<0.10	<0.10	<0.0010	22	6.9
	16-Jun-2023	8.10	**7000**	11	8.45	**6,610**	**6,440**	533	920	1,080	19.3	<1.0	113	60.9	10.1	**2,020**	<10.0	<0.400	**3,670**	104	0.0156	<0.400	<0.200	<0.447	0.364	<0.00050	<0.00050	<0.00050	0.00041	<0.00030	<0.00050	<0.00050	<0.10	<0.100	<0.10	<0.0010	20	6.22

Notes:
[1] Alberta Environment and Parks (AEP). 2022. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. ISBN 978-1-4601-5501-1. Referenced guidelines are for fine textured soils under Agricultural land use
[2] Alberta Environment and Parks (AEP). Environmental Quality Guidelines for Alberta Surface Waters. March 2018. Table 1 Surface water quality guidelines for the protection of freshwater aquatic life (PAL). Most conservative values applied (chronic or acute).
[3] Guideline varies with hardness.
[4] Guideline varies with pH and temperature.
[5] Guideline varies with chloride.
[6] Guideline varies with pH.
"-" No applicable guideline or not analyzed.
BOLD - Greater than Tier 1 Guideline.
#e/c - Detection limit greater than Tier 1 guideline.

TETRA TECH

Table 4a: Field and Groundwater Analytical Results Summary - Surficial Material Wells

Parameter Group		Field			Routine																	Nutrients					Hydrocarbons											Organics		
Parameter		pH	Electrical Conductivity	Temperature	pH	Electrical Conductivity	Total Dissolved Solids	Hardness	Alkalinity, total (as CaCO3)	Bicarbonate	Carbonate	Hydroxide	Calcium	Magnesium	Potassium	Sodium	Chloride	Fluoride	Sulphate	Ionic Balance	Ammonia-N	Nitrate (N)	Nitrite (N)	Nitrate and Nitrate (N)	Total Kjeldahl Nitrogen	Benzene	Toluene	Ethylbenzene	Xylenes (m & p)	Xylene (o)	Xylenes	Styrene	F1 (C6-C10)	F1-BTEX	F2 (C10-C16)	Total Phenols	Chemical Oxygen Demand	Dissolved Organic Carbon
Unit		pH Units			pH Units	µS/cm	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	-	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		6.5-8.5	1000	-	6.5-8.5	1000	500	-	-	-	-	-	-	-	-	200	100	1	128-429	-	0.018-190	3	0.02-0.20	100	-	0.005	0.024	0.0016	-	-	0.02	0.072	2.2	2.2	1.1	-	-	-
Monitoring Well	Date																																							
MW29B	28-May-2015	7.4	**8670**	7.1	7.62	**8200**	**7200**	2300	470	570	<0.50	<0.50	520	260	12	**1400**	5.7	-	**4700**	1.0	0.72	0.39	0.027	0.42	4.5	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	150	17
	8-Jun-2016	7.21	**8800**	7.7	7.85	**8400**	**7700**	2400	420	520	<0.50	<0.50	560	230	11	**1600**	5.2	-	**5100**	1.0	1.1	0.11	0.025	0.13	0.96	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	41	15
	7-Jun-2017	7.2	**9230**	6.0	7.90	**8500**	**7400**	2300	450	550	D<0.5	<0.50	530	240	11	**1600**	6.0	-	**4700**	4.6	1.4	<0.22	<2.16	-	1.8	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	45	18
	26-Jun-2018	6.90	**8620**	9.0	7.76	**8600**	**7800**	2400	460	560	<1.0	<1.0	530	260	12	**1700**	6.3	-	**5000**	3.5	1.2	0.13	0.032	0.17	1.9	<0.00040	<0.00040	<0.00040	-	-	<0.00089	<0.00050	-	<0.10	<0.10	<0.002	76	14
	17-Jun-2019	7.20	**8700**	9.1	7.88	**8900**	**7600**	2200	470	570	<1.0	<1.0	440	260	10	**1700**	8.2	-	**4900**	1.7	0.91	<0.010	0.079	0.079	1.5	<0.00040	<0.00040	<0.00040	<0.00080	<0.00040	<0.00089	<0.00050	<0.10	<0.10	<0.10	<0.0015	56	17
	4-Jun-2020	7.18	**8840**	7.8	7.34	**8700**	**7900**	2200	470	570	<1.0	<1.0	440	260	11	**1900**	8.6	-	**5000**	4.3	0.81	0.53	0.059	0.59	1.1	<0.00040	<0.00040	<0.00040	<0.00080	<0.00040	<0.00089	<0.00050	<0.10	<0.10	<0.10	<0.0015	34	15
	2-Jun-2021	7.30	**8570**	7.9	7.86	**7630**	**8460**	2230	471	575	<5.0	<5.0	445	272	11.7	**1780**	8.4	0.31	**5660**	95.9	0.512	0.54	<0.10	0.54	1.01	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00071	<0.00050	<0.10	<0.10	<0.10	<0.0010	49	14.5
	10-Jun-2022	7.79	**4960**	10.3	8.19	**8130**	**7860**	2100	560	683	<1.0	<1.0	439	245	11	**1530**	8.05	0.266	**5260**	90.1	0.946	<0.20	<0.10	<0.224	1.81	<0.00050	<0.00050	<0.00050	<0.00030	<0.00040	<0.00050	<0.00050	<0.10	<0.10	<0.10	<0.0010	46	16.2
	16-Jun-2023	7.71	**7700**	8	8.22	**8,770**	**8,030**	2,160	440	537	<1.0	<1.0	404	280	12.4	**1,730**	10.3	<0.400	**5,250**	102	0.411	0.454	<0.200	0.454	1.21	<0.00050	<0.00050	<0.00050	<0.00030	<0.00040	<0.00050	<0.00050	<0.10	<0.100	<0.10	<0.0010	48	15.4
MW30B	28-May-2015	8.1	**2830**	6.5	8.06	**2700**	**1900**	110	550	670	<0.50	<0.50	29	9.1	3.3	**680**	1.4	-	**830**	1.1	0.16	1.3	<0.010	1.3	0.49	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	110	8.4
	8-Jun-2016	8.19	**2650**	7.4	8.44	**2600**	**1800**	100	520	610	8.0	<0.50	26	9.5	3.2	**610**	1.5	-	**830**	1.0	<0.050	0.12	0.012	0.13	0.40	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	44	9.1
	7-Jun-2017	7.9	**2680**	5.6	8.32	**2500**	**1700**	97	530	680	<0.50	<0.5	24	8.9	2.9	**560**	1.8	-	**750**	0.76	<0.015	1.5	<0.033	-	0.6	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	38	10
	26-Jun-2018	7.28	**2500**	8.7	8.27	**2500**	**1700**	87	580	710	<1.0	<1.0	22	8.0	2.6	**610**	<1.0	-	**720**	3.4	<0.015	0.4	<0.010	0.4	0.62	<0.00040	<0.00040	<0.00040	-	-	<0.00089	<0.00050	-	<0.10	<0.10	<0.002	55	8
	17-Jun-2019	7.88	**2470**	8.4	8.26	**2500**	**1600**	88	570	700	<1.0	<1.0	22	8.1	2.6	**570**	1.9	-	**690**	1.4	0.056	0.45	<0.010	0.45	0.62	<0.00040	<0.00040	<0.00040	<0.00080	<0.00040	<0.00089	<0.00050	<0.10	<0.10	<0.10	<0.0015	32	9.6
	29-May-2020	7.67	**2530**	5.9	8.22	**2500**	**1600**	91	540	660	<1.0	<1.0	23	8.2	2.4	**580**	2	-	**700**	2.9	<0.015	0.63	0.017	0.65	0.68	<0.00040	<0.00040	<0.00040	<0.00080	<0.00040	<0.00089	<0.00050	<0.10	<0.10	<0.10	<0.0015	29	8.4
	2-Jun-2021	7.58	**2890**	7.9	8.38	**2230**	**1730**	89	579	692	7.2	<5.0	21.2	8.75	2.87	**599**	<2.5	0.76	**747**	103	<0.050	0.71	<0.050	0.71	0.41	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00071	<0.00050	<0.10	<0.10	<0.10	0.001	24	8.4
	10-Jun-2022	7.7	**2890**	7.5	8.56	**2340**	**1700**	88.6	724	841	21	<1.0	21.2	8.66	2.51	**513**	0.59	0.838	**688**	83.7	<0.0050	0.838	0.012	0.85	0.557	<0.00050	<0.0005	<0.00050	<0.00030	<0.00040	<0.00050	<0.00050	<0.10	<0.10	<0.10	<0.0010	28	9.66
	15-Jun-2023	8.03	**2510**	9	8.5	**2,490**	**1,720**	93	593	692	15.6	<1.0	22.2	9.13	2.82	**575**	<2.50	0.761	**728**	99.6	0.146	0.73	<0.050	0.73	0.5	<0.00050	<0.00050	<0.00050	<0.00030	<0.00040	<0.00050	<0.00050	<0.10	<0.100	<0.10	<0.0010	30	15.4
MW31B	28-May-2015	8.4	**2530**	8.0	8.29	**2400**	**1600**	55	570	690	<0.50	<0.50	15	4.3	3.7	**550**	1.1	-	**670**	0.99	**0.59**	0.046	<0.010	0.046	2.2	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	0.12	<0.10	-	140	9
	8-Jun-2016	8.33	**2500**	9.4	**8.56**	**2500**	**1700**	59	520	610	13.0	<0.50	15	5.4	3.6	**590**	1.4	-	**750**	1.0	0.13	<0.010	<0.010	<0.020	0.38	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	28	8.2
	7-Jun-2017	8.1	**2660**	8.1	8.4	**2500**	**1700**	59	530	640	5.2	<0.50	14	5.6	3.3	**570**	1.4	-	**780**	1.7	0.034	0.8	<0.033	-	0.4	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	30	8.8
	26-Jun-2018	7.55	**2720**	9.5	8.39	**2700**	**1900**	61	530	630	7.2	<1.0	15	5.7	3.4	**660**	<1.0	-	**850**	2.6	<0.015	0.14	<0.010	0.14	0.4	<0.00040	<0.00040	<0.00040	-	-	<0.00089	<0.00050	-	<0.10	<0.10	<0.002	24	7.7
	17-Jun-2019	8.15	**2710**	10.3	8.45	**2800**	**1800**	68	520	610	12	<1.0	17	6.4	3.5	**630**	2.0	-	**850**	1.2	0.02	0.15	<0.010	0.15	0.51	<0.00040	<0.00040	<0.00040	<0.00080	<0.00040	<0.00089	<0.00050	<0.10	<0.10	<0.10	<0.0015	31	10
	5-Jun-2020	7.78	**2750**	7.6	8.29	**2700**	**1900**	73	480	580	<1.0	<1.0	18	7	3.6	**650**	1.6	-	**900**	2.6	0.015	0.17	<0.010	0.17	0.46	<0.00040	<0.00040	<0.00040	<0.00080	<0.00040	<0.00089	<0.00050	<0.10	<0.10	<0.10	<0.0015	33	7.5
	3-Jun-2021	7.92	**2570**	9.8	**8.6**	**2300**	**1900**	71.6	523	607	15.4	<5.0	17.3	6.89	3.63	**638**	<2.5	0.47	**916**	99	<0.050	0.23	<0.050	0.23	0.3	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00071	<0.00050	<0.10	<0.10	<0.10	<0.0010	24	8.2
	10-Jun-2022	8.08	**2280**	8.4	**8.59**	**2700**	**1900**	75	642	739	21.7	<1.0	17.9	7.37	3.56	**597**	<1.0	0.52	**871**	89	0.0306	0.145	<0.020	0.145	0.426	<0.00050	<0.00050	<0.00050	<0.00030	<0.00040	<0.00050	<0.00050	<0.10	<0.10	<0.10	<0.0010	26	9.66
	16-Jun-2023	8.15	**2240**	9.3	**8.82**	**2,680**	**1,860**	67.7	564	620	33.5	<1.0	16.2	6.61	3.72	**626**	<2.50	0.464	**845**	99.3	0.0231	0.155	<0.050	0.155	0.416	<0.00050	<0.00050	<0.00050	<0.00030	<0.00040	<0.00050	<0.00050	<0.10	<0.100	<0.10	<0.0010	26	9.3
MW32B	28-May-2015	7.7	**12,550**	7.6	7.73	**12,000**	**10,000**	930	1100	1300	<0.50	<0.50	210	100	18	**2800**	110	-	**6300**	0.91	1.3	<0.050	<0.050	<0.050	3.5	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	210	18
	8-Jun-2016	7.69	**13,260**	9.1	7.97	**13,000**	**11,000**	1100	1100	1300	<0.50	<0.50	230	120	17	**3200**	120	-	**6800**	0.97	1.5	<0.050	<0.050	<0.020	2.6	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	78	15
	7-Jun-2017	7.4	**13,010**	6.8	7.98	**12,000**	**9800**	950	1000	1300	<0.50	<0.50	210	100	15	**3000**	120	-	**5700**	1.9	1.5	<0.22	<0.16	-	2.3	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	74	17
	26-Jun-2018	7.48	**8330**	9.6	7.82	**12,000**	**11,000**	1000	1000	1300	<1.0	<1.0	220	110	16	**3200**	130	-	**5400**	1.1	1.1	0.14	0.073	0.22	2.0	<0.00040	<0.00040	<0.00040	-	-	<0.00089	<0.00050	-	<0.10	<0.10	0.0024	85	15
	12-Jun-2019	7.5	**12010**	11.7	7.98	**12,000**	**9,700**	930	1000	1200	<1.0	<1.0	220	92	<50	**2900**	130	-	**5700**	0.83	1.3	<0.10	<0.10	<0.14	2.0	<0.00040	<0.00040	<0.00040	<0.00080	<0.00040	<0.00089	<0.00050	<0.10	<0.10	<0.10	0.0027	51	15
	29-May-2020	7.03	**12,220**	8.5	7.92	**12,000**	**8700**	940	930	1100	<1.0	<1.0	245	123	16	**3200**	140	-	**4500**	14	1.5	0.17	0.11	0.28	2.4	<0.00040	<0.00040	<0.00040	<0.00080	<0.00040	<0.00089	<0.00050	<0.10	<0.10	<0.10	<0.0015	68	13
	4-Jun-2021	7.07	**12,000**	7.6	8.1	**10,800**	**12300**	1120	981	1200	<5.0	<5.0	245	123	16	**3440**	146	<0.40	**7720**	93.4	0.931	0.66	<0.20	0.66	2.69	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00071	<0.00050	<0.10	<0.10	<0.10	0.0011	81	15.5
	10-Jun-2022	7.54	**3760**	8.8	8.18	**11,100**	**9940**	895	984	1200	<1.0	<1.0	205	93.1	13.9	**2750**	114	0.302	**6140**	91.4	1.57	0.343	<0.10	0.343	2.1	<0.00050	<0.00050	<0.00050	<0.00030	<0.00040	<0.00050	<0.00050	<0.10	<0.10	<0.10	<0.0010	67	15.4
	16-Jun-2023	7.59	**12,740**	10.5	8.16	**13,100**	**11,400**	1,180	998	1,220	<1.0	<1.0	255	131	17.1	**3,360**	139	<0.400	**6,910**	101	1.87	<0.400	<0.200	<0.447	2.61	<0.00050	<0.00050	<0.00050	<0.00030	<0.00040	<0.00050	<0.00050	<0.10	<0.100	<0.10	<0.0010	52	15.8
MW33B	28-May-2015	7.5	**5180**	6.0	7.89	**5000**	**3700**	340	850	1000	<0.50	<0.50	91	26	6.9	**1200**	21	-	**1900**	1.0	0.83	<0.010	<0.010	<0.010	5.3	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	280	45
	8-Jun-2016	7.48	**5340**	6.9	8.15	**5400**	**4000**	440	820	1100	<0.50	<0.50	110	38	6.9	**1300**	20	-	**2000**	1.0	0.78	<0.050	<0.050	<0.020	2.6	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	140	44
	7-Jun-2017	-	-	-	7.99	**5600**	**4100**	490	1000	1200	<0.50	<0.50	130	42	6.1	**1200**	21	-	**2100**	0.82	**0.6**	0.68	0.2	0.21	2.7	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	150	49
	26-Jun-2018	7.88	**5650**	11.6	7.82	**5500**	**4200**	460	1000	1300	<1.0	<1.0	120	39	6.4	**1300**	22	-	**2100**	1.3	0.44	0.097	0.056	0.15	2.3	<0.00040	<0.00040	<0.00040	-	-	<0.00089	<0.00050	-	<0.10	<0.10	0.0021	120	48
	12-Jun-2019	7.36	**5420**	13	7.96	**5600**	**4000**	490	1000	1200	<1.0	<1.0	130	40	6.6	**1300**	23	-	**1900**	2.4	0.58	0.011	0.023	0.034	2.4	<0.00040	<0.00040	<0.00040	<0.00080	<0.00040	<0.00089	<0.00050	<0.10	<0.10	<0.10	0.0035	150	59
	4-Jun-2020	7.35	**5850**	7.6	7.85	**5800**	**4400**	470	1000	1200	<1.0	<1.0	120	40	6.0	**1400**	23	-	**2200**	4.1	0.82	0.017	0.015	0.032	1.9	<0.00040	<0.00040	<0.00040	<0.00080	<0.00040	<0.00089	<0.00050	<0.10	<0.10	<0.10	<0.0015	116	48
	4-Jun-2021	7.27	**5250**	8.1	8.17	**4850**	**4350**	446	948	1160	<5.0	<5.0	114	39.1	6.4	**1300**	18.5	0.36	**2300**	97.4	0.678	0.1	<0.050	<0.11	2.55	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00071	<0.00050	<0.10	<0.10	<0.10	0.0014	129	45.4
	10-Jun-2022	7.23	**6440**	7.5	8.22	**5330**	**4230**	428	1150	1410	<1.0	<1.0	111	36.6	6.1	**1170**	16.8	0.224	**2130**	88	0.793	0.25	0.095	0.345	2.49	<0.00050	<0.00050	<0.00050	<0.00030	<0.00040	<0.00050	<0.00050	<0.10	<0.10	<0.10	<0.0010	117	47.6
	15-Jun-2023	7.67	**4780**	13	8.40	**5,100**	**3,810**	370	884	1,050	13.9	<1.0	94.8	32.5	6.14	**1,180**	16.9	0.218	**1,890**	102	0.68	<0.200	0.231	0.231	2.88	<0.00050	<0.00050	<0.00050	<0.00040	<0.00030	<0.00050	<0.00050	<0.10	<0.100	<0.10	<0.0010	147	42.3
19MW37B	15-Nov-2019	7.58	**2050**	2.2	7.74	**1900**	**1200**	350	850	1000	<1.0	<1.0	79	36	11	**320**	3.6	-	220	1.6	0.64	<0.010	<0.010	<0.014	3.5	<0.00040	<0.00040	<0.00040	<0.00080	<0.00040	<0.00089	-	<0.10	<0.10	<0.10	<0.0015	189	7.5
	4-Jun-2020	7.25	**1921**	8.2	7.94	**1900**	**1200**	310	820	1000	<1.0	<1.0	73	30	9.3	**370**	3.3	-	230	2.9	0.69	0.011	<0.010	<0.014	0.99	<0.00040	<0.00040	<0.00040	<0.0008	<0.00040	<0.00089	<0.00050	<0.1	<0.10	<0.10	<0.0015	19	8.4
	4-Jun-2021	7.14	**1881**	7.5	8.19	**1750**	**1270**	222	831	1010	<5.0	<5.0	54.8	20.8	7.65	**434**	2.5	0.23	250	108	0.818	<0.020	<0.010	<0.022	1.11	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00071	<0.00050	<0.10	<0.10	<0.10	0.0086	38	9.5
	9-Jun-2022	7.41	**2360**	8.6	8.3	**1920**	**1380**	196	1010	1220	3.4	<1.0	49.5	17.6	7.06	**397**	2.6	0.175	272	82.6	0.901	<0.020	0.02	<0.050	1.51	<0.00050	<0.00050	<0.00050	<0.00030	<0.00040	<0.00050	<0.00050	<0.10	<0.10	<0.10	<0.0010	26	9.34
	15-May-2023	7.15	**2040**	7.6	8.1	**1,840**	**1,260**	298	763	931	<1.0	<1.0	71.2	29.1	8.99	**369**	3.19	0.189	300	103	**0.951**	<0.100	<0.050	<0.112	1.24	<0.00050	<0.00050	<0.00050	<0.00040	<0.00030	<0.00050	<0.00050	<0.10	<0.100	<0.10	0.003	-	8.66
23MW38B	21-Dec-2023	7.60	**1060**	4.3	8.03	**8,960**	**8,290**	734	1020	1250	<1.0	<1.0	153	85.6	18.1	**2,660**	5.55	0.338	**4,720**	110	**1.10**	<0.200	<0.100	<0.224	1.57	<0.00050	<0.00050	<0.00050	<0.00030	<0.00040	<0.00050	<0.00050	<0.10	<0.100	<0.10	<0.0010	-	12.6

Notes:

[1] Alberta Environment and Parks (AEP). 2022. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. ISBN 978-1-4601-5501-1. Referenced guidelines are for fine textured soils under Agricultural land use

[2] Alberta Environment and Parks (AEP). Environmental Quality Guidelines for Alberta Surface Waters. March 2018. Table 1 Surface water quality guidelines for the protection of freshwater aquatic life (PAL). Most conservative values applied (chronic or acute).

[3] Guideline varies with hardness.

[4] Guideline varies with pH and temperature.

[5] Guideline varies with chloride.

[6] Guideline varies with pH.

"-" No applicable guideline or not analyzed.

BOLD - Greater than Tier 1 Guideline.

Italic - Detection limit greater than Tier 1 guideline.

TETRA TECH

Table 4a: Field and Groundwater Analytical Results Summary - Surficial Material Wells

Monitoring Well	Date	Aluminum	Antimony	Arsenic	Barium	Beryllium	Bismuth	Boron	Cadmium	Cesium	Chromium	Cobalt	Copper	Iron	Lead	Lithium	Manganese	Mercury	Molybdenum	Nickel	Phosphorus	Rubidium	Selenium	Silicon	Silver	Strontium	Sulphur	Tellurium	Thallium	Thorium	Tin	Titanium	Tungsten	Uranium	Vanadium	Zinc	Zirconium
Parameter Group		Dissolved Metals																																			
	Unit	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		0.0007-0.05	0.006	0.005	1	-	-	1.0	0.00004-0.00037	-	0.05	-	0.007	0.3	0.001-0.007	-	0.05	0.000005	-	0.007-0.17	-	-	0.002	-	0.0001	-	-	-	-	-	-	-	-	0.01	-	0.03	-
MW10	30-May-2014	-	<0.00060	-	0.016	-	-	-	<0.000025	-	0.0014	-	**0.17**	<0.060	**0.009**	-	-	<0.0000050	-	**0.0078**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.11**	-
	28-May-2015	<0.0030	<0.00060	0.00049	0.087	-	-	0.11	0.000049	-	<0.0010	-	**0.0079**	**8.3**	<0.00020	-	**1.8**	<0.0000050	-	**1.5**	-	-	0.0003	-	<0.00010	-	-	-	-	-	-	-	-	0.0048	-	0.0038	-
	8-Jun-2016	0.0091	<0.00060	0.0006	0.023	-	-	0.12	0.000023	-	0.0021	-	0.0035	<0.060	<0.00020	-	**0.094**	0.0000034	-	0.059	-	-	0.00052	-	<0.00010	-	-	-	-	-	-	-	-	0.0093	-	0.0065	-
	7-Jun-2017	<0.0030	<0.00060	0.00042	0.023	-	-	0.13	0.000021	-	0.0018	-	0.0033	<0.060	<0.00020	-	**0.076**	<0.0000020	-	0.033	-	-	0.00053	-	<0.00010	-	-	-	-	-	-	-	-	0.0086	-	<0.0030	-
	26-Jun-2018	0.0068	<0.00060	0.00059	0.018	-	-	0.11	<0.000020	-	0.0059	-	0.002	<0.06	<0.00020	-	<0.004	0.000005	-	0.02	-	-	0.0006	-	<0.00010	-	-	-	-	-	-	-	-	0.0099	-	<0.0030	-
	12-Jun-2019	<0.0030	<0.00060	0.00072	0.01	<0.0010	-	0.14	<0.000020	-	<0.0010	0.00034	0.0015	<0.060	<0.00020	0.25	**0.088**	<0.0000020	0.0012	0.0095	<0.10	-	<0.00020	4.1	<0.00010	0.88	590	-	<0.00020	-	<0.0010	<0.0010	-	0.0027	<0.0010	0.0031	-
	29-May-2020	<0.0030	<0.00060	0.00061	0.013	<0.001	-	0.11	<0.000020	-	0.0014	0.00066	0.0014	<0.060	<0.00020	0.22	**0.28**	<0.0000019	0.0014	0.011	<0.1	-	0.00041	3.9	<0.0001	0.93	570	-	<0.0002	-	<0.001	<0.001	-	0.0054	<0.001	<0.0030	-
	4-Jun-2021	0.0039	<0.00020	0.00068	0.013	<0.00020	<0.00010	0.121	<0.000010	0.000036	0.00065	0.00044	0.00168	<0.020	<0.00010	0.241	**0.0914**	<0.0000050	0.0013	0.0111	<0.10	0.0046	0.00019	4.22	<0.000020	0.922	573	<0.00040	0.000038	<0.00020	<0.00020	<0.00060	<0.00020	0.00514	<0.0010	0.018	
	9-Jun-2022	0.0094	<0.00050	0.00081	0.017	<0.00010	<0.00025	0.128	<0.000025	<0.000050	<0.0025	<0.00050	0.00364	<0.15	<0.00025	0.23	**0.0775**	-	0.0011	0.0096	<0.25	0.0055	0.000261	4.66	<0.000050	0.942	589	<0.0010	<0.000050	<0.00050	<0.00050	0.00157	<0.00050	0.00516	<0.0025	<0.0050	<0.0015
	15-Jun-2023	0.0105	<0.00050	0.0009	0.0129	<0.000100	<0.000250	0.138	<0.0000250	<0.000050	<0.00050	<0.00050	0.0012	<0.050	<0.000250	0.254	**0.0892**	<0.0000050	0.00174	0.0102	<0.250	0.00596	<0.000250	4.5	<0.000050	0.998	586	<0.00100	<0.000050	<0.00050	<0.00050	<0.00150	<0.00050	0.00463	<0.00250	<0.0050	<0.00100
MW18B	30-May-2014	-	<0.00060	-	0.017	-	-	-	<0.000025	-	<0.0010	-	0.0012	<0.060	<0.00020	-	-	<0.0000050	-	0.0035	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0030	-
	28-May-2015	0.0034	<0.00060	0.0004	0.012	-	-	0.071	<0.000020	-	<0.0010	-	0.0007	<0.060	<0.00020	-	**0.15**	<0.0000050	-	0.0039	-	-	<0.00020	-	<0.00010	-	-	-	-	-	-	-	-	0.0011	-	<0.0030	-
	8-Jun-2016	**0.11**	<0.00060	0.00041	0.014	-	-	0.075	<0.000020	-	<0.0010	-	0.0013	0.25	0.00037	-	0.046	**0.0000068**	-	0.0044	-	-	<0.00020	-	<0.00010	-	-	-	-	-	-	-	-	0.00091	-	0.0047	-
	7-Jun-2017	0.0062	<0.00060	0.00037	0.016	-	-	0.062	<0.000020	-	<0.0010	-	0.00064	<0.060	<0.00020	-	**0.15**	<0.0000020	-	0.004	-	-	<0.00020	-	<0.00010	-	-	-	-	-	-	-	-	0.0044	-	<0.0030	-
	26-Jun-2018	0.004	<0.00060	0.00037	0.015	-	-	0.069	<0.000020	-	<0.0010	-	0.0012	<0.06	<0.00020	-	**0.057**	0.0000035	-	0.0037	-	-	<0.0002	-	<0.00010	-	-	-	-	-	-	-	-	0.0042	-	<0.0030	-
	12-Jun-2019	<0.0030	<0.00060	0.00037	0.016	<0.0010	-	0.058	<0.000020	-	<0.0010	<0.00030	0.0016	<0.060	<0.00020	0.13	**0.085**	<0.0000020	0.00055	0.0035	<0.10	-	<0.00020	4.9	<0.00010	1.3	320	-	<0.00020	-	<0.0010	<0.0010	-	0.0039	<0.0010	<0.0030	-
	4-Jun-2020	<0.0030	<0.00060	0.00035	0.015	<0.001	-	0.05	<0.000020	-	<0.0010	<0.00030	0.0038	<0.060	<0.00020	0.14	**0.11**	<0.0000019	0.00042	0.005	<0.1	-	<0.00020	5.9	<0.00010	1.6	260	-	<0.0002	-	<0.001	<0.001	-	0.0068	<0.001	<0.0030	-
	4-Jun-2021	0.0026	<0.00020	0.00033	0.0133	<0.00020	<0.00010	0.054	0.000012	0.000031	<0.00020	<0.00020	0.00208	<0.020	<0.00010	0.128	**0.055**	<0.0000050	0.00036	0.0036	<0.10	0.00526	0.00012	4.79	<0.000020	1.33	280	<0.00040	<0.000020	<0.00020	<0.00020	<0.00060	<0.00020	0.00607	<0.0010	0.0179	
	10-Jun-2022	0.0015	<0.00010	0.00038	0.0206	<0.000020	<0.000050	0.048	0.0000087	0.000016	<0.00050	0.00029	0.00202	<0.030	<0.000050	0.0796	**0.0574**	-	0.000658	0.00318	<0.050	0.00472	0.000162	4.8	<0.000010	0.802	229	<0.00020	<0.000010	<0.00010	<0.00010	<0.00030	<0.00010	0.00228	<0.00050	0.0013	<0.00030
	15-Jun-2023	<0.0050	<0.00050	<0.00050	0.0138	<0.000100	<0.000250	0.134	<0.0000250	<0.000050	<0.00050	<0.00050	0.00113	<0.050	<0.000250	0.106	**0.0364**	<0.0000050	0.000561	0.00289	<0.250	0.00566	<0.000250	5.06	<0.000050	1.11	289	<0.00100	<0.000050	<0.00050	<0.00050	<0.00150	<0.00050	0.00288	<0.00250	<0.0050	<0.00100
MW19B	30-May-2014	-	<0.0060	-	<0.10	-	-	-	<0.000050	-	<0.010	-	<0.0020	*<0.60*	<0.0020	-	-	<0.0000050	-	<0.0050	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.030	-
	28-May-2015	<0.030	<0.0060	0.0021	0.027	-	-	0.47	<0.00020	-	<0.010	-	<0.0020	**0.36**	<0.0020	-	**0.21**	<0.0000050	-	<0.0050	-	-	<0.0020	-	*<0.0010*	-	-	-	-	-	-	-	-	<0.0010	-	<0.030	-
	8-Jun-2016	<0.0030	<0.00060	0.0025	0.029	-	-	0.48	<0.000020	-	0.0010	-	0.00023	0.21	<0.00020	-	**0.21**	<0.0000020	-	0.0025	-	-	<0.00020	-	<0.00010	-	-	-	-	-	-	-	-	0.00021	-	<0.0030	-
	7-Jun-2017	0.0034	<0.00060	0.0017	<0.10	-	-	0.52	<0.000020	-	<0.0010	-	<0.00020	*<0.6*	<0.00020	-	**0.19**	<0.0000020	-	<0.00050	-	-	<0.00020	-	<0.00010	-	-	-	-	-	-	-	-	0.00024	-	<0.0030	-
	26-Jun-2018	<0.003	<0.00060	0.0017	<0.1	-	-	0.49	<0.000020	-	<0.0010	-	<0.0002	*<0.6*	<0.00020	-	**0.17**	<0.0000020	-	0.00082	-	-	<0.0002	-	<0.00010	-	-	-	-	-	-	-	-	0.00027	-	<0.0030	-
	12-Jun-2019	<0.0030	<0.00060	0.0023	0.024	<0.0010	-	0.53	<0.000020	-	<0.0010	<0.00030	<0.00020	*<0.060*	<0.00020	0.49	**0.088**	<0.0000020	0.0017	<0.00050	<0.10	-	<0.00020	4.5	<0.00010	1	540	-	<0.00020	-	<0.0010	<0.0010	-	0.00025	<0.0010	<0.0030	-
	4-Jun-2020	0.0036	<0.00060	0.0021	0.036	<0.001	-	0.48	<0.000020	-	<0.0010	<0.00030	0.00032	0.29	<0.00020	0.52	**0.16**	<0.0000019	0.0012	0.00068	<0.1	-	<0.00020	4.8	<0.00010	1.2	880	-	<0.0002	-	<0.001	<0.001	-	0.00022	<0.001	<0.003	-
	4-Jun-2021	<0.0050	<0.00050	0.00261	0.0206	<0.00050	<0.00025	0.498	<0.000025	<0.000050	<0.00050	<0.00050	<0.0010	<0.050	<0.00025	0.57	**0.0887**	<0.0000050	0.00172	<0.0025	<0.25	0.0072	<0.00025	5.04	<0.000050	1.2	973	<0.0010	<0.000050	<0.00050	<0.00050	<0.0015	<0.00050	0.000431	<0.0025	<0.0050	
	10-Jun-2022	0.0056	<0.00050	0.00361	0.0156	<0.00010	<0.00025	0.471	<0.000025	<0.000050	<0.0025	<0.00050	<0.0010	<0.15	<0.00025	0.51	0.0302	-	0.00178	<0.0025	<0.25	0.0065	<0.00025	4.86	<0.000050	1.0	898	<0.0010	<0.000050	<0.00050	<0.00050	<0.0015	0.00074	0.000396	<0.0025	<0.0050	<0.0015
	15-Jun-2023	<0.0100	<0.00100	0.00289	0.0216	<0.000200	<0.000500	0.522	<0.0000500	<0.000100	<0.00100	<0.00100	<0.00200	<0.100	<0.000500	0.553	0.0365	<0.0000050	0.00214	<0.00500	<0.500	0.00758	<0.000500	4.7	<0.000100	1.17	867	<0.00200	<0.000100	<0.00100	<0.00100	<0.00300	<0.00100	0.000256	<0.00500	<0.0100	<0.00200
MW20B	30-May-2014	-	<0.00060	-	0.022	-	-	-	<0.000025	-	0.0036	-	0.002	0.24	0.00036	-	-	<0.0000050	-	0.0023	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0045	-
	28-May-2015	0.0035	<0.00060	0.00032	0.014	-	-	0.33	<0.000020	-	0.0029	-	0.0013	<0.060	<0.00020	-	<0.0040	<0.0000050	-	0.0011	-	-	**0.0031**	-	<0.00010	-	-	-	-	-	-	-	-	0.0033	-	<0.0030	-
	8-Jun-2016	<0.0030	<0.00060	0.00030	<0.10	-	-	0.38	<0.000020	-	0.0035	-	0.00053	*<0.60*	<0.00020	-	<0.040	0.0000026	-	0.0016	-	-	<0.00020	-	<0.00010	-	-	-	-	-	-	-	-	0.0013	-	<0.0030	-
	7-Jun-2017	0.0041	<0.00060	0.00032	<0.10	-	-	0.35	<0.000020	-	0.0011	-	0.00059	*<0.60*	<0.00020	-	<0.040	<0.0000020	-	0.00067	-	-	**0.013**	-	<0.00010	-	-	-	-	-	-	-	-	0.0050	-	<0.0030	-
	26-Jun-2018	<0.003	<0.00060	0.00027	0.016	-	-	0.34	<0.000020	-	0.0016	-	0.00073	<0.06	<0.00020	-	<0.004	<0.0000020	-	0.0015	-	-	0.00073	-	<0.00010	-	-	-	-	-	-	-	-	0.0034	-	<0.0030	-
	12-Jun-2019	0.013	<0.00060	0.0003	0.015	<0.0010	-	0.38	<0.000020	-	0.002	<0.00030	0.00093	<0.060	<0.00020	0.47	<0.0040	<0.0000020	0.00071	0.001	<0.10	-	<0.00020	4.4	<0.00010	1.5	660	-	<0.00020	-	<0.0010	<0.0010	-	0.0017	<0.0010	<0.0030	-
	4-Jun-2020	<0.0030	<0.00060	0.00030	0.014	<0.001	-	0.26	<0.000020	-	0.0012	<0.00030	0.004	0.1	<0.00020	0.55	<0.0040	<0.0000019	0.00068	0.0010	<0.1	-	**0.03**	4.6	<0.00010	2.7	900	-	<0.0002	-	<0.001	<0.001	-	**0.011**	<0.001	<0.0030	-
	3-Jun-2021	<0.0050	<0.00050	0.00081	0.0181	<0.00050	<0.00025	0.289	<0.000025	0.000068	0.0015	<0.00050	0.0027	<0.050	<0.00025	0.93	<0.00050	<0.0000050	0.00069	<0.0025	<0.25	0.0137	**0.0973**	7.45	<0.000050	4.85	1530	<0.0010	<0.000050	<0.00050	<0.00050	<0.0015	<0.00050	**0.0596**	<0.0025	0.0225	
	10-Jun-2022	0.0556	<0.00050	0.00084	0.0151	<0.00010	<0.00025	0.216	<0.000025	0.000079	<0.0025	<0.00050	0.00286	<0.15	<0.00025	0.723	<0.025	-	0.000662	<0.0025	<0.25	0.0121	**0.0932**	7	<0.000050	4.31	1250	<0.0010	<0.000050	<0.00050	<0.00050	0.00226	<0.00050	**0.0704**	<0.0025	<0.0050	<0.0015
	15-Jun-2023	<0.0100	<0.00100	<0.00100	0.0146	<0.000200	<0.000500	0.285	<0.0000500	<0.000100	0.00188	<0.00100	0.00207	<0.100	<0.000500	0.802	<0.00100	<0.0000050	0.000914	<0.00500	<0.500	0.0157	**0.0682**	6.1	<0.000100	4.85	1,330	<0.00200	<0.000100	<0.00100	<0.00100	<0.00300	<0.00100	**0.0533**	<0.00500	<0.0100	<0.00200
MW21B	30-May-2014	-	<0.00060	-	<0.010	-	-	-	0.000042	-	<0.0010	-	0.0014	0.071	<0.00020	-	-	<0.0000050	-	0.0015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0030	-
	28-May-2015	0.0042	<0.00060	0.00053	<0.010	-	-	0.22	<0.000020	-	<0.0010	-	0.0008	<0.060	<0.00020	-	<0.004	<0.0000050	-	0.0013	-	-	<0.00020	-	<0.00010	-	-	-	-	-	-	-	-	0.0016	-	<0.0030	-
	8-Jun-2016	<0.0030	<0.00060	0.00064	<0.010	-	-	0.25	<0.000020	-	<0.0010	-	0.00066	<0.060	<0.00020	-	<0.0040	<0.0000020	-	0.0013	-	-	<0.00020	-	<0.00010	-	-	-	-	-	-	-	-	0.0017	-	<0.0030	-
	7-Jun-2017	0.0035	<0.00060	0.00064	<0.010	-	-	0.23	<0.000020	-	<0.0010	-	0.00033	<0.060	0.00034	-	0.0041	<0.0000020	-	0.00086	-	-	<0.00020	-	<0.00010	-	-	-	-	-	-	-	-	0.0017	-	<0.0030	-
	26-Jun-2018	<0.003	<0.00060	0.00066	<0.01	-	-	0.23	<0.000020	-	<0.0010	-	0.00072	<0.06	<0.00020	-	<0.004	<0.0000020	-	0.0012	-	-	<0.0002	-	<0.00010	-	-	-	-	-	-	-	-	0.0019	-	<0.0030	-
	17-Jun-2019	0.028	<0.00060	0.00057	<0.010	<0.0010	-	0.22	<0.000020	-	<0.0010	<0.00030	0.0015	0.084	<0.00020	0.25	0.0079	<0.0000020	0.0014	0.0022	<0.10	-	<0.00020	4	<0.00010	0.33	220	-	<0.00020	-	<0.0010	<0.0010	-	0.0019	<0.0010	<0.0030	-
	5-Jun-2020	0.003	<0.00060	0.00048	<0.010	<0.001	-	0.23	<0.000020	-	<0.0010	<0.00030	0.00095	<0.060	<0.00020	0.28	<0.0040	<0.0000019	0.0012	0.0022	<0.1	-	<0.00020	3.8	<0.00010	0.34	260	-	<0.0002	-	<0.001	0.0026	-	0.0019	<0.001	<0.0030	-
	3-Jun-2021	0.0051	<0.00050	0.00081	0.0107	<0.00050	<0.00025	0.267	<0.000025	<0.000050	<0.00050	<0.00050	<0.0010	<0.050	<0.00025	0.336	0.00162	<0.0000050	0.00135	<0.0025	<0.25	0.007	<0.00025	4.8	<0.000050	0.407	331	<0.0010	<0.000050	<0.00050	<0.00050	<0.0015	<0.00050	0.00213	<0.0025	0.0248	
	10-Jun-2022	0.0134	<0.00020	0.00086	0.00878	<0.000040	<0.00010	0.209	0.0000165	0.000042	<0.0010	<0.00020	0.00073	<0.060	<0.00010	0.255	<0.010	-	0.000971	0.00128	<0.10	0.00623	0.000131	4.2	<0.000020	0.353	276	<0.00040	<0.000020	<0.00020	<0.00020	<0.00060	<0.00020	0.00191	<0.0010	<0.0020	<0.00060
	15-Jun-2023	<0.0050	<0.00050	0.00081	0.00899	<0.000100	<0.000250	0.344	<0.0000250	<0.000050	<0.00050	<0.00050	<0.00100	<0.050	<0.000250	0.307	0.00243	<0.0000050	0.000992	<0.00250	<0.250	0.00747	<0.000250	4.18	<0.000050	0.422	314	<0.00100	<0.000050	<0.00050	<0.00050	<0.00150	<0.00050	0.00216	<0.00250	<0.0050	<0.00100
MW22B	30-May-2014	-	<0.0060	-	<0.010	-	-	-	0.00018	-	<0.010	-	<0.0020	0.075	<0.0020	-	-	<0.0000050	-	<0.0050	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.030	-
	28-May-2015	<0.030	<0.0060	<0.0020	<0.10	-	-	0.25	<0.00020	-	<0.010	-	<0.0020	*<0.60*	<0.0020	-	<0.040	<0.0000050	-	<0.0050	-	-	<0.0020	-	*<0.0010*	-	-	-	-	-	-	-	-	0.0073	-	<0.030	-
	8-Jun-2016	<0.0030	<0.00060	0.00035	<0.10	-	-	0.25	<0.000020	-	0.0015	-	0.0012	*<0.60*	<0.00020	-	<0.040	<0.0000020	-	0.0020	-	-	0.00036	-	<0.00010	-	-	-	-	-	-	-	-	0.0079	-	<0.0030	-
	7-Jun-2017	0.0037	<0.00060	0.00027	<0.10	-	-	0.25	<0.000020	-	<0.0010	-	0.00037	*<0.60*	<0.00020	-	<0.040	<0.0000020	-	0.0013	-	-	0.00028	-	<0.00010	-	-	-	-	-	-	-	-	0.0079	-	<0.0030	-
	26-Jun-2018	<0.003	<0.00060	0.00024	<0.10	-	-	0.24	0.000021	-	<0.0010	-	0.00072	*<0.60*	<0.00020	-	<0.04	<0.0000020	-	0.0016	-	-	0.00037	-	<0.00010	-	-	-	-	-	-	-	-	0.0072	-	<0.0030	-
	17-Jun-2019	**0.074**	<0.00060	0.00050	<0.10	<0.0010	-	0.25	<0.000020	-	0.0011	<0.00030	0.0021	*<0.60*	0.00024	0.73	<0.040	<0.0000020	0.00084	0.0041	<1.0	-	0.00035	4.9	<0.00010	2.7	1200	-	<0.00020	-	<0.0010	0.0014	-	0.0071	<0.0010	0.0032	-
	5-Jun-2020	<0.0030	<0.00060	0.00025	<0.01	<0.001	-	0.21	<0.000020	-	0.0012	<0.00030	0.0017	<0.060	<0.00020	0.71	<0.0040	<0.0000019	0.00078	0.0026	<0.1	-	0.00056	4.8	<0.00010	2.2	1300	-	<0.0002	-	<0.001	<0.001	-	0.0099	<0.001	<0.0030	-
	3-Jun-2021	<0.010	<0.0010	<0.0010	0.0062	<0.0010	<0.00050	0.26	<0.00005	<0.00010	<0.0010	<0.0010	<0.0020	<0.10	<0.00050	0.711	<0.0010	<0.0000050	0.00087	<0.0050	<0.50	0.012	<0.00050	5.04	<0.00010	2.31	1320	<0.0020	<0.00010	<0.0010	<0.0010	<0.0030	<0.0010	0.00764	<0.0050	0.021	
	10-Jun-2022	0.0085	<0.00050	<0.00050	0.00649	<0.00010	<0.00025	0.243	<0.000025	0.000082	<0.0025	<0.00050	0.00153	<0.15	<0.00025	0.763	<0.025	-	0.000585	0.00256	<0.25	0.0126	0.000437	5.15	<0.000050	2.31	1330	<0.0010	<0.000050	<0.00050	<0.00050	<0.0015	<0.00050	0.00984	<0.0025	<0.0050	<0.0015
	16-Jun-2023	<0.0100	<0.00100	<0.00100	0.00641	<0.000200	<0.000500	0.325	0.0000633	0.000111	0.00114	<0.00100	<0.00200	<0.100	<0.000500	0.758	0.00131	<0.0000050	0.000817	<0.00500	<0.500	0.0136	0.000652	5.07	<0.000100	2.65	1,380	<0.00200	<0.000100	<0.00100	<0.00100	<0.00300	<0.00100	0.00952	<0.00500	<0.0100	<0.00200

Notes:

[1] Alberta Environment and Parks (AEP). 2022. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. ISBN 978-1-4601-5501-1. Referenced guidelines are for fine textured soils under Agricultural land use

[2] Alberta Environment and Parks (AEP). Environmental Quality Guidelines for Alberta Surface Waters. March 2018. Table 1 Surface water quality guidelines for the protection of freshwater aquatic life (PAL). Most conservative values applied (chronic or acute).

[3] Guideline varies with hardness.

[4] Guideline varies with pH and temperature.

[5] Guideline varies with chloride.

[6] Guideline varies with pH.

"-" No applicable guideline or not analyzed.

BOLD - Greater than Tier 1 Guideline.

Italic - Detection limit greater than Tier 1 guideline.

Table 4a: Field and Groundwater Analytical Results Summary - Surficial Material Wells

Parameter Group		Dissolved Metals																																			
Parameter		Aluminum	Antimony	Arsenic	Barium	Beryllium	Bismuth	Boron	Cadmium	Cesium	Chromium	Cobalt	Copper	Iron	Lead	Lithium	Manganese	Mercury	Molybdenum	Nickel	Phosphorus	Rubidium	Selenium	Silicon	Silver	Strontium	Sulphur	Tellurium	Thallium	Thorium	Tin	Titanium	Tungsten	Uranium	Vanadium	Zinc	Zirconium
Unit		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		0.0007-0.05	0.006	0.005	1	-	-	1.0	0.00004-0.00037	-	0.05	-	0.007	0.3	0.001-0.007	-	0.05	0.000005	-	0.007-0.17	-	-	0.002	-	0.0001	-	-	-	-	-	-	-	-	0.01	-	0.03	-
Monitoring Well	Date																																				
MW29B	28-May-2015	0.0041	0.0017	**0.0077**	<0.10	-	-	<0.20	0.00017	-	<0.0010	-	0.0019	*<0.60*	<0.00020	-	**0.77**	<0.0000050	-	0.048	-	-	0.001	-	<0.00010	-	-	-	-	-	-	-	-	**0.019**	-	0.014	-
	8-Jun-2016	0.022	<0.00060	0.00054	0.019	-	-	0.20	0.000082	-	0.0014	-	0.0019	**0.54**	<0.00020	-	**0.85**	0.0000043	-	0.0099	-	-	<0.00020	-	<0.00010	-	-	-	-	-	-	-	-	0.0042	-	0.0051	-
	7-Jun-2017	0.01	<0.00060	0.00031	<0.10	-	-	0.21	0.00006	-	<0.0010	-	0.00098	*<0.60*	<0.00020	-	**0.88**	<0.0000020	-	0.0075	-	-	<0.00020	-	<0.00010	-	-	-	-	-	-	-	-	0.0061	-	<0.0030	-
	26-Jun-2018	0.0049	<0.00060	0.00035	<0.1	-	-	<0.2	0.000057	-	<0.0010	-	0.0009	*<0.6*	<0.00020	-	**0.96**	0.0000036	-	0.0075	-	-	0.0002	-	<0.00010	-	-	-	-	-	-	-	-	0.0049	-	<0.0030	-
	17-Jun-2019	<0.0030	<0.00060	<0.00020	<0.10	<0.0010	-	0.2	0.000058	-	<0.0010	0.0032	0.0014	*<0.60*	<0.00020	0.61	**0.80**	<0.0000020	0.0003	0.0055	<1.0	-	<0.00020	5.2	<0.00010	8.6	1700	-	<0.00020	-	<0.0010	<0.0010	-	0.0042	<0.0010	<0.0030	-
	4-Jun-2020	<0.0030	<0.00060	0.00037	0.01	<0.001	-	0.19	0.000046	-	<0.0010	0.003	0.00055	<0.060	<0.00020	0.65	**0.81**	<0.0000019	0.00030	0.0053	<0.1	-	<0.00020	5.4	<0.00010	8.4	1900	-	<0.0002	-	<0.001	<0.001	-	0.005	<0.001	<0.0030	-
	2-Jun-2021	0.011	<0.0010	<0.0010	0.0116	<0.0010	<0.00050	0.22	<0.000050	<0.00010	<0.0010	0.0026	<0.0020	<0.10	<0.00050	0.696	**0.69**	<0.000005	<0.00050	0.0077	<0.50	0.0163	<0.00050	5.43	<0.00010	7.84	1950	<0.0020	<0.00010	<0.0010	<0.0010	<0.0030	<0.0010	0.00634	<0.0050	0.018	<0.0020
	10-Jun-2022	<0.0050	<0.00050	<0.00050	0.012	<0.00010	<0.00025	0.22	0.0000402	0.000063	<0.0025	0.00324	0.00122	<0.15	<0.00025	0.679	**0.73**	-	0.00035	0.00598	<0.25	0.0177	<0.00025	5.7	<0.000050	7.74	1930	<0.0010	<0.000050	<0.00050	<0.00050	<0.0015	<0.00050	0.00542	<0.0025	<0.0050	<0.0015
	16-Jun-2023	0.01	<0.00100	<0.00100	0.0104	<0.000200	<0.000500	0.247	<0.0000500	<0.000100	<0.00100	0.00236	<0.00200	0.11	<0.000500	0.699	**0.627**	<0.0000050	<0.000500	0.00618	<0.500	0.0181	<0.000500	5.64	<0.000100	8.82	1,930	<0.00200	<0.000100	<0.00100	<0.00100	<0.00300	<0.00100	0.00584	<0.00500	<0.0100	<0.00200
MW30B	28-May-2015	<0.030	<0.0060	0.0024	0.022	-	-	0.11	*<0.00020*	-	<0.010	-	0.0035	<0.060	<0.0020	-	**0.068**	<0.0000050	-	0.0053	-	-	<0.0020	-	*<0.0010*	-	-	-	-	-	-	-	-	0.0053	-	<0.030	-
	8-Jun-2016	0.011	<0.00060	0.0010	0.022	-	-	0.14	<0.000020	-	0.0012	-	0.0024	<0.060	<0.00020	-	<0.0040	<0.0000020	-	0.0023	-	-	0.00024	-	<0.00010	-	-	-	-	-	-	-	-	0.0032	-	0.0064	-
	7-Jun-2017	0.0039	<0.00060	0.00068	0.024	-	-	0.12	<0.000020	-	<0.0010	-	0.00083	<0.060	<0.00020	-	<0.004	<0.0000020	-	0.001	-	-	0.00046	-	<0.00010	-	-	-	-	-	-	-	-	0.0038	-	<0.0030	-
	26-Jun-2018	<0.003	<0.00060	0.00068	0.019	-	-	0.12	<0.000020	-	<0.0010	-	0.00091	<0.06	<0.00020	-	<0.004	0.0000033	-	0.00098	-	-	0.0006	-	<0.00010	-	-	-	-	-	-	-	-	0.0024	-	<0.0030	-
	17-Jun-2019	**0.18**	<0.00060	0.00084	0.021	<0.0010	-	0.12	<0.000020	-	<0.0010	<0.00030	0.0014	0.13	<0.00020	0.22	0.0057	<0.0000020	0.00087	0.0029	<0.10	-	0.00058	5.1	<0.00010	0.32	230	-	<0.00020	-	<0.0010	0.0034	-	0.003	<0.0010	<0.0030	-
	29-May-2020	0.025	<0.00060	0.00096	0.018	<0.001	-	0.11	<0.000020	-	<0.0010	<0.00030	0.00084	<0.30	<0.00020	0.21	<0.0040	<0.0000019	0.00094	0.00071	<0.1	-	0.00062	4.6	<0.00010	0.31	230	-	<0.0002	-	<0.001	0.0017	-	0.0040	<0.001	<0.0030	-
	2-Jun-2021	0.0032	0.00011	0.00075	0.0209	<0.00010	<0.000050	0.078	0.0000054	<0.000010	0.00014	<0.00010	0.00166	<0.010	<0.000050	0.226	0.00015	<0.000005	0.000643	0.00078	<0.050	0.00303	0.00107	5.11	<0.000010	0.306	274	<0.00020	<0.000010	<0.00010	0.00011	<0.00030	<0.00010	0.0043	<0.00050	0.0195	0.00022
	10-Jun-2022	0.0341	<0.00020	0.00077	0.0177	<0.000040	<0.00010	0.133	<0.000010	<0.000020	<0.0010	<0.00020	0.00137	<0.060	<0.00010	0.232	<0.010	-	0.000761	0.00185	<0.10	0.00303	0.0016	5.33	<0.000020	0.305	241	<0.00040	<0.000020	<0.00020	<0.00020	0.00084	<0.00020	0.00449	<0.0010	<0.0020	<0.00060
	15-Jun-2023	0.0093	<0.00050	0.00068	0.0174	<0.000100	<0.000250	0.136	<0.0000250	<0.000050	<0.00050	<0.00050	0.00144	<0.050	<0.000250	0.247	0.00051	<0.0000050	0.00115	<0.00250	<0.250	0.00351	0.00112	5.07	<0.000050	0.358	253	<0.00100	<0.000050	<0.00050	<0.00050	<0.00150	<0.00050	0.00488	<0.00250	<0.0050	<0.00100
MW31B	28-May-2015	**0.70**	0.00095	**0.0094**	0.024	-		0.16	<0.000020		<0.0010	-	0.0022	**0.75**	0.00048	-	**0.061**	<0.0000050	-	0.0086	-		0.00064	-	<0.00010	-	-		-		-	-		0.0034	-	<0.0030	
	8-Jun-2016	**0.084**	<0.00060	0.0017	0.023	-	-	0.20	<0.000020	-	<0.0010	-	0.0022	0.26	<0.00020	-	0.041	0.0000027	-	0.0033	-	-	<0.00020	-	<0.00010	-	-	-	-	-	-	-	-	0.00099	-	0.0078	-
	7-Jun-2017	0.011	<0.00060	0.0011	0.022	-	-	0.17	<0.000020	-	<0.0010	-	0.00027	<0.060	<0.00020	-	0.017	<0.0000020	-	0.00081	-	-	<0.00020	-	<0.00010	-	-	-	-	-	-	-	-	0.0012	-	<0.0030	-
	26-Jun-2018	0.0038	<0.00060	0.0011	0.018	-	-	0.18	<0.000020	-	<0.0010	-	0.00064	<0.06	<0.00020	-	0.01	0.0000035	-	0.0008	-	-	<0.0002	-	<0.00010	-	-	-	-	-	-	-	-	0.0008	-	<0.0030	-
	17-Jun-2019	**0.12**	<0.00060	0.0011	0.019	<0.0010	-	0.17	<0.000020	-	<0.0010	<0.00030	0.0017	0.22	<0.00020	0.15	0.015	<0.0000020	0.0014	0.0011	<0.10	-	<0.00020	3.9	<0.00010	0.27	280	-	<0.00020	-	<0.0010	0.0025	-	0.00098	<0.0010	<0.0030	-
	5-Jun-2020	0.0032	<0.00060	0.00099	0.018	<0.001	-	0.18	<0.000020	-	<0.0010	<0.00030	0.00082	<0.060	<0.00020	0.17	<0.0040	<0.0000019	0.0011	0.00067	<0.1	-	<0.00020	3.6	<0.00010	0.27	320	-	<0.0002	-	<0.001	<0.001	-	0.0011	<0.001	<0.0030	-
	3-Jun-2021	<0.0050	<0.00050	0.0012	0.0179	<0.00050	<0.00025	0.218	<0.000025	<0.000050	<0.00050	<0.00050	0.0016	<0.050	<0.00025	0.168	0.0028	<0.0000050	0.00103	<0.0025	<0.25	0.0023	<0.00025	3.82	<0.000050	0.283	338	<0.0010	<0.000050	<0.00050	<0.00050	<0.0015	<0.00050	0.000809	<0.0025	0.02	<0.0010
	10-Jun-2022	0.0438	<0.00020	0.0013	0.0178	<0.000040	<0.00010	0.198	<0.000010	<0.000020	<0.0010	0.0002	0.00114	<0.060	<0.00010	0.179	<0.010	-	0.00111	0.00162	<0.10	0.00267	0.000127	3.89	<0.000020	0.301	322	<0.00040	<0.000020	<0.00020	<0.00020	0.00061	<0.00020	0.00121	<0.0010	<0.0020	<0.00060
	16-Jun-2023	0.01	<0.00100	<0.00100	0.0104	<0.000200	<0.000500	0.247	<0.0000500	<0.000100	<0.00100	0.00236	<0.00200	0.11	<0.000500	0.699	**0.627**	<0.0000050	<0.000500	0.00618	<0.500	0.0181	<0.000500	5.64	<0.000100	8.82	1,930	<0.00200	<0.000100	<0.00100	<0.00100	<0.00300	<0.00100	0.00584	<0.00500	<0.0100	<0.00200
MW32B	28-May-2015	0.0045	0.0016	**0.012**	<0.10	-	-	0.40	0.00011	-	<0.0010	-	0.0012	*<0.60*	<0.00020	-	**0.68**	<0.0000050	-	0.031	-	-	0.00079	-	<0.00010	-	-	-	-	-	-	-	-	0.0027	-	0.0055	-
	8-Jun-2016	0.0038	<0.00060	0.0016	<0.10	-	-	0.48	**0.00046**	-	<0.0010	-	0.0036	*<0.60*	<0.00020	-	**0.85**	<0.0000020	-	0.013	-	-	0.00046	-	<0.00010	-	-	-	-	-	-	-	-	0.00085	-	0.0040	-
	7-Jun-2017	0.016	<0.00060	0.00085	<0.10	-	-	0.46	0.000083	-	<0.0010	-	0.0022	*<0.60*	<0.00020	-	**0.67**	<0.0000020	-	0.0066	-	-	<0.00020	-	<0.00010	-	-	-	-	-	-	-	-	0.00084	-	<0.0030	-
	26-Jun-2018	**0.27**	<0.00060	0.0011	<0.10	-	-	0.48	0.00014	-	<0.0010	-	0.001	*<0.6*	<0.00020	-	**0.57**	0.0000037	-	0.0089	-	-	0.00028	-	<0.00010	-	-	-	-	-	-	-	-	0.0006	-	<0.0030	-
	12-Jun-2019	<0.0030	<0.00060	0.00081	<1.0	<0.0010	-	0.46	0.000028	-	<0.0010	0.0018	0.00023	*<0.60*	<0.00020	<2.0	**0.52**	<0.0000020	0.001	0.0037	<10	-	0.00063	<10	<0.00010	4.6	2100	-	<0.00020	-	<0.0010	<0.0010	-	0.00045	<0.0010	<0.0030	-
	29-May-2020	<0.0030	<0.00060	0.00068	0.014	<0.001	-	0.39	<0.000020	-	<0.0010	0.0023	0.00029	0.22	<0.00020	0.47	**0.6**	<0.0000019	0.0008	0.005	<0.1	-	<0.00020	4.1	<0.00010	5.1	2200	-	<0.0002	-	<0.001	<0.001	-	0.00049	<0.001	<0.0030	-
	4-Jun-2021	0.0082	<0.00050	0.00069	0.0147	<0.00050	<0.00025	0.429	0.000034	0.000063	<0.00050	0.00282	0.0025	<0.050	<0.00025	0.554	**0.679**	<0.0000050	0.0008	0.0052	<0.25	0.0134	<0.00025	4.62	<0.000050	5.28	2600	<0.0010	<0.000050	<0.00050	<0.00050	<0.0015	<0.00050	0.000499	<0.0025	0.0212	0.002
	10-Jun-2022	<0.010	<0.0010	<0.0010	0.0144	<0.00020	<0.00050	0.5	<0.000050	<0.00010	<0.0050	0.0022	0.00279	<0.30	<0.00050	0.542	**0.557**	-	0.0009	<0.0050	<0.50	0.0124	<0.00050	4.69	<0.00010	4.56	2170	<0.0020	<0.00010	<0.0010	<0.0010	<0.0030	<0.0010	0.000576	<0.0050	<0.010	<0.0030
	16-Jun-2023	<0.0200	<0.00200	<0.00200	0.0142	<0.000400	<0.00100	0.478	<0.000100	<0.000200	<0.00200	0.0025	<0.00400	<0.200	<0.00100	0.564	**0.697**	<0.0000050	<0.00100	<0.0100	<1.00	0.0155	<0.00100	4.89	<0.000200	5.96	2,430	<0.00400	<0.000200	<0.00200	<0.00200	<0.00600	<0.00200	0.000456	<0.0100	<0.0200	<0.00400
MW33B	28-May-2015	0.0056	0.0013	**0.0065**	0.038	-	-	0.23	<0.000020	-	<0.0010	-	0.00037	<0.060	<0.00020	-	**0.19**	<0.0000050	-	0.015	-	-	0.00064	-	<0.00010	-	-	-	-	-	-	-	-	0.0021	-	<0.0030	-
	8-Jun-2016	**0.060**	<0.00060	0.0013	0.031	-	-	0.28	<0.000020	-	0.0020	-	0.0027	**0.35**	0.00024	-	**0.24**	**0.00023**	-	0.0096	-	-	0.00038	-	<0.00010	-	-	-	-	-	-	-	-	0.00016	-	0.0056	-
	7-Jun-2017	0.0049	<0.00060	0.0014	<0.10	-	-	0.25	0.000044	-	<0.0010	-	0.0028	*<0.6*	<0.00020	-	**0.25**	**0.0000076**	-	0.011	-	-	0.00043	-	<0.00010	-	-	-	-	-	-	-	-	0.00026	-	<0.0030	-
	26-Jun-2018	**0.073**	<0.00060	0.0021	0.025	-	-	0.27	0.00002	-	<0.0010	-	0.0012	<0.06	<0.00020	-	**0.23**	**0.0000053**	-	0.01	-	-	0.00048	-	<0.00010	-	-	-	-	-	-	-	-	0.00014	-	<0.0030	-
	12-Jun-2019	**0.19**	<0.00060	0.0013	0.028	<0.0010	-	0.29	0.00002	-	<0.0010	0.0013	0.00038	**1.6**	0.00039	0.35	**0.22**	<0.0000020	0.00044	0.009	<0.10	-	0.0006	5	<0.00010	2.1	730	-	<0.00020	-	<0.0010	0.0066	-	<0.00010	<0.0010	<0.0030	-
	4-Jun-2020	**0.1**	<0.00060	0.0012	0.022	<0.001	-	0.25	<0.000020	-	<0.0010	0.0014	0.00041	**0.66**	0.00022	0.33	**0.23**	<0.0000019	0.00031	0.0099	<0.1	-	0.00046	4.9	<0.00010	2.2	780	-	<0.0002	-	<0.001	0.0011	-	<0.00010	<0.001	<0.0030	-
	4-Jun-2021	<0.0050	<0.00050	0.00106	0.0218	<0.00050	<0.00025	0.362	<0.000025	<0.000050	<0.00050	0.00129	<0.0010	<0.050	<0.00025	0.363	**0.181**	<0.0000050	0.00164	0.0083	<0.25	0.0079	0.00037	5.1	<0.000050	2.09	768	<0.0010	<0.000050	<0.00050	<0.00050	<0.0015	<0.00050	0.000076	<0.0025	<0.0050	0.0016
	10-Jun-2022	0.25	<0.00050	0.00145	0.0282	<0.00010	<0.00025	0.386	<0.000025	0.00006	<0.0025	0.00186	<0.0010	**0.636**	<0.00025	0.374	**0.233**	-	0.000863	0.0109	<0.25	0.00825	0.00037	6.3	<0.000050	2	732	<0.0010	<0.00005	<0.00050	<0.00050	0.00681	<0.00050	0.000158	<0.0025	<0.0050	0.00176
	15-Jun-2023	<0.0100	<0.00100	0.0011	0.0193	<0.000200	<0.000500	0.377	<0.0000500	<0.000100	<0.00100	0.00151	<0.00200	<0.100	<0.000500	0.336	**0.197**	<0.0000050	0.00077	0.00936	<0.500	0.00765	<0.000500	5.35	<0.000100	1.89	653	<0.00200	<0.000100	<0.00100	<0.00100	<0.00300	<0.00100	<0.000100	<0.00500	<0.0100	<0.00200
19MW37B	15-Nov-2019	<0.0030	<0.00060	0.001	0.027	<0.0010	-	0.11	<0.000020	-	<0.0010	0.0012	0.00021	**0.096**	0.00026	0.13	**0.27**	<0.0000020	0.00054	0.0017	<0.10	-	<0.00020	6	<0.00010	0.84	73	-	<0.00020	-	<0.0010	<0.0010	-	0.0012	<0.0010	<0.0030	-
	4-Jun-2020	<0.0030	<0.00060	0.00051	0.023	<0.001	-	0.12	<0.000020	-	<0.0010	0.001	0.0033	<0.060	<0.00020	0.15	**0.26**	<0.0000019	0.00046	0.0012	<0.1	-	<0.00020	5.2	<0.00010	0.75	82	-	<0.0002	-	<0.001	<0.001	-	0.0019	<0.001	<0.0030	-
	4-Jun-2021	<0.0010	<0.00010	0.0006	0.0177	<0.00010	<0.000050	0.16	<0.0000050	0.000052	<0.00010	0.00043	0.00052	0.011	<0.000050	0.16	**0.145**	<0.0000050	0.00227	0.00064	<0.050	0.00684	0.000109	5.03	<0.000010	0.627	88.6	<0.00020	<0.000010	0.00018	0.0003	<0.00030	0.00021	0.000285	<0.00050	<0.0010	0.00113
	9-Jun-2022	<0.0010	<0.00010	0.00081	0.0236	<0.000020	<0.000050	0.18	<0.0000050	0.000051	<0.00050	0.0005	0.00106	0.06	<0.000050	0.17	**0.154**	-	0.000179	0.00082	<0.050	0.00758	0.000056	5.44	<0.000010	0.611	91.7	<0.00020	<0.000010	<0.00010	0.00015	<0.00030	<0.00010	0.000154	<0.00050	<0.0010	0.00035
	15-May-2023	<0.0010	<0.00010	0.00052	0.0231	<0.000020	<0.000050	0.154	<0.0000050	0.000057	<0.00050	0.00065	0.00021	<0.010	<0.000050	0.167	**0.227**	<0.0000050	0.00015	0.00073	<0.050	0.0082	<0.000050	5.3	<0.000010	0.804	122	<0.00020	<0.000010	<0.00010	0.00014	<0.00030	<0.00010	0.000219	<0.00050	0.0011	0.00033
23MW38B	21-Dec-2023	<0.0050	<0.00050	0.00204	0.0484	<0.000100	<0.000250	0.431	0.0000306	0.000101	<0.00250	0.00296	<0.00100	<0.050	<0.000250	0.437	**0.453**	<0.0000050	0.00312	0.00532	<0.250	0.0134	0.000511	6.33	<0.000050	2.85	1870	<0.00100	0.000076	<0.00050	<0.00050	<0.00150	<0.00050	0.00989	<0.00250	<0.0050	0.00227

Notes:

[1] Alberta Environment and Parks (AEP). 2022. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. ISBN 978-1-4601-5501-1. Referenced guidelines are for fine textured soils under Agricultural land use

[2] Alberta Environment and Parks (AEP). Environmental Quality Guidelines for Alberta Surface Waters. March 2018. Table 1 Surface water quality guidelines for the protection of freshwater aquatic life (PAL). Most conservative values applied (chronic or acute).

[3] Guideline varies with hardness.

[4] Guideline varies with pH and temperature.

[5] Guideline varies with chloride.

[6] Guideline varies with pH.

"-" No applicable guideline or not analyzed.

BOLD - Greater than Tier 1 Guideline.

Italic - Detection limit greater than Tier 1 guideline.

Table 4a: Field and Groundwater Analytical Results Summary - Surficial Material Wells

Parameter Group: Volatile Organic Compounds (VOCs)

Monitoring Well	Date	Bromobenzene	Bromochloromethane	Bromodichloromethane	Bromoform	Bromomethane	n-Butylbenzene	sec-Butylbenzene	tert-Butylbenzene	Carbon tetrachloride	Chlorobenzene	Chloroethane	Chloroform	Chloromethane	2-Chlorotoluene	4-Chlorotoluene	Dibromochloromethane	1,2-Dibromo-3-chloropropane
Unit		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		-	-	-	-	-	-	-	-	0.002	0.0013	-	0.08	-	-	-	0.1	-
MW10	30-May-2014			-	-	-				-	-	-	-	-			-	
	28-May-2015			-	-	-				-	-	-	-	-			-	
	8-Jun-2016			-	-	-				-	-	-	-	-			-	
	7-Jun-2017			-	-	-				-	-	-	-	-			-	
	26-Jun-2018			-	-	-				-	-	-	-	-			-	
	12-Jun-2019			<0.00050	<0.00050	<0.0020				<0.00050	<0.00050	<0.0010	<0.00050	<0.0020			<0.0010	
	29-May-2020			<0.00050	<0.00050	<0.0020				<0.00050	<0.00050	<0.001	<0.00050	<0.002			<0.0010	
	4-Jun-2021	<0.0010	<0.0010	<0.0010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.0010
	9-Jun-2022	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00020	<0.00050	<0.00050	<0.00050	<0.0020	<0.00050	<0.00050	<0.00050	<0.00050
	15-Jun-2023	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0010
MW18B	30-May-2014			-	-	-				-	-	-	-	-			-	
	28-May-2015			-	-	-				-	-	-	-	-			-	
	8-Jun-2016			-	-	-				-	-	-	-	-			-	
	7-Jun-2017			-	-	-				-	-	-	-	-			-	
	26-Jun-2018			-	-	-				-	-	-	-	-			-	
	12-Jun-2019			<0.00050	<0.00050	<0.0020				<0.00050	<0.00050	<0.0010	<0.00050	<0.0020			<0.0010	
	4-Jun-2020			<0.00050	<0.00050	<0.0020				<0.00050	<0.00050	<0.001	<0.00050	<0.002			<0.0010	
	4-Jun-2021	<0.0010	<0.0010	<0.0010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.0010
	10-Jun-2022	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00020	<0.00050	<0.00050	<0.00050	<0.0020	<0.00050	<0.00050	<0.00050	<0.00050
	15-Jun-2023	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0010
MW19B	30-May-2014			-	-	-				-	-	-	-	-			-	
	28-May-2015			-	-	-				-	-	-	-	-			-	
	8-Jun-2016			-	-	-				-	-	-	-	-			-	
	7-Jun-2017			-	-	-				-	-	-	-	-			-	
	26-Jun-2018			-	-	-				-	-	-	-	-			-	
	12-Jun-2019			<0.00050	<0.00050	<0.0020				<0.00050	<0.00050	<0.0010	<0.00050	<0.0020			<0.0010	
	4-Jun-2020			<0.00050	<0.00050	<0.0020				<0.00050	<0.00050	<0.0010	<0.00050	<0.0020			<0.0010	
	4-Jun-2021	<0.0010	<0.0010	<0.0010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.0010
	10-Jun-2022	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00020	<0.00050	<0.00050	<0.00050	<0.0020	<0.00050	<0.00050	<0.00050	<0.00050
	15-Jun-2023	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0010
MW20B	30-May-2014			-	-	-				-	-	-	-	-			-	
	28-May-2015			-	-	-				-	-	-	-	-			-	
	8-Jun-2016			-	-	-				-	-	-	-	-			-	
	7-Jun-2017			-	-	-				-	-	-	-	-			-	
	26-Jun-2018			-	-	-				-	-	-	-	-			-	
	12-Jun-2019			<0.00050	<0.00050	<0.0020				<0.00050	<0.00050	<0.0010	<0.00050	<0.0020			<0.0010	
	4-Jun-2020			<0.00050	<0.00050	<0.0020				<0.00050	<0.00050	<0.0010	<0.00050	<0.0020			<0.0010	
	3-Jun-2021	<0.0010	<0.0010	<0.0010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.0010
	10-Jun-2022	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00020	<0.00050	<0.00050	<0.00050	<0.0020	<0.00050	<0.00050	<0.00050	<0.00050
	15-Jun-2023	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0010
MW21B	30-May-2014			-	-	-				-	-	-	-	-			-	
	28-May-2015			-	-	-				-	-	-	-	-			-	
	8-Jun-2016			-	-	-				-	-	-	-	-			-	
	7-Jun-2017			-	-	-				-	-	-	-	-			-	
	26-Jun-2018			-	-	-				-	-	-	-	-			-	
	17-Jun-2019			<0.00050	<0.00050	<0.0020				<0.00050	<0.00050	<0.0010	<0.00050	<0.0020			<0.0010	
	5-Jun-2020			<0.00050	<0.00050	<0.0020				<0.00050	<0.00050	<0.0010	<0.00050	<0.0020			<0.0010	
	3-Jun-2021	<0.0010	<0.0010	<0.0010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.0010
	10-Jun-2022	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00020	<0.00050	<0.00050	<0.00050	<0.0020	<0.00050	<0.00050	<0.00050	<0.00050
	15-Jun-2023	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0010
MW22B	30-May-2014			-	-	-				-	-	-	-	-			-	
	28-May-2015			-	-	-				-	-	-	-	-			-	
	8-Jun-2016			-	-	-				-	-	-	-	-			-	
	7-Jun-2017			-	-	-				-	-	-	-	-			-	
	26-Jun-2018			-	-	-				-	-	-	-	-			-	
	17-Jun-2019			<0.00050	<0.00050	<0.0020				<0.00050	<0.00050	<0.0010	<0.00050	<0.0020			<0.0010	
	5-Jun-2020			<0.00050	<0.00050	<0.0020				<0.00050	<0.00050	<0.0010	<0.00050	<0.0020			<0.0010	
	3-Jun-2021	<0.0010	<0.0010	<0.0010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.0010
	10-Jun-2022	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00020	<0.00050	<0.00050	<0.00050	<0.0020	<0.00050	<0.00050	<0.00050	<0.00050
	16-Jun-2023	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0010

Monitoring Well	Date	1,2-Dibromoethane	Dibromomethane	1,2-Dichlorobenzene	1,3-Dichlorobenzene	1,4-Dichlorobenzene	1,1-Dichloroethane	1,2-Dichloroethane	1,1-Dichloroethene	1,2-Dichloroethene (cis)	1,2-Dichloroethene (trans)	Dichlorodifluoromethane	1,2-Dichloropropane	1,3-Dichloropropane	2,2-Dichloropropane	1,1-Dichloropropene	1,3-Dichloropropene [cis]	1,3-Dichloropropene [trans]	Hexachlorobutadiene	p-Isopropyltoluene	Methyl t-Butyl Ether (MTBE)
Unit		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		-	-	0.0007	-	0.001	-	0.005	0.014	-	-	-	-	-	-	-	-	-	-	-	0.015
MW10	30-May-2014	-		-	-	-	-	-	-	-	-		-				-	-	-		-
	28-May-2015	-		-	-	-	-	-	-	-	-		-				-	-	-		-
	8-Jun-2016	-		-	-	-	-	-	-	-	-		-				-	-	-		-
	7-Jun-2017	-		-	-	-	-	-	-	-	-		-				-	-	-		-
	26-Jun-2018	-		-	-	-	-	-	-	-	-		-				-	-	-		-
	12-Jun-2019	<0.00020		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050		<0.00050				<0.00050	<0.00050	-		<0.00050
	29-May-2020	<0.0002		<0.00050	<0.0005	<0.00050	<0.0005	<0.00050	<0.00050	<0.0005	<0.0005		<0.0005				<0.0005	<0.0005	-		<0.00050
	4-Jun-2021	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050
	9-Jun-2022	<0.00020	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	15-Jun-2023	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0015	<0.0010	<0.0010	<0.0010	<0.0010
MW18B	30-May-2014	-		-	-	-	-	-	-	-	-		-				-	-	-		-
	28-May-2015	-		-	-	-	-	-	-	-	-		-				-	-	-		-
	8-Jun-2016	-		-	-	-	-	-	-	-	-		-				-	-	-		-
	7-Jun-2017	-		-	-	-	-	-	-	-	-		-				-	-	-		-
	26-Jun-2018	-		-	-	-	-	-	-	-	-		-				-	-	-		-
	12-Jun-2019	<0.00020		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050		<0.00050				<0.00050	<0.00050	-		<0.00050
	4-Jun-2020	<0.0002		<0.00050	<0.0005	<0.00050	<0.0005	<0.00050	<0.00050	<0.0005	<0.0005		<0.0005				<0.0005	<0.0005	-		<0.00050
	4-Jun-2021	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050
	10-Jun-2022	<0.00020	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	15-Jun-2023	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0015	<0.0010	<0.0010	<0.0010	<0.0010
MW19B	30-May-2014	-		-	-	-	-	-	-	-	-		-				-	-	-		-
	28-May-2015	-		-	-	-	-	-	-	-	-		-				-	-	-		-
	8-Jun-2016	-		-	-	-	-	-	-	-	-		-				-	-	-		-
	7-Jun-2017	-		-	-	-	-	-	-	-	-		-				-	-	-		-
	26-Jun-2018	-		-	-	-	-	-	-	-	-		-				-	-	-		-
	12-Jun-2019	<0.00020		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050		<0.00050				<0.00050	<0.00050	-		<0.00050
	4-Jun-2020	<0.00020		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050		<0.00050				<0.00050	<0.00050	-		<0.00050
	4-Jun-2021	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050
	10-Jun-2022	<0.00020	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	15-Jun-2023	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0015	<0.0010	<0.0010	<0.0010	<0.0010
MW20B	30-May-2014	-		-	-	-	-	-	-	-	-		-				-	-	-		-
	28-May-2015	-		-	-	-	-	-	-	-	-		-				-	-	-		-
	8-Jun-2016	-		-	-	-	-	-	-	-	-		-				-	-	-		-
	7-Jun-2017	-		-	-	-	-	-	-	-	-		-				-	-	-		-
	26-Jun-2018	-		-	-	-	-	-	-	-	-		-				-	-	-		-
	12-Jun-2019	<0.00020		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050		<0.00050				<0.00050	<0.00050	-		<0.00050
	4-Jun-2020	<0.00020		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050		<0.00050				<0.00050	<0.00050	-		<0.00050
	3-Jun-2021	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050
	10-Jun-2022	<0.00020	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	15-Jun-2023	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0015	<0.0010	<0.0010	<0.0010	<0.0010
MW21B	30-May-2014	-		-	-	-	-	-	-	-	-		-				-	-	-		-
	28-May-2015	-		-	-	-	-	-	-	-	-		-				-	-	-		-
	8-Jun-2016	-		-	-	-	-	-	-	-	-		-				-	-	-		-
	7-Jun-2017	-		-	-	-	-	-	-	-	-		-				-	-	-		-
	26-Jun-2018	-		-	-	-	-	-	-	-	-		-				-	-	-		-
	17-Jun-2019	<0.00020		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050		<0.00050				<0.00050	<0.00050	-		<0.00050
	5-Jun-2020	<0.00020		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050		<0.00050				<0.00050	<0.00050	-		<0.00050
	3-Jun-2021	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050
	10-Jun-2022	<0.00020	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	15-Jun-2023	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0015	<0.0010	<0.0010	<0.0010	<0.0010
MW22B	30-May-2014	-		-	-	-	-	-	-	-	-		-				-	-	-		-
	28-May-2015	-		-	-	-	-	-	-	-	-		-				-	-	-		-
	8-Jun-2016	-		-	-	-	-	-	-	-	-		-				-	-	-		-
	7-Jun-2017	-		-	-	-	-	-	-	-	-		-				-	-	-		-
	26-Jun-2018	-		-	-	-	-	-	-	-	-		-				-	-	-		-
	17-Jun-2019	<0.00020		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050		<0.00050				<0.00050	<0.00050	-		<0.00050
	5-Jun-2020	<0.00020		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050		<0.00050				<0.00050	<0.00050	-		<0.00050
	3-Jun-2021	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050
	10-Jun-2022	<0.00020	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	16-Jun-2023	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0015	<0.0010	<0.0010	<0.0010	<0.0010

Monitoring Well	Date	Methylene Chloride	Methyl Methacrylate	iso-Propylbenzene (cumene)	n-Propylbenzene	1,1,1,2-Tetrachloroethane	1,1,2,2-Tetrachloroethane	Tetrachloroethene	1,2,3-Trichlorobenzene	1,2,4-Trichlorobenzene	1,3,5-Trichlorobenzene	1,1,1-Trichloroethane	1,1,2-Trichloroethane	Trichloroethene	Trichlorofluoromethane	Trihalomethanes	1,2,3-Trichloropropane	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	Vinyl chloride
Unit		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		0.05	0.47	-	-	-	-	0.01	0.008	0.015	0.014	-	-	0.005	-	0.1	-	-	-	0.002
MW10	30-May-2014	-	-			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	28-May-2015	-	-			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	8-Jun-2016	-	-			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	7-Jun-2017	-	-			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	26-Jun-2018	<0.0020	-			-	-	<0.00050	-	-	-	-	-	<0.00050	-	-		-	-	<0.00050
	12-Jun-2019	<0.0020	<0.00050			<0.0010	<0.0020	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0013		<0.00050	<0.00050	<0.00050
	29-May-2020	<0.0020	<0.00050			<0.001	<0.002	<0.00050	<0.0010	<0.0010	<0.00050	<0.0005	<0.0005	<0.00050	<0.0005	<0.0013		<0.0005	<0.0005	<0.00050
	4-Jun-2021	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010		<0.0010	<0.0010	<0.0010	<0.0010		<0.0020	<0.0010	<0.0010	<0.0010
	9-Jun-2022	<0.0010	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	-	<0.00050	<0.00050	<0.00050	<0.00050	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	15-Jun-2023	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010	<0.0010
MW18B	30-May-2014	-	-			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	28-May-2015	-	-			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	8-Jun-2016	-	-			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	7-Jun-2017	-	-			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	26-Jun-2018	<0.0020	-			-	-	<0.00050	-	-	-	-	-	<0.00050	-	-		-	-	<0.00050
	12-Jun-2019	<0.0020	<0.00050			<0.0010	<0.0020	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0013		<0.00050	<0.00050	<0.00050
	4-Jun-2020	<0.0020	<0.00050			<0.001	<0.002	<0.00050	<0.0010	<0.0010	<0.00050	<0.0005	<0.0005	<0.00050	<0.0005	<0.0013		<0.0005	<0.0005	<0.00050
	4-Jun-2021	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010		<0.0010	<0.0010	<0.0010	<0.0010		<0.0020	<0.0010	<0.0010	<0.0010
	10-Jun-2022	<0.0010	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	-	<0.00050	<0.00050	<0.00050	<0.00050	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	15-Jun-2023	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010	<0.0010
MW19B	30-May-2014	-	-			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	28-May-2015	-	-			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	8-Jun-2016	-	-			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	7-Jun-2017	-	-			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	26-Jun-2018	<0.0020	-			-	-	<0.00050	-	-	-	-	-	<0.00050	-	-		-	-	<0.00050
	12-Jun-2019	<0.0020	<0.00050			<0.0010	<0.0020	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0013		<0.00050	<0.00050	<0.00050
	4-Jun-2020	<0.0020	<0.00050			<0.0010	<0.0020	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0013		<0.00050	<0.00050	<0.00050
	4-Jun-2021	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010		<0.0010	<0.0010	<0.0010	<0.0010		<0.0020	<0.0010	<0.0010	<0.0010
	10-Jun-2022	<0.0010	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	-	<0.00050	<0.00050	<0.00050	<0.00050	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	15-Jun-2023	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010	<0.0010
MW20B	30-May-2014	-	-			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	28-May-2015	-	-			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	8-Jun-2016	-	-			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	7-Jun-2017	-	-			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	26-Jun-2018	<0.0020	-			-	-	<0.00050	-	-	-	-	-	<0.00050	-	-		-	-	<0.00050
	12-Jun-2019	<0.0020	<0.00050			<0.0010	<0.0020	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0013		<0.00050	<0.00050	<0.00050
	4-Jun-2020	<0.0020	<0.00050			<0.0010	<0.0020	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0013		<0.00050	<0.00050	<0.00050
	3-Jun-2021	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010		<0.0010	<0.0010	<0.0010	<0.0010		<0.0020	<0.0010	<0.0010	<0.0010
	10-Jun-2022	<0.0010	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	-	<0.00050	<0.00050	<0.00050	<0.00050	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	15-Jun-2023	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010	<0.0010
MW21B	30-May-2014	-	-			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	28-May-2015	-	-			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	8-Jun-2016	-	-			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	7-Jun-2017	-	-			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	26-Jun-2018	<0.0020	-			-	-	<0.00050	-	-	-	-	-	<0.00050	-	-		-	-	<0.00050
	17-Jun-2019	<0.0020	<0.00050			<0.0010	<0.0020	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0013		<0.00050	<0.00050	<0.00050
	5-Jun-2020	<0.0020	<0.00050			<0.0010	<0.0020	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0013		<0.00050	<0.00050	<0.00050
	3-Jun-2021	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010		<0.0010	<0.0010	<0.0010	<0.0010		<0.0020	<0.0010	<0.0010	<0.0010
	10-Jun-2022	<0.0010	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	-	<0.00050	<0.00050	<0.00050	<0.00050	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	15-Jun-2023	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010	<0.0010
MW22B	30-May-2014	-	-			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	28-May-2015	-	-			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	8-Jun-2016	-	-			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	7-Jun-2017	-	-			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	26-Jun-2018	<0.0020	-			-	-	<0.00050	-	-	-	-	-	<0.00050	-	-		-	-	<0.00050
	17-Jun-2019	<0.0020	<0.00050			<0.0010	<0.0020	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0013		<0.00050	<0.00050	<0.00050
	5-Jun-2020	<0.0020	<0.00050			<0.0010	<0.0020	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0013		<0.00050	<0.00050	<0.00050
	3-Jun-2021	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010		<0.0010	<0.0010	<0.0010	<0.0010		<0.0020	<0.0010	<0.0010	<0.0010
	10-Jun-2022	<0.0010	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	-	<0.00050	<0.00050	<0.00050	<0.00050	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	16-Jun-2023	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010	<0.0010

Notes:

[1] Alberta Environment and Parks (AEP). 2022. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. ISBN 978-1-4601-5501-1. Referenced guidelines are for fine textured soils under Agricultural land use

[2] Alberta Environment and Parks (AEP). Environmental Quality Guidelines for Alberta Surface Waters. March 2018. Table 1 Surface water quality guidelines for the protection of freshwater aquatic life (PAL). Most conservative values applied (chronic or acute).

[3] Guideline varies with hardness.

[4] Guideline varies with pH and temperature.

[5] Guideline varies with chloride.

[6] Guideline varies with pH.

"-" No applicable guideline or not analyzed.

BOLD - Greater than Tier 1 Guideline.

Italic - Detection limit greater than Tier 1 guideline.

TETRA TECH

Table 4a: Field and Groundwater Analytical Results Summary - Surficial Material Wells

Parameter Group: Volatile Organic Compounds (VOCs)

Monitoring Well	Date	Bromobenzene	Bromochloromethane	Bromodichloromethane	Bromoform	Bromomethane	n-Butylbenzene	sec-Butylbenzene	tert-Butylbenzene	Carbon tetrachloride	Chlorobenzene	Chloroethane	Chloroform	Chloromethane	2-Chlorotoluene	4-Chlorotoluene	Dibromochloromethane	1,2-Dibromo-3-chloropropane	1,2-Dibromoethane	Dibromomethane
Unit		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		-	-	-	-	-	-	-	-	0.002	0.0013	-	0.08	-	-	-	0.1	-	-	-
MW29B	28-May-2015			-	-	-				-	-	-	-	-			-		-	
	8-Jun-2016			-	-	-				-	-	-	-	-			-		-	
	7-Jun-2017			-	-	-				-	-	-	-	-			-		-	
	26-Jun-2018			-	-	-				-	-	-	-	-			-		-	
	17-Jun-2019			<0.00050	<0.00050	<0.0020				<0.00050	<0.00050	<0.0010	<0.00050	<0.0020			<0.0010		<0.00020	
	4-Jun-2020			<0.00050	<0.00050	<0.0020				<0.00050	<0.00050	<0.0010	<0.00050	<0.0020			<0.0010		<0.00020	
	2-Jun-2021	<0.0010	<0.0010	<0.0010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	10-Jun-2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	16-Jun-2023	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
MW30B	28-May-2015			-	-	-				-	-	-	-	-			-		-	
	8-Jun-2016			-	-	-				-	-	-	-	-			-		-	
	7-Jun-2017			-	-	-				-	-	-	-	-			-		-	
	26-Jun-2018			-	-	-				-	-	-	-	-			-		-	
	17-Jun-2019			<0.00050	<0.00050	<0.0020				<0.00050	<0.00050	<0.0010	<0.00050	<0.0020			<0.0010		<0.00020	
	29-May-2020			<0.00050	<0.00050	<0.0020				<0.00050	<0.00050	<0.0010	<0.00050	<0.0020			<0.0010		<0.00020	
	2-Jun-2021	<0.0010	<0.0010	<0.0010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	10-Jun-2022	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00020	<0.00050	<0.00050	<0.00050	<0.0020	<0.00050	<0.00050	<0.00050	<0.00050	<0.00020	<0.00050
	15-Jun-2023	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
MW31B	28-May-2015			-	-	-				-	-	-	-	-			-		-	
	8-Jun-2016			-	-	-				-	-	-	-	-			-		-	
	7-Jun-2017			-	-	-				-	-	-	-	-			-		-	
	26-Jun-2018			-	-	-				-	-	-	-	-			-		-	
	17-Jun-2019			<0.00050	<0.00050	<0.0020				<0.00050	<0.00050	<0.0010	<0.00050	<0.0020			<0.0010		<0.00020	
	5-Jun-2020			<0.00050	<0.00050	<0.0020				<0.00050	<0.00050	<0.0010	<0.00050	<0.0020			<0.0010		<0.00020	
	3-Jun-2021	<0.0010	<0.0010	<0.0010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	10-Jun-2022	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00020	<0.00050	<0.00050	<0.00050	<0.0020	<0.00050	<0.00050	<0.00050	<0.00050	<0.00020	<0.00050
	16-Jun-2023	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
MW32B	28-May-2015			-	-	-				-	-	-	-	-			-		-	
	8-Jun-2016			-	-	-				-	-	-	-	-			-		-	
	7-Jun-2017			-	-	-				-	-	-	-	-			-		-	
	26-Jun-2018			-	-	-				-	-	-	-	-			-		-	
	12-Jun-2019			<0.00050	<0.00050	<0.0020				<0.00050	<0.00050	<0.0010	<0.00050	<0.0020			<0.0010		<0.00020	
	29-May-2020			<0.00050	<0.00050	<0.0020				<0.00050	<0.00050	<0.0010	<0.00050	<0.0020			<0.0010		<0.00020	
	4-Jun-2021	<0.0010	<0.0010	<0.0010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	10-Jun-2022	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00020	<0.00050	<0.00050	<0.00050	<0.0020	<0.00050	<0.00050	<0.00050	<0.00050	<0.00020	<0.00050
	16-Jun-2023	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
MW33B	28-May-2015			-	-	-				-	-	-	-	-			-		-	
	8-Jun-2016			-	-	-				-	-	-	-	-			-		-	
	7-Jun-2017			-	-	-				-	-	-	-	-			-		-	
	26-Jun-2018			-	-	-				-	-	-	-	-			-		-	
	12-Jun-2019			<0.00050	<0.00050	<0.0020				<0.00050	<0.00050	<0.0010	<0.00050	<0.0020			<0.0010		<0.00020	
	4-Jun-2020			<0.00050	<0.00050	<0.0020				<0.00050	<0.00050	<0.0010	<0.00050	<0.0020			<0.0010		<0.00020	
	4-Jun-2021	<0.0010	<0.0010	<0.0010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	10-Jun-2022	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00020	<0.00050	<0.00050	<0.00050	<0.0020	<0.00050	<0.00050	<0.00050	<0.00050	<0.00020	<0.00050
	15-Jun-2023	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
19MW37B	15-Nov-2019			-	-	-				-	-	-	-	-			-		-	
	4-Jun-2020			<0.00050	<0.00050	<0.0020				<0.00050	<0.00050	<0.0010	<0.00050	<0.0020			<0.0010		<0.00020	
	4-Jun-2021	<0.0010	<0.0010	<0.0010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	9-Jun-2022	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00020	<0.00050	<0.00050	<0.00050	<0.0020	<0.00050	<0.00050	<0.00050	<0.00050	<0.00020	<0.00050
	15-May-2023	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
23MW38B	21-Dec-2023	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010

Monitoring Well	Date	1,2-Dichlorobenzene	1,3-Dichlorobenzene	1,4-Dichlorobenzene	1,1-Dichloroethane	1,2-Dichloroethane	1,1-Dichloroethene	1,2-Dichloroethene (cis)	1,2-Dichloroethene (trans)	Dichlorodifluoromethane	1,2-Dichloropropane	1,3-Dichloropropane	2,2-Dichloropropane	1,1-Dichloropropene	1,3-Dichloropropene [cis]	1,3-Dichloropropene [trans]	Hexachlorobutadiene	p-Isopropyltoluene	Methyl t-Butyl Ether (MTBE)	Methylene Chloride	Methyl Methacrylate
Unit		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		0.0007	-	0.001	-	0.005	0.014	-	-	-	-	-	-	-	-	-	-	-	0.015	0.05	0.47
MW29B	28-May-2015	-	-	-	-	-	-	-	-		-				-	-	-		-	-	-
	8-Jun-2016	-	-	-	-	-	-	-	-		-				-	-	-		-	-	-
	7-Jun-2017	-	-	-	-	-	-	-	-		-				-	-	-		-	-	-
	26-Jun-2018	-	-	-	-	-	-	-	-		-				-	-	-		-	<0.0020	-
	17-Jun-2019	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050		<0.00050				<0.00050	<0.00050	-		<0.00050	<0.0020	<0.00050
	4-Jun-2020	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050		<0.00050				<0.00050	<0.00050	-		<0.00050	<0.0020	<0.00050
	2-Jun-2021	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	-
	10-Jun-2022	-	-	-	-	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00020	<0.00050	<0.00050	<0.00050	<0.0020	<0.00050	<0.00050
	16-Jun-2023	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0015	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010
MW30B	28-May-2015	-	-	-	-	-	-	-	-		-				-	-	-		-	-	-
	8-Jun-2016	-	-	-	-	-	-	-	-		-				-	-	-		-	-	-
	7-Jun-2017	-	-	-	-	-	-	-	-		-				-	-	-		-	-	-
	26-Jun-2018	-	-	-	-	-	-	-	-		-				-	-	-		-	<0.0020	-
	17-Jun-2019	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050		<0.00050				<0.00050	<0.00050	-		<0.00050	<0.0020	<0.00050
	29-May-2020	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050		<0.00050				<0.00050	<0.00050	-		<0.00050	<0.0020	<0.00050
	2-Jun-2021	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	-
	10-Jun-2022	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0010	-
	15-Jun-2023	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0015	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010
MW31B	28-May-2015	-	-	-	-	-	-	-	-		-				-	-	-		-	-	-
	8-Jun-2016	-	-	-	-	-	-	-	-		-				-	-	-		-	-	-
	7-Jun-2017	-	-	-	-	-	-	-	-		-				-	-	-		-	-	-
	26-Jun-2018	-	-	-	-	-	-	-	-		-				-	-	-		-	<0.0020	-
	17-Jun-2019	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050		<0.00050				<0.00050	<0.00050	-		<0.00050	<0.0020	<0.00050
	5-Jun-2020	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050		<0.00050				<0.00050	<0.00050	-		<0.00050	<0.0020	<0.00050
	3-Jun-2021	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	-
	10-Jun-2022	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0010	-
	16-Jun-2023	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0015	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010
MW32B	28-May-2015	-	-	-	-	-	-	-	-		-				-	-	-		-	-	-
	8-Jun-2016	-	-	-	-	-	-	-	-		-				-	-	-		-	-	-
	7-Jun-2017	-	-	-	-	-	-	-	-		-				-	-	-		-	-	-
	26-Jun-2018	-	-	-	-	-	-	-	-		-				-	-	-		-	<0.0020	-
	12-Jun-2019	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050		<0.00050				<0.00050	<0.00050	-		<0.00050	<0.0020	<0.00050
	29-May-2020	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050		<0.00050				<0.00050	<0.00050	-		<0.00050	<0.0020	<0.00050
	4-Jun-2021	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	-
	10-Jun-2022	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0010	-
	16-Jun-2023	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0015	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010
MW33B	28-May-2015	-	-	-	-	-	-	-	-		-				-	-	-		-	-	-
	8-Jun-2016	-	-	-	-	-	-	-	-		-				-	-	-		-	-	-
	7-Jun-2017	-	-	-	-	-	-	-	-		-				-	-	-		-	-	-
	26-Jun-2018	-	-	-	-	-	-	-	-		-				-	-	-		-	<0.0020	-
	12-Jun-2019	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050		<0.00050				<0.00050	<0.00050	-		<0.00050	<0.0020	<0.00050
	4-Jun-2020	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050		<0.00050				<0.00050	<0.00050	-		<0.00050	<0.0020	<0.00050
	4-Jun-2021	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	-
	10-Jun-2022	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0010	-
	15-Jun-2023	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0015	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010
19MW37B	15-Nov-2019	-	-	-	-	<0.00050	-	-	-		-				-	-	-		-	-	-
	4-Jun-2020	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050		<0.00050				<0.00050	<0.00050	-		<0.00050	<0.0020	<0.00050
	4-Jun-2021	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	-
	9-Jun-2022	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0010	-
	15-May-2023	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0015	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010
23MW38B	21-Dec-2023	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0015	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010

Monitoring Well	Date	iso-Propylbenzene (cumene)	n-Propylbenzene	1,1,1,2-Tetrachloroethane	1,1,2,2-Tetrachloroethane	Tetrachloroethene	1,2,3-Trichlorobenzene	1,2,4-Trichlorobenzene	1,3,5-Trichlorobenzene	1,1,1-Trichloroethane	1,1,2-Trichloroethane	Trichloroethene	Trichlorofluoromethane	Trihalomethanes	1,2,3-Trichloropropane	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	Vinyl chloride
Unit		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		-	-	-	-	0.01	0.008	0.015	0.014	-	-	0.005	-	0.1	-	-	-	0.002
MW29B	28-May-2015			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	8-Jun-2016			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	7-Jun-2017			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	26-Jun-2018			-	-	<0.00050	-	-	-	-	-	<0.00050	-	-		-	-	<0.00050
	17-Jun-2019			<0.0010	<0.0020	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0013		<0.00050	<0.00050	<0.00050
	4-Jun-2020			<0.0010	<0.0020	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0013		<0.00050	<0.00050	<0.00050
	2-Jun-2021	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0020	<0.0010	<0.0010	<0.0010
	10-Jun-2022	<0.00050	<0.00050	<0.00020	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	16-Jun-2023	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010	<0.0010
MW30B	28-May-2015			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	8-Jun-2016			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	7-Jun-2017			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	26-Jun-2018			-	-	<0.00050	-	-	-	-	-	<0.00050	-	-		-	-	<0.00050
	17-Jun-2019			<0.0010	<0.0020	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0013		<0.00050	<0.00050	<0.00050
	29-May-2020			<0.0010	<0.0020	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0013		<0.00050	<0.00050	<0.00050
	2-Jun-2021	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0020	<0.0010	<0.0010	<0.0010
	10-Jun-2022	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	-	<0.00050	<0.00050	<0.00050	<0.00050	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	15-Jun-2023	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010	<0.0010
MW31B	28-May-2015			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	8-Jun-2016			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	7-Jun-2017			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	26-Jun-2018			-	-	<0.00050	-	-	-	-	-	<0.00050	-	-		-	-	<0.00050
	17-Jun-2019			<0.0010	<0.0020	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0013		<0.00050	<0.00050	<0.00050
	5-Jun-2020			<0.0010	<0.0020	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0013		<0.00050	<0.00050	<0.00050
	3-Jun-2021	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010		<0.0010	<0.0010	<0.0010	<0.0010		<0.0020	<0.0010	<0.0010	<0.0010
	10-Jun-2022	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	-	<0.00050	<0.00050	<0.00050	<0.00050	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	16-Jun-2023	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010	<0.0010
MW32B	28-May-2015			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	8-Jun-2016			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	7-Jun-2017			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	26-Jun-2018			-	-	<0.00050	-	-	-	-	-	<0.00050	-	-		-	-	<0.00050
	12-Jun-2019			<0.0010	<0.0020	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0013		<0.00050	<0.00050	<0.00050
	29-May-2020			<0.0010	<0.0020	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0013		<0.00050	<0.00050	<0.00050
	4-Jun-2021	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010		<0.0010	<0.0010	<0.0010	<0.0010		<0.0020	<0.0010	<0.0010	<0.0010
	10-Jun-2022	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	-	<0.00050	<0.00050	<0.00050	<0.00050	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	16-Jun-2023	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010	<0.0010
MW33B	28-May-2015			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	8-Jun-2016			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	7-Jun-2017			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	26-Jun-2018			-	-	<0.00050	-	-	-	-	-	<0.00050	-	-		-	-	<0.00050
	12-Jun-2019			<0.0010	<0.0020	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0013		<0.00050	<0.00050	<0.00050
	4-Jun-2020			<0.0010	<0.0020	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0013		<0.00050	<0.00050	<0.00050
	4-Jun-2021	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010		<0.0010	<0.0010	<0.0010	<0.0010		<0.0020	<0.0010	<0.0010	<0.0010
	10-Jun-2022	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	-	<0.00050	<0.00050	<0.00050	<0.00050	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	15-Jun-2023	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010	<0.0010
19MW37B	15-Nov-2019			-	-	<0.00050	-	-	-	-	-	<0.00050	-	-		-	-	<0.00050
	4-Jun-2020			<0.0010	<0.0020	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0013		<0.00050	<0.00050	<0.00050
	4-Jun-2021	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010		<0.0010	<0.0010	<0.0010	<0.0010		<0.0020	<0.0010	<0.0010	<0.0010
	9-Jun-2022	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	-	<0.00050	<0.00050	<0.00050	<0.00050	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	15-May-2023	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010	<0.0010
23MW38B	21-Dec-2023	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010	<0.0010

Notes:
[1] Alberta Environment and Parks (AEP). 2022. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. ISBN 978-1-4601-5501-1. Referenced guidelines are for fine textured soils under Agricultural land use
[2] Alberta Environment and Parks (AEP). Environmental Quality Guidelines for Alberta Surface Waters. March 2018. Table 1 Surface water quality guidelines for the protection of freshwater aquatic life (PAL). Most conservative values applied (chronic or acute).
[3] Guideline varies with hardness.
[4] Guideline varies with pH and temperature.
[5] Guideline varies with chloride.
[6] Guideline varies with pH.
"-" No applicable guideline or not analyzed.
BOLD - Greater than Tier 1 Guideline.
Italic - Detection limit greater than Tier 1 guideline.

Table 4b: Field and Groundwater Analytical Results Summary - Upper Sandstone Wells

Parameter Group		Field			Routine																		Nutrients					Hydrocarbons										Organics		
Parameter		pH	Electrical Conductivity	Temperature	pH	Electrical Conductivity	Total Dissolved Solids	Hardness	Alkalinity, total (as CaCO3)	Bicarbonate	Carbonate	Hydroxide	Calcium	Magnesium	Potassium	Sodium	Chloride	Fluoride	Sulphate	Anions Total	Cations Total	Ionic Balance	Ammonia-N	Nitrate (N)	Nitrite (N)	Nitrate and Nitrate (N)	Total Kjeldahl Nitrogen	Benzene	Toluene	Ethylbenzene	Xylenes (m & p)	Xylene (o)	Xylenes	Styrene	F1 (C6-C10)	F1-BTEX	F2 (C10-C16)	Total Phenols	Chemical Oxygen Demand	Dissolved Organic Carbon
Unit		pH Units			pH Units	µS/cm	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	-	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		6.5-8.5	1000	-	6.5-8.5	1000	500	-	-	-	-	-	-	-	-	200	100	1	128-429	-	-	-	0.018-190	3	0.02-0.20	100	-	0.005	0.024	0.0016	-	-	0.02	0.072	2.2	2.2	1.1	-	-	-
Monitoring Well	Date																																							
MW1C	30-May-2014	8.0	**6100**	6.7	8.08	**5900**	**4800**	-	-	770	<0.50	-	130	33	4.8	**1300**	1.1	-	**3000**	-	-	0.57	0.093	-	-	1.2	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	39	9.6
	28-May-2015	8.2	**6420**	6.6	7.98	**6100**	**4800**	490	620	750	<0.50	<0.50	140	34	6.6	**1400**	1.7	-	**2900**	-	-	0.99	0.60	0.080	<0.010	0.080	1.2	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	42	11
	8-Jun-2016	**6.43**	**7540**	8.1	8.18	**6100**	**4700**	510	580	710	<0.50	<0.50	140	36	6.9	**1300**	1.4	-	**2800**	-	-	0.96	0.46	0.22	0.018	0.23	0.58	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	51	11
	7-Jun-2017	7.6	**7270**	9.7	8.23	**6100**	**4600**	530	620	760	<0.5	<0.5	150	38	7.1	**1400**	<1.0	-	**2600**	-	-	3.8	0.7	0.41	**0.28**	-	1.1	<0.00040	<0.00040	<0.00040	-	-	<0.0008	-	-	<0.10	<0.10	-	28	10
	26-Jun-2018	8.0	**6950**	6.1	8.1	**6100**	**4700**	510	620	760	<1.0	<1.0	140	37	6.7	**1400**	<1.0	-	**2700**	-	-	0.72	0.56	0.15	<0.010	0.15	1.1	<0.00040	<0.00040	<0.00040	-	-	<0.00089	<0.0005	-	<0.10	<0.10	<0.002	30	11
	12-Jun-2019	7.6	**5990**	9.9	8.14	**6100**	**4400**	480	620	760	<1.0	<1.0	140	33	6.4	**1300**	1.8	-	**2500**	64	67	2.4	0.63	0.19	**0.027**	0.22	0.94	<0.00040	<0.00040	<0.00040	<0.00080	<0.00040	<0.00089	<0.00050	<0.10	<0.10	<0.10	<0.0015	48	12
	5-Jun-2020	7.24	**5940**	7.0	8.25	**5900**	**4500**	480	570	700	<1.0	<1.0	140	34	6.5	**1400**	2.1	-	**2600**	67	70	2.1	0.39	0.38	**0.042**	0.42	0.91	<0.00040	<0.00040	<0.00040	<0.00080	<0.00040	<0.00089	<0.00050	<0.10	<0.10	<0.10	<0.0015	36	9.9
	4-Jun-2021	7.36	**5590**	7.9	8.25	**5180**	**4480**	411	561	684	<5.0	<5.0	117	28.8	5.81	**1220**	<2.5	0.24	**2770**	-	-	89.2	0.416	0.22	**<0.050**	0.22	1.11	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00071	<0.00050	<0.10	<0.10	<0.10	0.0028	35	12.4
	10-Jun-2022	7.74	**6680**	8.2	8.35	**5470**	**4460**	440	669	800	8.3	<1.0	125	31.1	5.88	**1230**	<2.5	0.227	**2640**	68.4	62.5	91.4	0.603	0.1	**<0.050**	<0.112	1.09	<0.00050	<0.00050	<0.00050	<0.00030	<0.00040	<0.00050	<0.00050	<0.10	<0.10	<0.10	<0.0010	30	12.9
	15-Jun-2023	7.88	**5660**	11.1	8.35	**4570**	**4370**	428	516	613	7.9	<1.0	117	33	6.67	**1340**	<5.00	<0.200	**2540**	-	-	106	0.721	<0.200	<0.100	<0.224	1.09	<0.00050	<0.00050	<0.00050	<0.00040	<0.00030	<0.00050	<0.00050	<0.10	<0.100	<0.10	<0.0010	39	12.1
MW8B	30-May-2014	7.6	**8960**	4.0	8.37	**8500**	**7600**	-	-	1100	18	-	110	62	5.4	**2300**	23	-	**4500**	-	-	-	0.57	0.074	-	-	1.4	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	39	13
	28-May-2015	8.0	**9280**	6.6	7.95	**8700**	**7100**	460	910	1100	<0.50	<0.50	90	56	6.2	**2200**	26	-	**4200**	-	-	1.0	0.69	0.12	<0.010	0.12	1.6	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	48	14
	8-Jun-2016	7.73	**8940**	6.8	8.19	**8700**	**6600**	460	870	1100	<0.50	<0.50	97	54	6.7	**2000**	28	-	**3900**	-	-	0.97	0.62	0.10	<0.050	0.10	1.3	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	47	15
	7-Jun-2017	7.8	**9250**	5.8	8.17	**8800**	**6800**	480	940	1100	<0.50	<0.5	97	57	6.7	**2100**	30	-	**3900**	-	-	0.098	0.38	1.5	<0.16	0.35	1.3	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	44	16
	26-Jun-2018	7.50	**8880**	7.8	8.16	**8400**	**6700**	430	1000	1200	<1.0	<1.0	88	52	6.8	**2100**	38	-	**3800**	-	-	0.79	0.49	0.17	0.03	0.2	1.4	<0.00040	<0.00040	<0.00040	-	-	<0.00089	<0.0005	-	<0.10	<0.10	0.002	44	15
	12-Jun-2019	7.72	**8010**	14	8.14	**8100**	**6000**	380	1000	1200	<1.0	<1.0	86	41	<30	**2000**	43	-	**3200**	89	94	2.8	0.59	0.11	<0.10	<0.14	1.4	<0.00040	<0.00040	<0.00040	<0.00080	<0.00040	<0.00089	<0.00050	<0.10	<0.10	<0.10	0.0025	51	17
	29-May-2020	7.62	**7730**	10.2	8.3	**8000**	**5600**	350	1000	1200	<1.0	<1.0	74	40	5.1	**2000**	62	-	**2800**	80	94	7.0	0.48	0.11	0.034	0.15	1.6	<0.00040	<0.00040	<0.00040	<0.00080	<0.00040	<0.00089	<0.00050	<0.10	<0.10	<0.10	<0.0015	52	17
	4-Jun-2021	7.66	**7250**	14.1	8.41	**6810**	**6060**	338	1090	1300	15.2	<5.0	68.6	40.4	5.55	**1890**	53.4	0.81	**3350**	-	-	95.7	0.403	0.2	<0.050	0.2	1.35	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00071	<0.00050	<0.10	<0.10	<0.10	0.005	63	19.8
	10-Jun-2022	7.6	**2120**	7.3	8.43	**7210**	**5840**	320	1240	1470	20.6	<1.0	65.8	37.8	5.32	**1760**	51.2	0.676	**3140**	91.6	83.1	90.7	0.422	0.164	0.097	0.261	1.39	<0.00050	<0.00050	<0.00050	<0.00030	<0.00040	<0.00050	<0.00050	<0.10	<0.10	<0.10	<0.0010	50	19.9
	15-Jun-2023	7.78	**7020**	15.5	**8.67**	**5.930**	**5.670**	324	1240	1.170	49.7	<1.0	64.1	39.7	6.09	**1.860**	50.9	0.659	**2.990**	-	-	104	0.46	<0.400	<0.200	<0.447	1.4	<0.00050	<0.00050	<0.00050	<0.00040	<0.00030	<0.00050	<0.00050	<0.10	<0.100	<0.10	<0.0010	54	18.3
MW11	30-May-2014	7.5	**10,020**	6.2	8.19	**9500**	**8800**	-	-	840	<0.50	-	240	130	7.6	**2300**	14	-	**5600**	-	-	-	0.14	0.27	-	-	1.7	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	96	29
	28-May-2015	7.8	**10,140**	6.4	7.79	**9500**	**8200**	980	740	900	<0.50	<0.50	210	110	8.4	**2200**	20	-	**5100**	-	-	0.96	0.17	0.19	<0.010	0.19	1.7	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	100	34
	8-Jun-2016	7.61	**9900**	8.6	8.03	**9600**	**7800**	1100	770	930	<0.50	<0.50	230	120	9.1	**2100**	32	-	**4800**	-	-	0.97	0.15	0.23	<0.015	0.25	0.81	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	100	36
	7-Jun-2017	7.7	**9710**	7.4	7.88	**9100**	**7500**	980	850	1000	<0.50	<0.5	200	120	8.0	**2100**	37	-	**4500**	-	-	2.6	0.086	0.71	<0.16	-	1.5	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	84	31
	26-Jun-2018	7.5	**10,350**	7.9	8.01	**9800**	**7800**	1100	830	1000	<1.0	<1.0	240	130	8.7	**2300**	36	-	**4600**	-	-	3.8	0.063	0.33	<0.01	0.33	1.7	<0.00040	<0.00040	<0.00040	-	-	<0.00089	<0.0005	-	<0.10	<0.10	0.0024	98	36
	12-Jun-2019	7.28	**8,860**	9.6	7.99	**8500**	**6500**	860	750	910	<1.0	<1.0	190	92	<30	**2000**	31	-	**3700**	92	110	6.5	0.11	0.26	<0.10	0.26	1.2	<0.00040	<0.00040	<0.00040	<0.00080	<0.00040	<0.00089	<0.00050	<0.10	<0.10	<0.10	<0.0015	86	32
	29-May-2020	7.18	**9260**	9.3	8.05	**9400**	**7000**	1100	780	960	<1.0	<1.0	230	120	8.4	**2300**	53	-	**3800**	96	120	11	0.22	0.074	<0.050	0.075	1.1	<0.00040	<0.00040	<0.00040	<0.00080	<0.00040	<0.00089	<0.00050	<0.10	<0.10	<0.10	<0.0015	91	27
	4-Jun-2021	7.74	**8740**	10.1	8.15	**8320**	**7910**	963	813	992	<5.0	<5.0	201	112	7.65	**2190**	48.3	0.53	**4860**	-	-	96.5	0.237	0.24	<0.050	0.24	1.38	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00071	<0.00050	<0.10	<0.10	<0.10	<0.0010	92	36.1
	9-Jun-2022	7.51	**10450**	12.3	8.2	**8660**	**7550**	913	900	1100	<1.0	<1.0	194	104	7.49	**1930**	54.1	0.48	**4670**	117	102	87.2	<0.0050	0.134	<0.050	0.134	1.48	<0.00050	<0.00050	<0.00050	<0.00030	<0.00040	<0.00050	<0.00050	<0.10	<0.10	<0.10	<0.0010	82	34.6
	15-Jun-2023	7.74	**8520**	12.6	8.29	**6.820**	**9.260**	1.650	685	836	<1.0	<1.0	336	198	15.1	**3.860**	56.3	0.404	**4.320**	-	-	191	0.206	<0.400	<0.200	<0.447	1.53	<0.00050	<0.00050	<0.00050	<0.00040	<0.00030	<0.00050	<0.00050	<0.10	<0.100	<0.10	<0.0010	84	33.1
MW23B	30-May-2014	7.5	**9800**	9.9	8.06	**9600**	**8400**	-	-	1100	<0.50	-	170	64	11	**2400**	2.2	-	**5200**	-	-	-	0.18	0.36	-	-	0.56	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	47	5.8
	28-May-2015	7.8	**9750**	9.8	7.76	**9700**	**7900**	670	860	1000	<0.50	<0.50	170	62	13	**2300**	2.6	-	**4900**	-	-	0.94	0.42	0.072	0.015	0.087	0.76	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	23	7.4
	8-Jun-2016	7.45	**10170**	10.3	7.89	**9900**	**8000**	670	860	1100	<0.50	<0.50	170	63	12	**2400**	1.9	-	**4900**	-	-	0.98	<0.050	0.32	<0.010	0.32	0.46	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	22	5.5
	7-Jun-2017	7.3	**9700**	9.3	8.05	**10,000**	**7900**	690	870	1100	<0.50	<0.5	170	66	12	**2400**	3.7	-	**4700**	-	-	1.3	0.39	0.85	<0.16	-	0.67	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	22	9.5
	26-Jun-2018	7.7	**10,680**	8.0	7.95	**10,000**	**8000**	710	860	1100	<1.0	<1.0	170	68	12	**2400**	3.2	-	**4800**	-	-	1.2	0.33	0.068	<0.01	0.068	0.71	<0.00040	<0.00040	<0.00040	-	-	<0.00089	<0.0005	-	<0.10	<0.10	<0.002	28	6.6
	17-Jun-2019	7.41	**9,970**	9.9	8.09	**10,000**	**7600**	650	860	1100	<1.0	<1.0	160	63	11	**2300**	4.4	-	**4600**	110	110	0.8	0.25	0.21	0.022	0.23	0.63	<0.00040	<0.00040	<0.00040	<0.00080	<0.00040	<0.00089	<0.00050	<0.10	<0.10	<0.10	<0.0015	32	7.7
	5-Jun-2020	7.3	**10020**	8.3	8.04	**9,900**	**8300**	730	830	800	980	<1.0	<1.0	180	67	12	**2500**	4.2	-	**5000**	120	120	0.89	0.38	0.24	0.026	0.26	0.54	<0.00040	<0.00040	<0.00040	<0.00080	<0.00040	<0.00089	<0.00050	<0.10	<0.10	<0.10	<0.0015	75	7.8
	3-Jun-2021	7.3	**9550**	14.9	8.29	**8,410**	**8530**	772	841	1030	<5.0	<5.0	189	72.8	12.4	**2450**	<5.0	<0.20	**5300**	-	-	96.20	0.415	<0.20	<0.10	<0.22	0.6	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00071	<0.00050	<0.10	<0.10	<0.10	<0.0010	20	7.6
	10-Jun-2022	7.39	**11500**	9.9	8.22	**9,290**	**8210**	712	885	1080	<1.0	<1.0	175	66.9	11.5	**2380**	<5.0	<0.20	**5020**	122	118	96.70	0.412	0.298	<0.10	0.298	0.71	<0.00050	<0.00050	<0.00050	<0.00030	<0.00040	<0.00050	<0.00050	<0.10	<0.10	<0.10	<0.0010	32	8.46
	16-Jun-2023	7.77	**7830**	13.4	8.26	**9.680**	**8.100**	710	756	922	<1.0	<1.0	170	69.4	12.6	**2.440**	<10.0	<0.400	**4.930**	-	-	102	0.378	<0.400	<0.200	<0.447	0.735	<0.00050	<0.00050	<0.00050	<0.00040	<0.00030	<0.00050	<0.00050	<0.10	<0.100	<0.10	<0.0010	21	7.86
MW25B	30-May-2014	7.4	**9910**	7.2	8.12	**9400**	**8300**	-	-	1100	<0.50	-	190	54	11	**2300**	1.9	-	**5200**	-	-	-	0.59	0.42	-	-	0.84	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	35	9
	28-May-2015	7.8	**10,020**	8.2	7.85	**9500**	**7600**	690	850	1000	<0.50	<0.50	190	53	12	**2200**	2.2	-	**4600**	-	-	0.97	0.29	0.77	0.016	0.78	0.86	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	29	9.9
	8-Jun-2016	7.56	**9510**	8.6	8.09	**9500**	**7300**	680	790	970	<0.50	<0.50	190	51	12	**2100**	2.5	-	**4500**	-	-	0.95	0.58	0.62	0.019	0.64	1.2	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	30	10
	7-Jun-2017	7.4	**9720**	7.5	8.14	**9500**	**7100**	700	840	1000	<0.5	<0.5	190	54	12	**2200**	2.3	-	**4100**	-	-	6.0	0.44	2.5	<0.16	-	0.87	<0.00040	<0.00040	<0.00040	-	-	<0.0008	-	-	<0.10	<0.10	-	27	12
	26-Jun-2018	7.7	**9200**	7.6	7.85	**9600**	**7800**	710	840	1000	<1.0	<1.0	200	54	13	**2400**	2.3	-	**4600**	-	-	2.2	<0.015	0.6	**0.05**	0.65	0.55	<0.00040	<0.00040	<0.00040	-	-	<0.00089	<0.0005	-	<0.10	<0.10	<0.002	27	10
	17-Jun-2019	7.52	**9250**	11.5	8.17	**9500**	**7500**	680	850	1000	<1.0	<1.0	190	52	12	**2400**	2.7	-	**4400**	110	120	0.89	0.15	0.8	0.018	0.82	0.52	<0.00040	<0.00040	<0.00040	<0.00080	<0.00040	<0.00089	<0.00050	<0.10	<0.10	<0.10	<0.0015	32	11
	7-Jun-2020	7.2	**9430**	11.8	8.14	**9400**	**7600**	680	790	960	<1.0	<1.0	190	51	11	**2300**	2.5	-	**4500**	110	110	1.8	0.07	0.97	<0.010	0.97	0.48	<0.00040	<0.00040	<0.00040	<0.00080	<0.00040	<0.00089	<0.00050	<0.10	<0.10	<0.10	<0.0015	26	10
	3-Jun-2021	7.3	**9090**	9.6	8.18	**7720**	**8150**	718	795	970	<5.0	<5.0	198	54.2	11.7	**2340**	<5.0	<0.20	**5060**	-	-	96	0.122	0.93	<0.10	0.93	0.37	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00071	<0.00050	<0.10	<0.10	<0.10	0.0017	23	9.3
	10-Jun-2022	7.58	**11060**	9.6	8.16	**8920**	**7780**	656	890	1080	<1.0	<1.0	180	50.2	10.6	**2080**	<2.5	0.133	**4900**	120	104	86.7	0.477	0.63	0.06	0.685	0.813	<0.00050	<0.00050	<0.00050	<0.00030	<0.00040	<0.00050	<0.00050	<0.10	<0.100	<0.10	<0.0010	32	10.8
	16-Jun-2023	7.93	**7830**	13.4	8.21	**9.270**	**7.720**	667	752	918	<1.0	<1.0	182	51.7	11.8	**2.340**	<10.0	<0.400	**4.660**	-	-	103	0.35	0.549	<0.200	0.549	0.618	<0.00050	<0.00050	<0.00050	<0.00040	<0.00030	<0.00050	<0.00050	<0.10	<0.100	<0.10	<0.0010	25	10.3

Notes:
[1] Alberta Environment and Parks (AEP). 2022. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. ISBN 978-1-4601-5501-1. Referenced guidelines are for fine textured soils under Agricultural land use
[2] Alberta Environment and Parks (AEP). Environmental Quality Guidelines for Alberta Surface Waters. March 2018. Table 1 Surface water quality guidelines for the protection of freshwater aquatic life (PAL). Most conservative values applied (chronic or acute).
[3] Guideline varies with hardness.
[4] Guideline varies with pH and temperature.
[5] Guideline varies with chloride.
[6] Guideline varies with pH.
"-" No applicable guideline or not analyzed.
BOLD - Greater than Tier 1 Guideline.
italic - Detection limit greater than Tier 1 guideline.
* - laboratory filtered.

TETRA TECH

Table 4b: Field and Groundwater Analytical Results Summary - Upper Sandstone Wells

Parameter Group		Field			Routine																		Nutrients					Hydrocarbons										Organics		
Parameter		pH	Electrical Conductivity	Temperature	pH	Electrical Conductivity	Total Dissolved Solids	Hardness	Alkalinity, total (as CaCO3)	Bicarbonate	Carbonate	Hydroxide	Calcium	Magnesium	Potassium	Sodium	Chloride	Fluoride	Sulphate	Anions Total	Cations Total	Ionic Balance	Ammonia-N	Nitrate (N)	Nitrite (N)	Nitrate and Nitrate (N)	Total Kjeldahl Nitrogen	Benzene	Toluene	Ethylbenzene	Xylenes (m & p)	Xylene (o)	Xylenes	Styrene	F1 (C6-C10)	F1-BTEX	F2 (C10-C16)	Total Phenols	Chemical Oxygen Demand	Dissolved Organic Carbon
Unit		pH Units			pH Units	µS/cm	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	-	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		6.5-8.5	1000	-	6.5-8.5	1000	500	-	-	-	-	-	-	-	-	200	100	1	128-429	-	-	-	0.018-190	3	0.02-0.20	100	-	0.005	0.024	0.0016	-	-	0.02	0.072	2.2	2.2	1.1	-	-	-
Monitoring Well	Date																																							
MW26B	30-May-2014	7.7	**5280**	5.8	8.09	**6100**	**4900**	-	-	960	<0.50	n/a	73	36	5.0	**1400**	1.7	-	**3000**	-	-	-	0.52	0.052	-	-	0.89	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	49	7.3
	28-May-2015	7.5	**7450**	9.1	7.93	**7100**	**5600**	490	830	1000	<0.50	<0.50	100	56	8.3	**1600**	3.5	-	**3300**	-	-	0.95	0.43	0.23	0.039	0.27	0.86	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	24	9.0
	8-Jun-2016	7.63	**6450**	8.9	8.15	**7400**	**5600**	500	810	990	<0.50	<0.50	110	58	7.7	**1600**	3.9	-	**3400**	-	-	0.91	0.43	0.19	0.036	0.23	0.73	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	35	10
	7-Jun-2017	7.4	**7810**	5.9	8.19	**7600**	**5700**	570	860	1000	<0.5	<0.5	120	66	7.5	**1800**	4.5	-	**3200**	-	-	3.1	0.66	0.42	<0.16	-	0.99	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	28	12
	26-Jun-2018	6.85	**6850**	6.7	8.12	**7400**	**5800**	560	860	1100	<1.0	<1.0	120	67	8.0	**1800**	5.6	-	**3300**	-	-	3.7	0.49	0.09	0.012	0.1	1.1	<0.00040	<0.00040	<0.00040	-	-	<0.00089	<0.0005	-	<0.10	<0.10	<0.002	29	9.6
	17-Jun-2019	7.52	**7786**	11.5	8.19	**7700**	**5800**	540	830	1000	<1.0	<1.0	110	64	7.5	**1800**	6	-	**3400**	87	88	0.58	0.6	0.048	0.027	0.074	0.98	<0.00040	<0.00040	<0.00040	<0.00080	<0.00040	<0.00089	<0.00050	<0.10	<0.10	<0.10	0.0015	44	12
	5-Jun-2020	7.08	**7650**	7.00	8.16	**7500**	**5700**	580	790	960	<1.0	<1.0	120	65	7.4	**1800**	5.6	-	**3300**	84	91	4.0	0.58	0.18	**0.10**	0.29	0.96	<0.00040	<0.00040	<0.00040	<0.00080	<0.00040	<0.00089	<0.00050	<0.10	<0.10	<0.10	<0.0015	34	10
	3-Jun-2021	7.27	**7250**	12.20	8.35	**6650**	**6430**	585	809	973	6.6	<5.0	121	68.8	7.87	**1800**	5.6	0.32	**3940**	-	-	91.7	0.50	0.24	**<0.10**	0.24	0.98	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00071	<0.00050	<0.10	<0.10	<0.10	0.0019	23	10.2
	10-Jun-2022	7.08	**8970**	11.00	8.35	**7240**	**6040**	572	940	1130	9.1	<1.0	116	68.5	7.42	**1680**	5.4	0.338	**3570**	93.3	84.7	90.8	0.49	0.214	**<0.050**	0.214	0.903	<0.00050	<0.00050	<0.00050	<0.00030	<0.00040	<0.00050	<0.00050	<0.10	<0.10	<0.10	<0.0010	34	11.7
	16-Jun-2023	8.00	**3990**	12.7	8.38	**7,600**	**6,120**	614	811	963	13.1	<1.0	121	75.7	8.41	**1,850**	<10.0	<0.400	**3,550**	-	-	103	0.162	0.545	<0.200	0.545	0.592	<0.00050	<0.00050	<0.00050	<0.00040	<0.00030	<0.00050	<0.00050	<0.10	<0.100	<0.10	<0.0010	33	11.9
MW27B	30-May-2014	7.5	**11,560**	9.8	8.14	**11,000**	**10,000**	-	-	1700	<0.50	-	130	110	9.2	**2800**	40	-	**6100**	-	-	-	0.51	0.29	-	-	1.5	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	64	13
	28-May-2015	8.1	**11,530**	9.1	7.97	**11,000**	**9000**	740	1400	1700	<0.50	<0.50	130	100	11	**2700**	35	-	**5100**	-	-	0.99	0.15	1.1	0.01	1.1	1.0	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	35	13
	8-Jun-2016	7.74	**11,530**	7.8	8.19	**11,000**	**9100**	770	1300	1600	<0.50	<0.50	140	100	11	**2700**	42	-	**5300**	-	-	0.97	0.42	0.91	0.014	0.92	0.55	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	37	15
	7-Jun-2017	7.6	**11,410**	8.3	8.10	**12,000**	**9400**	860	1500	1900	<0.50	<0.5	140	130	11	**3100**	51	-	**5100**	-	-	4.4	0.67	1.5	**0.21**	-	1.4	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	43	18
	26-Jun-2018	7.40	**12,540**	6.9	7.96	**12,000**	**9700**	830	1500	1800	<1.0	<1.0	150	110	11	**3100**	49	-	**5400**	-	-	2.5	0.16	1.0	<0.01	1.0	1.1	<0.00040	<0.00040	<0.00040	-	-	<0.00089	<0.0005	-	<0.10	<0.10	0.0024	43	13
	17-Jun-2019	7.60	**11,470**	11.2	8.22	**12,000**	**9600**	820	1500	1800	<1.0	<1.0	140	120	10	**3000**	74	-	**5300**	140	150	2.1	0.20	<0.010	0.029	0.029	0.99	<0.00040	<0.00040	<0.00040	<0.00080	<0.00040	<0.00089	<0.00050	<0.10	<0.10	<0.10	<0.0015	37	16
	4-Jun-2020	7.40	**11,570**	8.3	8.12	**12,000**	**9900**	830	1300	1600	<1.0	<1.0	140	110	10	**3200**	94	-	**5500**	140	160	4.8	0.17	1.4	0.022	1.5	0.85	<0.00040	<0.00040	<0.00040	<0.00080	<0.00040	<0.00089	<0.00050	<0.10	<0.10	<0.10	<0.0015	33	14
	2-Jun-2021	7.70	**10,660**	11.7	8.23	**10,400**	**10300**	845	1430	1750	<5.0	<5.0	142	119	10.3	**3080**	**122**	0.62	**6010**	-	-	96.1	0.40	0.99	<0.10	0.99	0.81	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00071	<0.00050	<0.10	<0.10	<0.10	0.0054	35	12.6
	10-Jun-2022	8.46	**3,290**	9.8	8.35	**11,200**	**10100**	793	1670	2010	13.8	<1.0	133	112	9.88	**2740**	**174**	0.507	**5860**	160	135	84.4	0.71	0.384	<0.10	0.384	1.22	<0.00050	<0.00050	<0.00050	<0.00030	<0.00040	<0.00050	<0.00050	<0.10	<0.10	<0.10	<0.0010	41	14.5
	16-Jun-2023	7.82	**19,570**	12.7	8.48	**11,800**	**9680**	833	1260	1470	33.5	<1.0	126	126	10.8	**3000**	**173**	0.522	**5460**	-	-	102	0.54	<0.400	<0.200	<0.447	1.33	<0.00050	<0.00050	<0.00050	<0.00040	<0.00030	<0.00050	<0.00050	<0.10	<0.100	<0.10	<0.0010	42	13.7
	29-Oct-2023	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**164**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW28B	30-May-2014	7.4	**12,780**	6.5	8.08	**12,000**	**11,000**	-	-	1100	<0.50	-	230	89	11	**3200**	37	-	**6900**	-	-	-	1.6	0.075	-	-	2.5	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	61	15
	28-May-2015	7.8	**13,020**	7.2	7.90	**12,000**	**10,000**	940	900	1100	<0.50	<0.50	220	95	13	**3900**	35	-	**6500**	-	-	0.95	1.2	0.24	0.094	0.34	2.0	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	45	16
	8-Jun-2016	7.58	**12,860**	7.8	8.14	**13,000**	**10,000**	920	840	1000	<0.50	<0.50	210	93	13	**2800**	33	-	**6700**	-	-	0.91	1.4	0.31	0.038	0.35	2.1	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	48	17
	7-Jun-2017	7.5	**12,890**	6.2	8.08	**12,000**	**9700**	960	870	1100	<0.50	<0.50	220	100	12	**3200**	30	-	**5700**	-	-	7.3	1.6	<0.22	**0.38**	-	2.1	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	35	17
	26-Jun-2018	7.30	**13,570**	7.4	7.86	**13,000**	**11,000**	1000	860	1000	<1.0	<1.0	230	110	12	**3300**	28	-	**6500**	-	-	3.5	1.1	0.39	0.043	0.43	1.7	<0.00040	<0.00040	<0.00040	-	-	<0.00089	<0.0005	-	<0.10	<0.10	<0.002	37	14
	17-Jun-2019	7.46	**12,490**	9.5	8.11	**13,000**	**11,000**	1100	840	1000	<1.0	<1.0	240	120	13	**3600**	27	-	**6200**	150	180	5.8	1.1	<0.010	0.038	0.038	2	<0.00040	<0.00040	<0.00040	<0.00080	<0.00040	<0.00089	<0.00050	<0.10	<0.10	<0.10	<0.0015	45	15
	4-Jun-2020	7.45	**12,830**	7.1	8.1	**13,000**	**11,000**	1000	790	960	<1.0	<1.0	240	100	12	**3500**	27	-	**6600**	150	170	5.3	1.5	0.36	0.026	0.39	1.9	<0.00040	<0.00040	<0.00040	<0.00080	<0.00040	<0.00089	<0.00050	<0.10	<0.10	<0.10	<0.0015	41	14
	2-Jun-2021	7.58	**11,280**	8.5	8.1	**11,300**	**12,200**	1040	816	995	<5.0	<5.0	235	109	12	**3360**	25.4	0.23	**7990**	-	-	91.2	1.4	0.27	<0.10	0.27	2.6	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00071	<0.00050	<0.10	<0.10	<0.10	0.0035	39	12.1
	10-Jun-2022	8.36	**3,900**	9.3	8.27	**10,900**	**11,400**	981	924	1130	<1.0	<1.0	223	103	11	**2970**	24.3	<0.20	**7510**	176	149	84.6	**1.61**	<0.20	<0.10	0.224	2.1	<0.00050	<0.00050	<0.00050	<0.00030	<0.00040	<0.00050	<0.00050	<0.10	<0.100	<0.10	<0.0010	38	14.3
	16-Jun-2023	8.04	**10,860**	12.3	8.29	**12,800**	**10,700**	1,040	708	860	1.9	<1.0	232	111	12.5	**3,140**	24	<0.400	**6,770**	-	-	101	**1.68**	<0.400	<0.200	<0.447	2.18	<0.00050	<0.00050	<0.00050	<0.00040	<0.00030	<0.00050	<0.00050	<0.10	<0.100	<0.10	0.0032	39	13.2
MW29A	4-Jun-2015	8.5	**4740**	6.7	8.28	**4900**	**3600**	220	560	680	<0.50	<0.50	72	9.9	7.4	**1200**	7.3	-	**2000**	-	-	1.0	**4.3**	0.054	**0.084**	0.14	16	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	1100	13
	8-Jun-2016	8.15	**3440**	7.0	8.41	**3400**	**2400**	100	590	710	7.7	<0.50	33	5.1	4.1	**810**	3.3	-	**1200**	-	-	1.0	**1.2**	0.063	0.014	0.077	1.3	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	55	8.3
	7-Jun-2017	8.1	**3740**	6.5	8.34	**3400**	**2400**	100	630	760	3.0	<0.50	32	5.2	4.1	**810**	3.6	-	**1100**	-	-	2	**1.4**	0.33	**1.1**	-	1.6	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	25	9.1
	26-Jun-2018	7.48	**3440**	8.4	8.33	**3400**	**2400**	95	640	770	4.2	<1.0	30	4.8	3.8	**850**	3.2	-	**1100**	-	-	3.6	0.9	0.32	0.026	0.35	1.3	<0.00040	<0.00040	<0.00040	-	-	<0.00089	<0.0005	-	<0.10	<0.10	<0.0020	22	7.7
	17-Jun-2019	8.06	**3760**	8.8	8.45	**3500**	**2300**	100	630	740	16	<1.0	32	5.1	3.7	**810**	3.5	-	**1100**	36	37	2.7	**1.1**	0.18	**0.089**	0.27	1.7	<0.00040	<0.00040	<0.00040	<0.00080	<0.00040	<0.00089	<0.00050	<0.10	<0.10	<0.10	<0.0015	58	9.1
	4-Jun-2020	7.89	**3560**	6.8	8.13	**3500**	**2400**	120	620	760	<1.0	<1.0	37	7.3	3.9	**840**	3.6	-	**1200**	37	39	2.8	1.1	0.24	**0.08**	0.32	1.5	<0.00040	<0.00040	<0.00040	<0.00080	<0.00040	<0.00089	<0.00050	<0.10	<0.10	<0.10	<0.0015	22	8.1
	2-Jun-2021	7.61	**3260**	9.1	8.37	**3190**	**2560**	127	624	745	7.9	<5.0	37.4	8.06	4.01	**833**	2.8	0.4	**1300**	-	-	98.2	1.16	0.26	**<0.050**	0.26	1.32	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00071	<0.00050	<0.10	<0.10	<0.10	<0.0010	26	8.8
	10-Jun-2022	7.11	**10180**	8.7	8.58	**3480**	**2670**	156	723	831	25.3	<1.0	44.8	10.7	3.9	**777**	3.04	0.478	**1370**	43.1	37.1	86.1	1.22	0.147	**<0.05**	0.147	1.6	<0.0005	<0.0005	<0.0005	<0.0003	<0.0004	<0.0005	<0.0005	<0.1	<0.1	<0.10	<0.0010	34	9.52
	16-Jun-2023	8.31	**3180**	11.4	**8.59**	**3,540**	**2,520**	138	627	718	23.2	<1.0	39.9	9.21	4.07	**812**	2.94	0.379	**1,250**	-	-	99	**1.2**	0.235	<0.050	0.235	1.64	<0.00050	<0.00050	<0.00050	<0.00040	<0.00030	<0.00050	<0.00050	<0.10	<0.100	<0.10	0.0014	28	8.85
MW30A	4-Jun-2015	8.5	**2400**	7.5	8.34	**2300**	**1500**	48	640	770	3.5	<0.50	16	2.2	2.9	**540**	5.3	-	**510**	-	-	1.0	**0.78**	0.013	<0.033	0.023	2.6	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	130	15
	8-Jun-2016	8.29	**2320**	8.7	8.37	**2200**	**1500**	36	650	780	5.3	<0.50	12	1.6	2.4	**540**	3.0	-	**510**	-	-	1.0	0.42	0.16	**0.046**	0.21	1.1	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	43	9.9
	7-Jun-2017	8.2	**2020**	7.0	**8.57**	**1900**	**1200**	28	660	770	17	<0.5	8.9	1.4	2.2	**460**	1.3	-	**360**	-	-	0.27	0.46	0.19	**0.081**	-	0.8	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	23	7.8
	26-Jun-2018	7.98	**1932**	8.4	8.44	**1900**	**1200**	25	650	770	12	<1.0	7.9	1.3	2.1	**450**	1.5	-	**350**	-	-	0.61	0.39	0.1	<0.01	0.1	0.75	<0.00040	<0.00040	<0.00040	-	-	<0.00089	<0.0005	-	<0.10	<0.10	<0.0020	57	7.1
	17-Jun-2019	8.19	**2180**	10.1	**8.53**	**2000**	**1200**	26	640	740	23	<1.0	8.3	1.4	2	**430**	1.3	-	**350**	20	19	2.4	0.40	0.086	0.01	0.096	0.76	<0.00040	<0.00040	<0.00040	<0.00080	<0.00040	<0.00089	<0.00050	<0.10	<0.10	<0.10	<0.0015	24	8.7
	29-May-2020	8.08	**1994**	6.9	8.4	**2000**	**1200**	27	610	730	7.9	<1.0	8.8	1.3	1.8	**420**	2.2	-	**360**	20	19	2.2	0.40	0.088	**0.023**	0.11	0.79	<0.00040	<0.00040	<0.00040	<0.00080	<0.00040	<0.00089	<0.00050	<0.10	<0.10	0.15	<0.0015	22	7.3
	2-Jun-2021	7.87	**1817**	7.1	**8.54**	**1750**	**1280**	24.2	636	744	15.7	<5.0	7.14	1.55	2.3	**504**	0.71	0.57	**380**	-	-	109	0.41	0.131	**0.012**	0.143	0.53	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00071	<0.00050	<0.10	<0.10	<0.10	<0.0010	28	8.3
	10-Jun-2022	8.09	**2280**	8.4	**8.68**	**1870**	**1310**	27.8	755	860	30.1	<1.0	8.64	1.5	2.1	**438**	0.82	0.635	**381**	23.1	19.7	85.3	0.41	0.151	**0.016**	0.167	0.823	<0.00050	<0.00050	<0.00050	<0.00030	<0.00040	<0.00050	<0.00050	<0.10	<0.10	<0.10	<0.0010	27	8.4
	15-Jun-2023	8.33	**8330**	8.6	**8.89**	**1,940**	**1,270**	27.6	660	722	40.8	<1.0	8.59	1.49	2.16	**470**	<2.50	0.507	**375**	-	-	100	0.414	0.164	<0.050	0.164	0.868	<0.00050	<0.00050	<0.00050	<0.00040	<0.00030	<0.00050	<0.00050	<0.10	<0.100	<0.10	<0.0010	34	8.62
MW31A	4-Jun-2015	**8.6**	**1980**	10.5	**8.57**	**1900**	**1100**	32	790	920	22	<0.50	7.8	3.1	3.2	**420**	12	-	**220**	-	-	0.94	**1.1**	0.017	0.013	0.03	5.2	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	560	19
	8-Jun-2016	**8.53**	**1720**	9.5	**8.53**	**1800**	**1000**	11	800	940	18	<0.50	4.5	<2.0	<3.0	**430**	6.7	-	120	-	-	1.0	**1.1**	2.0	0.028	2.0	1.0	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	380	17
	7-Jun-2017	-	-	-	**8.57**	**1700**	**1100**	15	880	1000	23	<0.50	4.9 *	0.52 *	1.9 *	**470**	5.2	-	76	-	-	3.2	**1.2**	**14**	**0.077**	3.2	7.4	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	300	-
	26-Jun-2018	8.03	**1796**	13.8	8.48	**1700**	**1100**	15	900	1100	19	<1.0	4.9	0.51	1.6	**440**	11	-	67	-	-	2.0	0.52	1.5	<0.01	1.5	1.9	<0.00040	<0.00040	<0.00040	-	-	<0.00089	<0.0005	-	<0.10	<0.10	<0.0020	140	11
	17-Jun-2019	8.46	**1702**	10.5	**8.66**	**1800**	**1000**	10	910	990	57	<1.0	3.5	0.35	1.5	**410**	8.5	-	58	20	18	3.9	**0.61**	1.9	<0.010	1.9	3	<0.00040	<0.00040	<0.00040	<0.00080	<0.00040	<0.00089	<0.00050	<0.10	<0.10	<0.10	<0.0015	270	18
	5-Jun-2020	8.13	**1728**	8.7	8.46	**1800**	**1100**	13	880	1000	16	<1.0	4.4	0.43	1.6	**470**	4.9	-	51	19	21	4.7	0.47	1.8	<0.010	1.8	1.0	<0.00040	<0.00040	<0.00040	<0.00080	<0.00040	<0.00089	<0.00050	<0.10	<0.10	<0.10	<0.0015	89	9.5
	3-Jun-2021	8.21	**1610**	10.6	**8.55**	**1470**	**1070**	12.4	943	1110	20.8	<5.0	4.28	0.42	1.6	**451**	3.22	0.957	39	-	-	99.8	0.338	1.87	**0.087**	1.96	1.1	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00071	<0.00050	<0.10	<0.10	<0.10	0.0049	38	10.8
	10-Jun-2022	7.82	**2090**	9.7	**8.71**	**1710**	**1180**	14.4	1130	1290	44	<1.0	4.9	0.53	1.65	**428**	3.23	1.1	43.4	23.7	19	80.2	0.354	0.314	**0.047**	0.361	0.7	<0.00050	<0.00050	<0.00050	<0.00030	<0.00040	<0.00050	<0.00050	<0.10	<0.10	<0.10	<0.0010	38	11.1
	16-Jun-2023	8.52	**807**	20	**8.96**	**1,760**	**1,100**	13.1	938	1,020	63.5	<1.0	4.42	0.499	1.75	**476**	3.31	**1.06**	34	-	-	107	**0.519**	0.09	**0.083**	0.173	1.26	<0.00050	<0.00050	<0.00050	<0.00040	<0.00030	<0.00050	<0.00050	<0.10	<0.100	<0.10	<0.0010	54	11.6

Notes:

[1] Alberta Environment and Parks (AEP). 2022. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. ISBN 978-1-4601-5501-1. Referenced guidelines are for fine textured soils under Agricultural land use

[2] Alberta Environment and Parks (AEP). Environmental Quality Guidelines for Alberta Surface Waters. March 2018. Table 1 Surface water quality guidelines for the protection of freshwater aquatic life (PAL). Most conservative values applied (chronic or acute).

[3] Guideline varies with hardness.

[4] Guideline varies with pH and temperature.

[5] Guideline varies with chloride.

[6] Guideline varies with pH.

"-" No applicable guideline or not analyzed.

BOLD - Greater than Tier 1 Guideline.

Italic - Detection limit greater than Tier 1 guideline.

* - laboratory filtered.

TETRA TECH

Table 4b: Field and Groundwater Analytical Results Summary - Upper Sandstone Wells

Parameter Group		Field			Routine																			Nutrients					Hydrocarbons										Organics		
	Parameter	pH	Electrical Conductivity	Temperature	pH	Electrical Conductivity	Total Dissolved Solids	Hardness	Alkalinity, total (as CaCO3)	Bicarbonate	Carbonate	Hydroxide	Calcium	Magnesium	Potassium	Sodium	Chloride	Fluoride	Sulphate	Anions Total	Cations Total	Ionic Balance	Ammonia-N	Nitrate (N)	Nitrite (N)	Nitrate and Nitrate (N)	Total Kjeldahl Nitrogen	Benzene	Toluene	Ethylbenzene	Xylenes (m & p)	Xylene (o)	Xylenes	Styrene	F1 (C6-C10)	F1-BTEX	F2 (C10-C16)	Total Phenols	Chemical Oxygen Demand	Dissolved Organic Carbon
	Unit	pH Units			pH Units	µS/cm	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	-	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		6.5-8.5	1000	-	6.5-8.5	1000	500	-	-	-	-	-	-	-	-	200	100	1	128-429	-	-	-	0.018-190	3	0.02-0.20	100	-	0.005	0.024	0.0016	-	-	0.02	0.072	2.2	2.2	1.1	-	-	-
Monitoring Well	Date																																								
MW33A	28-May-2015	**8.6**	**2540**	6.9	8.32	**3300**	**2400**	130	870	1100	2.6	<0.50	35	10	5.8	**930**	28	-	**860**	-	-	1.2	**1.3**	<0.010	<0.010	<0.010	8.0	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	460	39
	8-Jun-2016	**8.66**	**2010**	7.0	**8.52**	**2100**	**1200**	24	840	990	16	<0.50	7.4	1.4	2.2	**480**	27	-	**230**	-	-	0.96	**0.89**	<0.010	<0.010	<0.020	2.6	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	140	33
	7-Jun-2017	-	-	-	**8.52**	**1800**	**1100**	15	840	990	18	<0.50	4.7	0.7	1.4	**390**	24	-	**130**	-	-	7.7	**0.79**	<0.044	<0.033	<0.010	2.4	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	130	25
	26-Jun-2018	**8.97**	**2370**	10.9	**8.57**	**1800**	**1100**	19	930	1100	30	<1.0	6.4	0.81	2	**460**	28	-	75	-	-	0.47	**0.70**	0.021	<0.01	0.021	1.5	<0.00040	<0.00040	<0.00040	-	-	<0.00089	<0.0005	-	<0.10	<0.10	<0.0020	110	26
	12-Jun-2019	**8.54**	**1859**	9.6	**8.72**	**1800**	**1000**	11	890	960	60	<1.0	3.6	0.41	1.5	**410**	24	-	51	20	18	3.2	**1.40**	<0.010	<0.010	<0.014	9.2	<0.00040	<0.00040	<0.00040	<0.00080	<0.00040	<0.00089	<0.00050	<0.10	<0.10	<0.10	0.0051	730	23
	4-Jun-2020	**8.81**	**1768**	8.1	8.45	**1800**	**1100**	12	860	1000	15	<1.0	4	0.52	1.5	**450**	24	-	59	19	20	2.5	**0.58**	<0.010	<0.010	<0.014	1.1	<0.00040	<0.00040	<0.00040	<0.00080	<0.00040	<0.00089	<0.00050	<0.10	<0.10	<0.10	0.0051	67	27
	4-Jun-2021	**8.71**	**1527**	8.9	8.76	**1410**	**937**	10.9	747	841	34.3	<5.0	3.59	0.48	1.62	**413**	18.4	**1.88**	49.7	-	-	110	**0.412**	0.091	<0.010	0.091	2.72	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00071	<0.00050	<0.10	<0.10	<0.10	0.0022	146	24
	10-Jun-2022	**8.62**	**2080**	7.8	8.78	**1780**	**1200**	11.7	1090	1230	52.3	<1.0	3.87	0.499	1.49	**445**	21.2	**2.03**	35.6	23.2	19.7	84.9	**0.735**	<0.020	0.012	<0.050	1.73	<0.00050	<0.00050	<0.00050	<0.00030	<0.00040	<0.00050	<0.00050	<0.10	<0.10	<0.10	<0.0010	112	29.5
	15-Jun-2023	**8.92**	**1779**	11	**8.96**	**1,760**	**1,100**	13.1	938	1,020	63.5	<1.0	4.42	0.499	1.75	**476**	3.31	**1.06**	34	-	-	107	**0.519**	0.09	**0.083**	0.173	1.26	<0.00050	<0.00050	<0.00050	<0.00040	<0.00030	<0.00050	<0.00050	<0.10	<0.100	<0.10	<0.0010	112	26.5
15MW35B	8-Jun-2016	7.83	**8080**	7.6	8.16	**7700**	**6000**	300	650	790	<0.50	<0.50	99	14	7.8	**1800**	5.2	-	**3700**	-	-	0.95	**1.9**	0.42	<0.010	0.42	2.7	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	37	8.2
	7-Jun-2017	7.8	**7270**	8.0	8.22	**7600**	**5700**	300	640	780	<0.50	<0.50	98	14	8.6	**1800**	6.8	-	**3300**	-	-	2.3	**2.0**	2.5	*<0.16*	-	2.5	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	66	12
	26-Jun-2018	7.05	**8530**	7.1	8.12	**7700**	**6000**	330	680	830	<1.0	<1.0	110	15	8.4	**2000**	6.3	-	**3500**	-	-	2.8	1.3	0.76	<0.01	0.76	2.0	<0.00040	<0.00040	<0.00040	-	-	<0.00089	<0.0005	-	<0.10	<0.10	<0.0020	33	10
	17-Jun-2019	7.7	**7970**	9.9	8.27	**7800**	**6100**	360	680	820	<1.0	<1.0	120	16	9.1	**2100**	6.3	-	**3400**	85	100	8	1.2	1.6	0.019	1.6	1.7	<0.00040	0.0004	<0.00040	<0.00080	<0.00040	<0.00089	<0.00050	<0.10	<0.10	<0.10	0.0038	37	10
	5-Jun-2020	7.7	**7410**	7.5	8.21	**7800**	**6100**	340	640	780	<1.0	<1.0	110	15	7.8	**2000**	6.6	-	**3600**	88	93	2.7	1.1	1.5	0.026	1.5	1.5	<0.00040	0.0004	<0.00040	<0.00080	<0.00040	<0.00080	<0.00050	<0.10	<0.10	<0.10	<0.0015	28	8.9
	2-Jun-2021	7.6	**7250**	11.4	8.2	**7010**	**6520**	327	726	886	<5.0	<5.0	107	14.5	8.06	**1970**	5.7	0.21	**3970**	-	-	95.0	1.48	1.06	<0.10	1.06	1.47	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00071	<0.00050	<0.10	<0.10	<0.10	0.0037	28	8.3
	9-Jun-2022	7.5	**8930**	11.2	8.17	**7530**	**5940**	308	726	886	<1.0	<1.0	100	14.1	7.16	**1720**	6.1	0.299	**3630**	90.4	81.2	89.8	1.29	1.04	0.195	1.24	2.1	<0.00050	<0.00050	<0.00050	<0.00030	<0.00040	<0.00050	<0.00050	<0.10	<0.10	<0.10	<0.0010	37	10.3
	16-Jun-2023	8.23	**3560**	19.4	8.28	**7,650**	**5,970**	309	643	784	<1.0	<1.0	101	13.7	7.78	**1,820**	<10.0	<0.400	**3,620**	-	-	96.9	**1.42**	0.753	<0.200	0.753	1.7	<0.00050	<0.00050	<0.00050	<0.00040	<0.00030	<0.00050	<0.00050	<0.10	<0.100	<0.10	<0.0010	30	9.94

Notes:

[1] Alberta Environment and Parks (AEP). 2022. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. ISBN 978-1-4601-5501-1. Referenced guidelines are for fine textured soils under Agricultural land use

[2] Alberta Environment and Parks (AEP). Environmental Quality Guidelines for Alberta Surface Waters. March 2018. Table 1 Surface water quality guidelines for the protection of freshwater aquatic life (PAL). Most conservative values applied (chronic or acute).

[3] Guideline varies with hardness.

[4] Guideline varies with pH and temperature.

[5] Guideline varies with chloride.

[6] Guideline varies with pH.

"-" No applicable guideline or not analyzed.

BOLD - Greater than Tier 1 Guideline.

Italic - Detection limit greater than Tier 1 guideline.

[+] - laboratory filtered.

TETRA TECH

Table 4b: Field and Groundwater Analytical Results Summary - Upper Sandstone Wells

Parameter Group		Dissolved Metals																																			
	Parameter	Aluminum	Antimony	Arsenic	Barium	Beryllium	Bismuth	Boron	Cadmium	Cesium	Chromium	Cobalt	Copper	Iron	Lead	Lithium	Manganese	Mercury	Molybdenum	Nickel	Phosphorus	Rubidium	Selenium	Silicon	Silver	Strontium	Sulphur	Tellurium	Thallium	Thorium	Tin	Titanium	Tungsten	Uranium	Vanadium	Zinc	Zirconium
	Unit	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		0.007-0.05	0.006	0.005	1	-	-	1.0	0.00004-0.00037	-	0.05	-	0.007	0.3	0.001-0.007	-	0.05	0.000005	-	0.007-0.17	-	-	0.002	-	0.0001	-	-	-	-	-	-	-	-	0.01	-	0.03	-
Monitoring Well	Date																																				
MW1C	30-May-2014	-	<0.0060	-	<0.10	-	-	-	<0.000050	-	<0.010	-	<0.0020	*<0.60*	<0.0020	-	-	<0.0000050	-	<0.0050	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.030	-
	28-May-2015	<0.030	<0.0060	<0.0020	0.025	-	-	0.24	<0.00020	-	<0.010	-	<0.0020	<0.060	<0.0020	-	**0.27**	<0.0000050	-	<0.0050	-	-	<0.0020	-	*<0.0010*	-	-	-	-	-	-	-	-	<0.0010	-	<0.030	-
	8-Jun-2016	0.0079	<0.0060	0.0011	0.023	-	-	0.24	0.000024	-	<0.010	-	0.00070	<0.060	<0.0020	-	**0.28**	<0.0000020	-	0.0021	-	-	<0.0020	-	<0.00010	-	-	-	-	-	-	-	-	0.0036	-	0.0037	-
	7-Jun-2017	0.0069	<0.00061	0.00068	<0.1	-	-	0.24	<0.00002	-	<0.0010	-	0.00039	*<0.60*	<0.0002	-	**0.28**	<0.000002	-	0.0013	-	-	<0.00020	-	<0.00010	-	-	-	-	-	-	-	-	0.00022	-	<0.003	-
	26-Jun-2018	<0.0030	<0.00062	0.00068	<0.10	-	-	0.24	<0.000020	-	<0.0010	-	0.00043	*<0.60*	<0.00020	-	**0.27**	<0.0000020	-	0.0016	-	-	<0.00020	-	<0.00010	-	-	-	-	-	-	-	-	0.00018	-	<0.0030	-
	12-Jun-2019	0.0056	<0.00060	0.00077	0.02	<0.0010	-	0.25	<0.000024	-	<0.0010	0.00067	0.0028	<0.060	<0.00020	0.32	**0.21**	<0.0000020	0.00086	0.0012	<0.10	-	<0.00020	4	<0.00010	2.1	960	-	<0.00020	-	<0.0010	<0.0010	-	0.00012	<0.0010	<0.0030	-
	5-Jun-2020	0.012	<0.00060	0.0005	0.015	<0.001	-	0.24	<0.000020	-	<0.0010	0.00064	0.0040	0.07	<0.00020	0.32	**0.21**	<0.0000019	0.00047	0.0012	<0.1	-	<0.00020	4.5	<0.00010	2	910	-	<0.0002	-	<0.001	0.0014	-	0.00013	<0.001	<0.0030	-
	4-Jun-2021	<0.0050	<0.00050	0.00052	0.0144	<0.00050	<0.00025	0.238	<0.000025	<0.000050	<0.00050	0.00068	<0.0010	<0.050	<0.00025	0.288	**0.168**	<0.0000050	0.00052	<0.0025	<0.25	0.007	<0.00025	4.0	<0.000050	1.93	872	<0.0010	<0.000050	<0.00050	<0.00050	<0.0015	<0.00050	0.000099	<0.0025	0.0204	<0.0010
	10-Jun-2022	0.0057	<0.00050	0.0006	0.0215	<0.00010	<0.000250	0.261	<0.000025	<0.000050	<0.0025	0.0005	0.00102	<0.15	<0.00025	0.305	**0.186**	<0.0000050	0.000528	<0.0025	<0.25	0.00714	<0.00025	4.6	<0.000050	2.06	904	<0.0010	<0.000050	<0.00050	<0.00050	<0.0015	<0.00050	0.00013	<0.0025	<0.005	<0.0015
	15-Jun-2023	0.0069	<0.00050	0.00067	0.0155	<0.000100	<0.000250	0.252	<0.000025	<0.000050	<0.00050	0.00058	<0.00100	<0.050	<0.00025	0.32	**0.195**	<0.0000050	0.000525	<0.00250	<0.250	0.0095	<0.00250	4.56	<0.000050	2.17	993	<0.00100	<0.000050	<0.00050	<0.00050	<0.00150	<0.00050	0.000086	<0.00250	<0.050	<0.00100
MW8B	30-May-2014	-	<0.00068	-	<0.10	-	-	-	<0.000050	-	<0.010	-	0.0031	*<0.60*	<0.0020	-	-	<0.0000050	-	0.006	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.030	-
	28-May-2015	<0.030	<0.00069	0.0021	<0.10	-	-	0.41	<0.00020	-	<0.010	-	<0.0020	*<0.60*	<0.0020	-	**0.18**	<0.0000050	-	<0.0050	-	-	<0.0020	-	<0.00010	-	-	-	-	-	-	-	-	0.0022	-	<0.030	-
	8-Jun-2016	0.0050	<0.00070	0.0015	0.013	-	-	0.41	0.00003	-	<0.0010	-	0.00034	<0.060	<0.00020	-	**0.18**	<0.0000020	-	0.0035	-	-	<0.00020	-	<0.00010	-	-	-	-	-	-	-	-	0.0024	-	<0.0030	-
	7-Jun-2017	**0.060**	<0.00071	0.0013	<0.10	-	-	0.40	<0.000020	-	<0.0010	-	0.00039	*<0.60*	<0.00020	-	**0.180**	<0.0000020	-	0.0027	-	-	0.00025	-	<0.00010	-	-	-	-	-	-	-	-	0.0022	-	<0.0030	-
	26-Jun-2018	0.0045	<0.00072	0.0012	<0.10	-	-	0.41	0.000021	-	<0.0010	-	0.001	*<0.60*	<0.00020	-	**0.15**	0.0000041	-	0.0029	-	-	<0.00020	-	<0.00010	-	-	-	-	-	-	-	-	0.0018	-	<0.0030	-
	12-Jun-2019	0.0047	<0.00060	0.0014	<1.0	<0.0010	-	0.48	<0.000020	-	<0.0010	0.00077	0.00087	*<0.60*	<0.00020	<2.0	**0.13**	<0.0000020	0.0014	0.0027	<10	-	<0.00020	<10	<0.00010	<2.0	1200	-	<0.00020	-	<0.0010	<0.0010	-	0.0022	<0.0010	<0.0030	-
	29-May-2020	<0.0030	<0.00060	0.0011	0.01	<0.001	-	0.35	<0.000020	-	<0.0010	0.00079	0.00063	0.057	<0.00020	0.27	**0.13**	<0.0000020	0.0013	<0.0050	<0.1	-	<0.00020	3.9	<0.00010	1.7	1200	-	<0.0002	-	<0.001	<0.001	-	0.0025	<0.001	<0.0030	-
	4-Jun-2021	0.0102	<0.00050	0.00153	0.0119	<0.00050	<0.00025	0.425	<0.000025	0.000057	<0.00050	0.00093	0.0011	<0.050	<0.00025	0.286	**0.119**	<0.0000050	0.00147	0.0045	<0.25	0.0063	<0.00025	4.28	<0.000050	1.56	1130	<0.0010	<0.000050	<0.00050	<0.00050	<0.0015	<0.00050	0.00293	<0.0025	0.0182	0.0014
	10-Jun-2022	0.0055	<0.00050	0.00156	0.013	<0.00010	<0.00025	0.39	<0.000025	0.000077	<0.0025	0.0008	0.00357	<0.15	<0.00025	0.28	**0.128**	-	0.00152	0.00464	<0.25	0.00661	<0.00025	4.88	<0.000050	1.58	1120	<0.0010	<0.000050	<0.00050	<0.00050	<0.0015	<0.00050	0.00291	<0.0025	<0.0050	<0.0015
	15-Jun-2023	0.0741	<0.00100	0.0168	0.012	<0.000200	<0.000500	0.446	<0.000050	<0.000100	<0.00100	<0.00100	<0.00200	0.163	<0.000500	0.29	**0.12**	<0.0000050	0.00176	<0.0050	<0.500	0.00629	<0.000500	4.96	<0.000100	1.61	1.100	<0.00200	<0.000100	<0.00100	<0.00100	<0.00300	<0.00100	0.00386	<0.00500	<0.0100	<0.00200
MW11	30-May-2014	-	<0.00073	-	<0.10	-	-	-	<0.000050	-	<0.010	-	0.0024	*<0.60*	<0.0020	-	-	<0.0000050	-	0.006	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.030	-
	28-May-2015	<0.030	<0.00074	<0.0020	<0.010	-	-	0.19	<0.00020	-	<0.010	-	<0.0020	<0.060	<0.0020	-	0.015	<0.0000050	-	0.0058	-	-	<0.0020	-	*<0.0010*	-	-	-	-	-	-	-	-	**0.024**	-	<0.030	-
	8-Jun-2016	0.0060	<0.00075	0.0011	<0.010	-	-	0.20	0.000024	-	0.0011	-	0.0025	<0.060	<0.00020	-	0.0081	0.0000022	-	0.0060	-	-	0.0011	-	<0.00010	-	-	-	-	-	-	-	-	**0.030**	-	0.0077	-
	7-Jun-2017	<0.0030	<0.00076	0.0011	<0.10	-	-	<0.20	0.000029	-	<0.0010	-	0.0025	*<0.60*	<0.00020	-	<0.040	<0.0000020	-	0.0055	-	-	0.00079	-	<0.00010	-	-	-	-	-	-	-	-	**0.030**	-	0.0044	-
	26-Jun-2018	0.0055	<0.00077	0.0011	<0.10	-	-	0.21	<0.000020	-	0.0011	-	0.0026	*<0.60*	<0.00020	-	<0.040	<0.0000020	-	0.0056	-	-	0.00095	-	<0.00010	-	-	-	-	-	-	-	-	**0.030**	-	<0.0030	-
	12-Jun-2019	0.012	<0.00060	0.00085	<1.0	<0.0010	-	0.25	<0.000020	-	<0.0010	<0.00030	0.0023	*<0.60*	<0.00020	<2.0	<0.040	<0.0000020	0.00099	0.0042	<10	-	0.00044	<10	<0.00010	3.4	1500	-	<0.00020	-	<0.0010	<0.0010	-	**0.020**	<0.0010	0.0046	-
	29-May-2020	<0.0030	<0.00060	0.0011	<0.010	<0.001	-	0.2	<0.000020	-	<0.0010	<0.00030	0.002	<0.060	<0.00020	0.39	**0.015**	<0.0000019	0.00099	0.005	<0.1	-	0.00027	5.3	<0.00010	3.4	1700	-	<0.0002	-	<0.001	<0.001	-	**0.031**	<0.001	0.0034	-
	4-Jun-2021	<0.0050	<0.00050	0.00108	0.0062	<0.00050	<0.00025	0.202	<0.000025	0.000082	<0.00050	<0.00050	0.0017	<0.050	<0.00025	0.558	**0.0115**	<0.0000050	0.00114	0.0053	<0.25	0.0106	0.00053	4.71	<0.000050	3.6	1630	<0.0010	<0.000050	<0.00050	<0.00050	<0.0015	<0.00050	**0.026**	<0.0025	0.0198	<0.0010
	9-Jun-2022	0.0084	<0.00050	0.0006	0.00847	<0.00010	<0.00025	0.172	0.0000318	0.000094	<0.0025	<0.00050	0.00372	<0.15	<0.00025	0.515	**<0.025**	-	0.00105	0.00559	<0.25	0.0122	0.000675	5.31	<0.000050	3.65	1680	<0.0010	<0.000050	<0.00050	<0.00050	<0.0015	<0.00050	**0.031**	<0.0025	<0.0050	<0.0015
	15-Jun-2023	0.0101	<0.00100	0.00195	0.0116	<0.000200	<0.000500	0.364	<0.000050	0.000165	<0.00100	<0.00100	0.00315	<0.100	<0.000500	1.01	0.0268	<0.0000050	0.00199	0.00987	<0.500	0.023	0.00063	9.32	<0.000100	6.86	3.030	<0.00200	<0.000100	<0.00100	<0.00100	<0.00300	<0.00100	**0.0445**	<0.00500	0.0102	<0.00200
MW23B	30-May-2014	-	<0.00068	-	<0.10	-	-	-	0.00005	-	<0.010	-	<0.0020	*<0.60*	<0.0020	-	-	<0.0000050	-	<0.0050	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.030	-
	28-May-2015	<0.030	<0.00069	<0.0020	<0.10	-	-	0.35	<0.00020	-	<0.010	-	<0.0020	*<0.60*	<0.0020	-	**0.14**	<0.0000050	-	<0.0050	-	-	<0.0020	-	*<0.0010*	-	-	-	-	-	-	-	-	0.0023	-	<0.030	-
	8-Jun-2016	0.0081	<0.00070	0.00024	<0.10	-	-	0.40	0.00028	-	<0.0010	-	0.0013	*<0.60*	<0.00020	-	**0.065**	<0.0000020	-	0.0028	-	-	<0.00020	-	<0.00010	-	-	-	-	-	-	-	-	0.0020	-	0.0039	-
	7-Jun-2017	<0.0030	<0.00071	0.0003	<0.10	-	-	0.36	0.000047	-	<0.0010	-	<0.00020	*<0.60*	<0.00020	-	**0.12**	<0.0000020	-	0.0012	-	-	<0.00020	-	<0.00010	-	-	-	-	-	-	-	-	0.0035	-	<0.0030	-
	26-Jun-2018	<0.003	<0.00072	0.00022	<0.10	-	-	0.35	0.000035	-	<0.0010	-	0.0003	*<0.60*	<0.0002	-	**0.12**	<0.0000020	-	0.0013	-	-	<0.00020	-	<0.00010	-	-	-	-	-	-	-	-	0.0032	-	<0.0030	-
	17-Jun-2019	<0.0030	<0.00060	0.00023	<0.10	<0.0010	-	0.32	0.000094	-	<0.0010	0.0004	0.0008	*<0.60*	<0.00020	0.79	**0.11**	<0.0000020	0.00031	0.0019	<1.0	-	<0.00020	5.1	<0.00010	4	1500	-	<0.00020	-	<0.0010	<0.0010	-	0.0029	<0.0010	<0.0030	-
	5-Jun-2020	<0.0030	<0.00060	0.00033	<0.010	<0.001	-	0.33	0.000078	-	<0.0010	0.00041	0.00021	<0.060	<0.00020	0.86	**0.14**	<0.0000019	0.00038	0.011	<0.1	-	<0.00020	5.5	<0.00010	3.4	1700	-	<0.0002	-	<0.001	<0.001	-	0.0025	<0.001	<0.0030	-
	3-Jun-2021	<0.010	<0.00010	<0.0010	0.0064	<0.0010	<0.00050	0.35	0.000125	0.00015	<0.0010	<0.0010	<0.0020	<0.10	<0.00050	0.934	**0.126**	<0.0000050	<0.00050	<0.0050	<0.50	0.0171	<0.00050	5.67	<0.00010	4.3	1940	<0.0020	<0.00010	<0.0010	<0.0010	<0.0030	<0.0010	0.00302	<0.0050	0.02	<0.0020
	10-Jun-2022	0.0156	<0.00050	<0.00050	0.00765	<0.00010	<0.00025	0.388	0.0000371	0.000129	<0.0025	<0.00050	<0.0010	<0.15	<0.00025	0.905	**0.121**	-	0.000276	0.00265	<0.25	0.0172	<0.00025	5.71	<0.000050	3.8	1800	<0.0010	<0.000050	<0.00050	<0.00050	<0.0015	<0.00050	0.00228	<0.0025	<0.0050	<0.0015
	16-Jun-2023	<0.0100	<0.00100	<0.00100	0.00606	<0.000200	<0.000500	0.463	0.0000642	0.000152	<0.00100	<0.00100	<0.00200	0.1	<0.000500	0.89	**0.132**	<0.0000050	<0.000500	<0.00500	<0.500	0.0182	<0.000500	5.85	<0.000100	4.14	1.880	<0.00200	<0.000100	<0.00100	<0.00100	<0.00300	<0.00100	0.00201	<0.00500	<0.0100	<0.00200
MW25B	30-May-2014	-	<0.00073	-	<0.10	-	-	-	0.00021	-	<0.010	-	<0.0020	*<0.60*	<0.0020	-	-	<0.0000050	-	<0.0050	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.030	-
	28-May-2015	<0.030	<0.00074	<0.0020	<0.10	-	-	0.46	<0.00020	-	<0.010	-	<0.0020	*<0.60*	<0.0020	-	**0.17**	<0.0000050	-	<0.0050	-	-	<0.0020	-	*<0.0010*	-	-	-	-	-	-	-	-	<0.0010	-	<0.030	-
	8-Jun-2016	0.0084	<0.00075	0.00055	0.011	-	-	0.46	<0.000020	-	0.0016	-	0.00081	<0.060	<0.00020	-	**0.18**	<0.0000020	-	0.0031	-	-	<0.00020	-	<0.00010	-	-	-	-	-	-	-	-	0.00033	-	<0.0030	-
	7-Jun-2017	0.0053	<0.00076	0.00047	<0.10	-	-	0.47	<0.00002	-	<0.0010	-	0.00041	*<0.60*	<0.00020	-	**0.21**	<0.0000020	-	0.0028	-	-	<0.00020	-	<0.00010	-	-	-	-	-	-	-	-	0.0028	-	<0.0030	-
	26-Jun-2018	<0.003	<0.00077	0.00041	<0.10	-	-	0.48	<0.00002	-	<0.0010	-	0.00096	*<0.60*	<0.0002	-	**0.18**	<0.0000020	-	0.0025	-	-	<0.00020	-	<0.00010	-	-	-	-	-	-	-	-	0.00027	-	<0.0030	-
	17-Jun-2019	<0.0030	<0.00060	0.00039	<0.10	<0.0010	-	0.5	0.000026	-	<0.0010	0.00062	0.0016	*<0.60*	<0.00020	0.73	**0.19**	<0.0000020	0.001	0.0042	<1.0	-	<0.00020	4.6	<0.00010	4.6	1600	-	<0.00020	-	<0.0010	<0.0010	-	0.0029	<0.0010	0.0036	-
	5-Jun-2020	<0.0030	<0.00060	0.00038	0.017	<0.001	-	0.44	<0.000020	-	<0.0010	0.00043	0.0019	0.11	<0.00020	0.71	**0.19**	<0.0000019	0.0007	0.0026	<0.1	-	<0.00020	4.3	<0.00010	3.4	1600	-	<0.0002	-	<0.001	<0.001	-	0.0023	<0.001	<0.0030	-
	3-Jun-2021	<0.010	<0.00010	<0.0010	0.011	<0.0010	<0.00050	0.48	<0.000050	<0.00010	<0.0010	<0.0010	<0.0020	<0.10	<0.00050	0.739	**0.184**	<0.0000050	0.0006	<0.0050	<0.50	0.014	<0.00050	4.79	<0.00010	4.21	1770	<0.0020	<0.00010	<0.0010	<0.0010	<0.003	<0.0010	0.00024	<0.0050	0.02	<0.0020
	10-Jun-2022	0.0112	<0.00050	0.00063	0.0109	<0.00010	<0.00025	0.44	0.0000254	0.000102	<0.0025	0.00064	0.0012	<0.15	<0.00025	0.677	**0.17**	-	0.0008	0.00379	<0.25	0.0146	<0.00025	4.63	<0.000050	4.03	1680	<0.0010	<0.000050	0.00065	<0.00050	<0.0015	<0.00050	0.000271	<0.0025	<0.0050	<0.0015
	16-Jun-2023	<0.0100	<0.00100	<0.00100	0.0119	<0.000200	<0.000500	0.571	<0.0000500	<0.000100	<0.00100	<0.00100	<0.00200	<0.100	<0.000500	0.722	**0.193**	<0.0000050	0.00104	<0.00500	<0.500	0.0149	<0.000500	4.6	<0.000100	4.46	1.780	<0.00200	<0.000100	<0.00100	<0.00100	<0.00300	<0.00100	0.000296	<0.00500	<0.0100	<0.00200

Notes:
[1] Alberta Environment and Parks (AEP). 2022. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. ISBN 978-1-4601-5501-1. Referenced guidelines are for fine textured soils under Agricultural land use
[2] Alberta Environment and Parks (AEP). Environmental Quality Guidelines for Alberta Surface Waters. March 2018. Table 1 Surface water quality guidelines for the protection of freshwater aquatic life (PAL). Most conservative values applied (chronic or acute).
[3] Guideline varies with hardness.
[4] Guideline varies with pH and temperature.
[5] Guideline varies with chloride.
[6] Guideline varies with pH.
"-" No applicable guideline or not analyzed.
BOLD - Greater than Tier 1 Guideline.
Italic - Detection limit greater than Tier 1 guideline.
* - laboratory filtered.

TETRA TECH

Table 4b: Field and Groundwater Analytical Results Summary - Upper Sandstone Wells

	Parameter Group	Dissolved Metals																																				
	Parameter	Aluminum	Antimony	Arsenic	Barium	Beryllium	Bismuth	Boron	Cadmium	Cesium	Chromium	Cobalt	Copper	Iron	Lead	Lithium	Manganese	Mercury	Molybdenum	Nickel	Phosphorus	Rubidium	Selenium	Silicon	Silver	Strontium	Sulphur	Tellurium	Thallium	Thorium	Tin	Titanium	Tungsten	Uranium	Vanadium	Zinc	Zirconium
	Unit	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		0.007-0.05	0.006	0.005	1	-	-	1.0	0.00004-0.00037	-	0.05	-	0.007	0.3	0.001-0.007	-	0.05	0.000005	-	0.007-0.17	-	-	0.002	-	0.0001	-	-	-	-	-	-	-	-	0.01	-	0.03	-
Monitoring Well	Date																																					
MW26B	30-May-2014	-	<0.00078	-	0.010	-	-	-	<0.000050	-	<0.010	-	<0.0020	<0.060	<0.0020	-	-	<0.0000050	-	<0.0050	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.030	-
	28-May-2015	<0.030	<0.00079	<0.0020	<0.10	-	-	0.30	<0.00020	-	<0.010	-	<0.0020	*<0.60*	<0.0020	-	**0.20**	<0.0000050	-	<0.0050	-	-	<0.0020	-	*<0.0010*	-	-	-	-	-	-	-	-	0.0010	-	<0.030	-
	8-Jun-2016	0.0095	<0.00080	0.00081	0.010	-	-	0.32	<0.000020	-	0.0017	-	0.0014	<0.060	<0.00020	-	**0.20**	0.0000040	-	0.0029	-	-	<0.00020	-	<0.00010	-	-	-	-	-	-	-	-	0.0012	-	0.0084	-
	7-Jun-2017	0.0072	<0.00081	0.00077	<0.10	-	-	0.29	<0.00002	-	<0.0010	-	0.00039	*<0.60*	<0.0002	-	**0.22**	<0.0000020	-	0.0013	-	-	<0.0002	-	<0.0001	-	-	-	-	-	-	-	-	0.00082	-	<0.0030	-
	26-Jun-2018	<0.003	<0.00082	0.00056	<0.10	-	-	0.3	<0.00002	-	<0.0010	-	0.00071	*<0.60*	<0.0002	-	**0.20**	0.0000026	-	0.0019	-	-	0.00020	-	<0.00010	-	-	-	-	-	-	-	-	0.00094	-	<0.0030	-
	17-Jun-2019	<0.030	<0.00060	0.00052	<0.10	<0.0010	-	0.31	<0.000020	-	<0.0010	0.00071	0.00084	*<0.60*	<0.00020	0.41	**0.22**	<0.0000020	0.00094	0.0017	<1.0	-	<0.00020	4.5	<0.00010	2.5	1100	-	<0.00020	-	<0.0010	<0.0010	-	0.00095	<0.0010	<0.0030	-
	5-Jun-2020	<0.0030	<0.00060	0.00052	<0.010	<0.001	-	0.3	<0.000020	-	<0.0010	0.00059	0.00037	<0.060	<0.00020	0.42	**0.21**	<0.0000019	0.00068	0.0012	<0.1	-	<0.00020	4.6	<0.00010	2.1	1200	-	<0.0002	-	<0.001	<0.001	-	0.00086	<0.001	<0.0030	-
	3-Jun-2021	<0.010	<0.0010	<0.0010	0.0081	<0.0010	<0.00050	0.31	<0.000050	<0.00010	<0.0010	<0.0010	<0.0020	<0.10	<0.00050	0.445	**0.184**	<0.0000050	0.00095	<0.0050	<0.50	0.0085	<0.00050	4.56	<0.00010	2.4	1320	<0.0020	<0.00010	<0.0010	<0.0010	<0.0030	<0.0010	0.00095	<0.0050	0.019	<0.0020
	10-Jun-2022	0.0137	<0.00050	0.00052	0.00849	<0.00010	<0.00025	0.362	<0.000025	<0.000050	<0.0025	0.00071	0.00122	<0.15	<0.00025	0.426	**0.195**	-	0.000827	0.00296	<0.25	0.00896	0.000257	5.11	<0.000050	2.36	1280	<0.0010	<0.000050	<0.00050	<0.00050	<0.0015	<0.00050	0.00123	<0.0025	<0.0050	<0.0015
	16-Jun-2023	<0.0100	<0.00100	<0.00100	0.00996	<0.000200	<0.000500	0.434	<0.0000500	<0.000100	<0.00100	<0.00100	<0.00200	<0.100	<0.000500	0.477	**0.184**	<0.0000050	0.0016	<0.00500	<0.500	0.00866	<0.000500	5.13	<0.000100	2.64	1.300	<0.00200	<0.000100	<0.00100	<0.00100	<0.00300	<0.00100	0.00164	<0.00500	<0.0100	<0.00200
MW27B	30-May-2014	-	*<0.012*	-	<0.10	-	-	-	<0.0001	-	<0.020	-	<0.0040	*<0.60*	<0.0040	-	-	<0.0000050	-	<0.010	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*<0.060*	-
	28-May-2015	*<0.060*	*<0.012*	<0.0040	<0.10	-	-	0.42	*<0.00040*	-	<0.020	-	<0.0040	*<0.60*	<0.0040	-	**0.052**	<0.0000050	-	<0.010	-	-	*<0.0040*	-	*<0.0020*	-	-	-	-	-	-	-	-	0.0021	-	*<0.060*	-
	8-Jun-2016	0.0056	<0.00060	0.0020	<0.010	-	-	0.43	0.00004	-	0.0011	-	0.0010	<0.060	<0.00020	-	**0.052**	<0.0000020	-	0.0077	-	-	0.00039	-	<0.00010	-	-	-	-	-	-	-	-	0.0025	-	0.0048	-
	7-Jun-2017	0.01	<0.00060	0.0019	<0.10	-	-	0.46	0.000022	-	<0.0010	-	<0.00020	*<0.60*	<0.00020	-	**0.062**	<0.0000020	-	0.0051	-	-	0.00020	-	<0.00010	-	-	-	-	-	-	-	-	0.0034	-	<0.0030	-
	26-Jun-2018	0.0031	<0.00060	0.0018	<0.10	-	-	0.45	0.000027	-	<0.0010	-	0.00067	*<0.60*	<0.00020	-	**0.053**	0.0000035	-	0.0050	-	-	0.00033	-	<0.00010	-	-	-	-	-	-	-	-	0.0021	-	<0.0030	-
	17-Jun-2019	0.0093	<0.00060	0.0017	<0.10	<0.0010	-	0.45	0.000026	-	<0.0010	0.0011	0.00051	*<0.60*	<0.00020	0.54	**0.051**	<0.0000020	0.0016	0.0048	<1.0	-	<0.00020	4.5	<0.00010	4.7	1800	-	<0.00020	-	<0.0010	<0.0010	-	0.0024	<0.0010	<0.0030	-
	4-Jun-2020	<0.0030	<0.00060	0.0017	<0.010	<0.001	-	0.39	0.000028	-	<0.0010	0.0012	0.00041	<0.060	<0.00020	0.53	**0.056**	<0.0000019	0.0016	0.0050	<0.1	-	<0.00020	4.4	<0.00010	3.7	2000	-	<0.0002	-	<0.001	0.0012	-	0.0023	0.0013	<0.0030	-
	2-Jun-2021	<0.010	<0.0010	0.0017	0.0091	<0.0010	<0.00050	0.39	<0.000050	<0.00010	<0.0010	0.0012	<0.0020	<0.10	<0.00050	0.545	0.0475	<0.000005	0.00144	<0.0050	<0.50	0.0091	<0.00050	4.58	<0.00010	4.34	2050	<0.0020	<0.00010	<0.0010	<0.0010	<0.0030	<0.0010	0.00209	<0.0050	0.023	0.004
	10-Jun-2022	0.0104	<0.0010	0.00189	0.00922	<0.00020	<0.00050	0.52	<0.000050	<0.00010	<0.0050	0.0012	<0.0020	<0.30	<0.00050	0.588	<0.050	-	0.00143	0.0064	<0.50	0.00968	<0.00050	4.88	<0.00010	4.02	1950	<0.0020	<0.00010	<0.0010	<0.0010	<0.0030	<0.0010	0.0027	<0.0050	<0.010	0.00373
	16-Jun-2023	<0.0200	<0.00200	<0.00200	0.00798	<0.000400	<0.00100	0.538	<0.000100	<0.000200	<0.00200	<0.00200	<0.00400	<0.200	<0.00100	0.564	0.0416	<0.0000050	<0.00100	<0.0100	<1.00	0.0105	<0.00100	4.88	<0.000200	4.14	1960	<0.00400	<0.000200	<0.00200	<0.00200	<0.00600	<0.00200	0.00213	<0.0100	<0.0200	<0.00400
	29-Oct-2023	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW28B	30-May-2014	-	*<0.012*	-	<0.10	-	-	-	<0.00010	-	<0.020	-	<0.0040	*<0.60*	<0.0040	-	-	<0.0000050	-	<0.010	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*<0.060*	-
	28-May-2015	<0.060	*<0.012*	<0.0040	<0.10	-	-	0.44	<0.00040	-	<0.020	-	<0.0040	*<0.60*	<0.0040	-	**0.27**	<0.0000050	-	<0.010	-	-	*<0.0040*	-	*<0.0020*	-	-	-	-	-	-	-	-	<0.0020	-	*<0.060*	-
	8-Jun-2016	0.011	<0.00060	0.00044	0.010	-	-	0.45	0.000034	-	0.0012	-	0.0015	<0.060	<0.00020	-	**0.25**	<0.0000020	-	0.0049	-	-	<0.00020	-	<0.00010	-	-	-	-	-	-	-	-	0.00062	-	0.0052	-
	7-Jun-2017	0.0039	<0.00060	0.0004	<0.10	-	-	0.44	0.000022	-	<0.0010	-	0.00033	*<0.60*	<0.00020	-	**0.25**	<0.0000020	-	0.0038	-	-	<0.00020	-	<0.0001	-	-	-	-	-	-	-	-	0.00054	-	<0.0030	-
	26-Jun-2018	<0.003	<0.00060	0.00038	<0.10	-	-	0.44	0.000024	-	<0.0010	-	0.00064	*<0.60*	<0.00020	-	**0.25**	0.0000022	-	0.0034	-	-	<0.00020	-	<0.0001	-	-	-	-	-	-	-	-	0.00047	-	<0.0030	-
	17-Jun-2019	<0.0030	<0.00060	0.0003	<0.10	<0.0010	-	0.52	0.000027	-	<0.0010	0.0013	0.00014	<0.060	<0.00020	0.7	**0.25**	<0.0000020	0.00054	0.0032	<1.0	-	<0.00020	5.4	<0.00010	6.4	2500	-	<0.00020	-	<0.0010	<0.0010	-	0.00045	<0.0010	<0.0030	-
	4-Jun-2020	<0.0030	<0.00060	0.00026	0.014	<0.001	-	0.39	<0.000020	-	<0.0010	0.0014	0.0013	<0.060	<0.00020	0.65	**0.31**	<0.0000019	0.00059	0.0032	<0.1	-	<0.00020	4.8	<0.00010	4.7	2500	-	<0.0002	-	<0.001	<0.001	-	0.00056	<0.001	<0.0030	-
	2-Jun-2021	<0.010	<0.0010	<0.0010	0.0092	<0.0010	<0.00050	0.46	<0.000050	0.00011	<0.0010	0.0011	<0.0020	<0.10	<0.00050	0.69	**0.24**	<0.000005	0.0006	<0.0050	<0.50	0.0143	<0.00050	4.9	<0.00010	5.53	2580	<0.0020	<0.00010	<0.0010	<0.0010	<0.0030	<0.0010	0.00048	<0.0050	0.019	<0.0020
	10-Jun-2022	<0.010	<0.0010	<0.0010	<0.00829	<0.00020	<0.00050	0.451	<0.000050	0.000104	<0.0050	0.00119	<0.0020	<0.30	<0.00050	0.66	**0.234**	<0.0000050	0.00068	<0.0050	<0.50	0.0138	<0.00050	4.99	<0.00010	5.44	2460	<0.0020	<0.00010	<0.0010	<0.0010	<0.0030	<0.0010	0.00474	<0.0050	<0.010	<0.0030
	16-Jun-2023	<0.0200	<0.00200	<0.00200	0.0103	<0.000400	<0.00100	0.489	<0.000100	<0.000200	<0.00200	<0.00200	<0.00400	<0.200	<0.00100	0.697	**0.258**	<0.0000050	<0.00100	<0.0100	<1.00	0.0152	<0.00100	4.77	<0.000200	6.22	2,330	<0.00400	<0.000200	<0.00200	<0.00200	<0.00600	<0.00200	0.00029	<0.0100	<0.0200	<0.00400
MW29A	4-Jun-2015	0.0048	0.0012	0.0030	0.021	-	-	0.50	<0.000020	-	<0.0010	-	0.0012	<0.060	<0.00020	-	**0.081**	<0.0000050	-	0.0036	-	-	0.00039	-	<0.00010	-	-	-	-	-	-	-	-	0.0093	-	<0.0030	-
	8-Jun-2016	0.0067	<0.00060	0.0011	0.015	-	-	0.75	<0.000020	-	<0.0010	-	0.0020	<0.060	<0.00020	-	**0.064**	<0.0000020	-	0.0022	-	-	0.00022	-	<0.00010	-	-	-	-	-	-	-	-	0.0006	-	<0.0030	-
	7-Jun-2017	0.0079	**0.23**	0.00093	0.018	-	-	0.74	<0.000020	-	<0.0010	-	0.00093	<0.060	<0.00020	-	**0.06**	<0.000002	-	0.0014	-	-	0.00027	-	<0.00010	-	-	-	-	-	-	-	-	0.00055	-	<0.0030	-
	26-Jun-2018	0.0042	<0.0006	0.00076	0.014	-	-	0.72	<0.000020	-	<0.0010	-	0.00098	<0.060	<0.00020	-	**0.051**	0.0000028	-	0.0011	-	-	0.00023	-	<0.00010	-	-	-	-	-	-	-	-	0.00043	-	<0.0030	-
	17-Jun-2019	0.012	<0.00060	0.00072	0.014	<0.0010	-	0.72	<0.000020	-	<0.0010	0.00034	0.0031	<0.060	<0.00020	0.21	**0.05**	<0.0000020	0.0015	0.0013	<0.10	-	<0.00020	3.8	<0.00010	0.66	360	-	<0.00020	-	<0.0010	<0.0010	-	0.00047	<0.0010	0.0032	-
	4-Jun-2020	0.0057	<0.00060	0.00071	0.014	<0.001	-	0.71	<0.000020	-	<0.0010	<0.00030	0.0049	<0.060	<0.00020	0.23	**0.059**	<0.0000019	0.0018	0.0013	<0.1	-	<0.00020	3.8	<0.00010	0.7	420	-	<0.0002	-	<0.001	<0.001	-	0.00068	<0.001	<0.0030	-
	2-Jun-2021	0.0086	<0.00050	0.00065	0.0139	<0.00050	<0.00025	0.735	<0.000025	<0.000050	<0.00050	<0.00050	<0.0010	<0.050	<0.00025	0.231	**0.057**	<0.000005	0.00125	<0.0025	<0.25	0.0066	<0.00025	3.65	<0.000050	0.741	438	<0.0010	<0.000050	<0.00050	<0.00050	<0.0015	<0.00050	0.000593	<0.0025	0.02	<0.0010
	10-Jun-2022	0.0303	<0.0002	0.0007	0.0134	<0.00004	<0.0001	0.653	<0.00001	0.00004	<0.001	0.0003	0.00134	<0.06	<0.0001	0.25	**0.058**	-	0.00169	0.0024	<0.1	0.00704	0.000107	4.02	<0.00002	0.84	465	<0.0004	<0.00002	<0.0002	<0.0002	0.00109	<0.0002	0.000981	<0.001	<0.002	<0.0006
	16-Jun-2023	0.0058	<0.00050	0.00066	0.0129	<0.000100	<0.000250	0.686	<0.000020	<0.000050	<0.00050	<0.00050	<0.00100	<0.050	<0.00025	0.244	**0.0549**	<0.0000050	0.00154	<0.00250	<0.250	0.0076	<0.000250	3.79	<0.000050	0.869	432	<0.00100	<0.000050	<0.00050	<0.00050	<0.00150	<0.00050	0.000614	<0.00250	<0.0050	<0.00100
MW30A	4-Jun-2015	**1.0**	0.00080	0.0037	0.028	-	-	0.43	0.000040	-	0.0016	-	0.0056	**0.44**	0.00077	-	**0.081**	<0.0000050	-	0.013	-	-	0.0012	-	<0.00010	-	-	-	-	-	-	-	-	0.0063	-	0.0034	-
	8-Jun-2016	**3.8**	<0.00060	0.0030	0.025	-	-	0.52	0.000026	-	0.0045	-	**0.0075**	**0.63**	0.00054	-	**0.059**	<0.0000020	-	0.010	-	-	0.00064	-	<0.00010	-	-	-	-	-	-	-	-	0.0035	-	0.0037	-
	7-Jun-2017	0.011	<0.00060	0.00089	0.015	-	-	0.40	<0.000020	-	<0.0010	-	0.00034	<0.06	<0.00020	-	0.018	<0.0000020	-	0.0023	-	-	<0.00020	-	<0.00010	-	-	-	-	-	-	-	-	0.00018	-	<0.0030	-
	26-Jun-2018	0.0059	<0.00060	0.00077	0.013	-	-	0.38	<0.000020	-	<0.0010	-	0.00057	<0.06	<0.00020	-	0.016	0.0000025	-	0.00065	-	-	<0.00020	-	<0.00010	-	-	-	-	-	-	-	-	0.00017	-	<0.0030	-
	17-Jun-2019	<0.0030	<0.00060	0.00059	0.011	<0.0010	-	0.39	<0.000020	-	<0.0010	<0.00030	0.00065	<0.060	<0.00020	0.14	0.015	<0.0000020	0.0008	0.00074	<0.10	-	<0.00020	3.9	<0.00010	0.15	120	-	<0.00020	-	<0.0010	<0.0010	-	0.00011	<0.0010	<0.0030	-
	29-May-2020	<0.0030	<0.00060	0.00066	0.012	<0.001	-	0.37	<0.000020	-	<0.0010	<0.00030	0.0005	<0.060	<0.00020	0.14	0.015	<0.0000019	0.00081	<0.00050	<0.1	-	<0.00020	3.5	<0.00010	0.14	120	-	<0.0002	-	<0.001	<0.001	-	<0.00010	<0.001	<0.0030	-
	2-Jun-2021	0.005	<0.0010	0.0008	0.0133	<0.00010	<0.000050	0.236	0.0000089	0.000018	<0.0010	0.00018	0.00166	0.061	<0.00050	0.138	0.0184	<0.000005	0.00073	0.00066	0.098	0.00329	0.00012	3.93	<0.00010	0.123	138	<0.00020	<0.00010	<0.00010	<0.00010	<0.0030	<0.00010	0.000106	<0.00050	0.0196	<0.00020
	10-Jun-2022	0.0061	<0.00010	0.00093	0.0125	<0.000020	<0.000050	0.348	<0.0000050	0.00002	<0.00050	0.0002	0.00132	<0.030	<0.000050	0.165	0.0162	-	0.00086	0.0018	0.089	0.00322	0.000115	3.98	0.000018	0.146	130	<0.00020	0.000011	<0.00010	<0.00010	<0.00030	0.00022	0.000106	<0.00050	<0.0010	<0.00030
	15-Jun-2023	0.0092	<0.00050	0.00078	0.0123	<0.000100	<0.000250	0.409	<0.0000250	<0.000050	<0.00050	<0.00050	<0.00100	<0.050	<0.000250	0.163	0.0184	<0.0000050	0.00128	<0.00250	<0.250	0.003	<0.000250	3.92	<0.000050	0.168	135	<0.00100	<0.000050	<0.00050	<0.00050	<0.00150	<0.00050	0.000093	<0.00250	<0.0050	<0.00100
MW31A	4-Jun-2015	**1.5**	0.0013	**0.0069**	0.097	-	-	0.58	0.000048	-	0.0017	-	**0.0093**	**9.0**	**0.0021**	-	**0.068**	**0.000008**	-	0.020	-	-	0.0013	-	<0.00010	-	-	-	-	-	-	-	-	0.0095	-	0.0051	-
	8-Jun-2016	**0.31**	<0.00060	0.00088	<0.10	-	-	0.66	<0.000020	-	<0.0010	-	0.00093	*<0.60*	0.00043	-	<0.040	**0.000043**	-	0.0026	-	-	<0.00020	-	<0.00010	-	-	-	-	-	-	-	-	0.00054	-	<0.0030	-
	7-Jun-2017	**0.55** *	0.00077 *	0.0042 *	0.085 *	-	-	0.74 *	0.000025 *	-	<0.0010 *	-	0.0046 *	0.18 *	0.00043 *	-	0.036 *	<0.0000020 *	-	**0.012** *	-	-	0.00078 *	-	<0.00010 *	-	-	-	-	-	-	-	-	0.0041 *	-	<0.0030 *	-
	26-Jun-2018	**0.097**	0.00065	0.0035	0.05	-	-	0.76	<0.000020	-	<0.0010	-	0.0021	0.074	<0.0002	-	<0.004	**0.0000051**	-	0.0033	-	-	0.00051	-	<0.00010	-	-	-	-	-	-	-	-	0.0039	-	<0.0030	-
	17-Jun-2019	0.024	0.00073	**0.0051**	0.051	<0.0010	-	0.75	0.000026	-	<0.0010	0.0005	0.002	0.06	<0.00020	0.072	0.027	-	0.023	0.0056	0.12	-	0.00054	2.6	<0.00010	0.07	17	-	<0.00020	-	<0.0010	<0.0010	-	0.0032	<0.0010	<0.0030	-
	5-Jun-2020	**0.074**	<0.00060	0.0028	0.054	<0.001	-	0.8	<0.000020	-	<0.0010	0.00031	0.0010	<0.060	<0.00020	0.088	0.021	<0.0000019	0.011	0.0031	<0.1	-	0.00024	2.6	<0.00010	0.082	18	-	<0.0002	-	<0.001	0.0014	-	0.0029	<0.001	<0.0030	-
	3-Jun-2021	**0.0703**	0.00065	0.00336	0.0678	<0.00010	<0.000050	0.781	0.0000106	0.000027	<0.0001	0.00048	0.0027	0.035	0.000082	0.0868	0.0298	<0.0000050	0.01	0.0038	0.068	0.00277	0.000309	2.83	<0.000010	0.0833	14.9	<0.00020	<0.000010	<0.00010	0.00026	0.0012	<0.00010	0.00239	0.00071	0.0216	0.0019
	10-Jun-2022	**0.106**	0.00046	0.00331	0.0457	<0.000020	<0.000050	0.699	0.0000067	0.000014	<0.00050	0.00042	0.0018	0.047	0.000065	0.0937	0.0266	-	0.00778	0.00412	0.073	0.00271	0.000271	2.82	<0.000010	0.0764	14.7	<0.00020	0.000012	<0.00010	<0.00010	0.00149	<0.00010	0.0024	0.00054	<0.0010	0.0013
	16-Jun-2023	0.0056	0.0003	0.00312	0.0472	<0.000020	<0.000050	0.609	2.47E-05	0.000012	<0.00050	0.0007	0.00147	<0.010	<0.000050	0.0939	**0.0778**	<0.0000050	0.0105	0.00458	0.107	0.00268	0.000176	2.76	<0.000010	0.0805	12.7	<0.00020	0.000014	0.00016	<0.00010	<0.00030	<0.00010	0.00255	0.00061	<0.0010	0.00171

Notes:

[1] Alberta Environment and Parks (AEP). 2022. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. ISBN 978-1-4601-5501-1. Referenced guidelines are for fine textured soils under Agricultural land use

[2] Alberta Environment and Parks (AEP). Environmental Quality Guidelines for Alberta Surface Waters. March 2018. Table 1 Surface water quality guidelines for the protection of freshwater aquatic life (PAL). Most conservative values applied (chronic or acute).

[3] Guideline varies with hardness.

[4] Guideline varies with pH and temperature.

[5] Guideline varies with chloride.

[6] Guideline varies with pH.

"-" No applicable guideline or not analyzed.

BOLD - Greater than Tier 1 Guideline.

italic - Detection limit greater than Tier 1 guideline.

* - laboratory filtered.

TETRA TECH

Table 4b: Field and Groundwater Analytical Results Summary - Upper Sandstone Wells

Parameter Group		Dissolved Metals																																			
	Parameter	Aluminum	Antimony	Arsenic	Barium	Beryllium	Bismuth	Boron	Cadmium	Cesium	Chromium	Cobalt	Copper	Iron	Lead	Lithium	Manganese	Mercury	Molybdenum	Nickel	Phosphorus	Rubidium	Selenium	Silicon	Silver	Strontium	Sulphur	Tellurium	Thallium	Thorium	Tin	Titanium	Tungsten	Uranium	Vanadium	Zinc	Zirconium
	Unit	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		0.007-0.05	0.006	0.005	1	-	-	1.0	0.00004-0.00037	-	0.05	-	0.007	0.3	0.001-0.007	-	0.05	0.000005	-	0.007-0.17	-	-	0.002	-	0.0001	-	-	-	-	-	-	-	-	0.01	-	0.03	-
Monitoring Well	Date																																				
MW33A	28-May-2015	0.0044	0.00076	**0.0089**	0.070	-	-	0.50	<0.000020	-	<0.0010	-	0.0017	<0.060	<0.00020	-	**0.13**	<0.0000050	-	0.016	-	-	0.00058	-	<0.00010	-	-	-	-	-	-	-	-	0.0096	-	<0.0030	-
	8-Jun-2016	**0.66**	<0.00060	0.0042	0.080	-	-	0.71	<0.000020	-	<0.0010	-	**0.028**	**0.69**	0.00094	-	**0.058**	*<0.0000060*	-	0.0083	-	-	<0.00020	-	<0.00010	-	-	-	-	-	-	-	-	0.0035	-	<0.0030	-
	7-Jun-2017	0.005	<0.00060	0.0018	0.053	-	-	0.68	<0.000020	-	<0.0010	-	<0.00020	<0.060	<0.00020	-	0.027	<0.0000020	-	0.0022	-	-	<0.00020	-	<0.0001	-	-	-	-	-	-	-	-	0.0012	-	<0.0030	-
	26-Jun-2018	**0.22**	<0.00060	**0.0056**	0.11	-	-	0.82	<0.000020	-	<0.0010	-	0.0012	**1.2**	0.00073	-	**0.081**	**0.000016**	-	0.009	-	-	0.00028	-	<0.00010	-	-	-	-	-	-	-	-	0.0013	-	0.0040	-
	12-Jun-2019	**0.081**	<0.00060	0.0011	0.059	<0.0010	-	0.87	<0.000020	-	<0.0010	0.0003	0.00087	**0.34**	<0.00020	0.078	**0.037**	<0.0000020	0.021	0.00074	0.16	-	<0.00020	3.9	<0.00010	0.073	16	-	<0.00020	-	<0.0010	0.0015	-	0.00054	<0.0010	<0.0030	-
	4-Jun-2020	0.0083	<0.00060	0.00088	0.024	<0.001	-	0.75	<0.000020	-	<0.0010	0.00039	0.0019	<0.060	<0.00020	0.56	**0.069**	<0.0000019	0.0026	0.0027	<0.1	-	<0.00020	3.5	<0.00010	2.2	1200	-	<0.0002	-	<0.001	0.0019	-	0.00056	<0.001	<0.0030	-
	4-Jun-2021	0.0332	0.0003	0.00276	0.0862	<0.00010	<0.000050	0.636	0.0000051	0.000075	<0.00010	0.00053	0.00053	0.028	0.000085	0.0731	0.0249	<0.0000050	0.0205	0.00234	0.109	0.00359	0.000142	3.1	<0.00010	0.0789	17.3	<0.00020	<0.000010	<0.00010	0.00013	0.00072	0.00037	0.000829	0.00179	0.0197	0.0007
	10-Jun-2022	0.0016	<0.00010	0.00316	0.08	<0.000020	<0.000050	0.702	0.0000136	0.000021	<0.00050	0.00028	<0.00020	0.094	<0.000050	0.0874	0.0342	-	0.0267	0.00122	0.218	0.00247	0.000201	3.98	<0.000010	0.0841	11.2	<0.00020	<0.000010	<0.00010	0.00024	0.00033	0.0005	0.00127	0.00071	<0.0010	0.00133
	15-Jun-2023	0.0032	0.00013	0.00286	0.0842	<0.000020	<0.000050	0.604	0.000006	0.000019	<0.00050	0.00026	0.00024	0.065	<0.000050	0.076	0.0246	<0.0000050	0.0291	0.00122	0.227	0.00242	0.000155	3.82	<0.000010	0.0787	7.08	<0.00020	<0.000010	<0.00010	<0.00010	0.00038	0.00051	0.00096	0.00079	<0.0010	0.00132
15MW35B	8-Jun-2016	0.012	0.00069	0.0019	<0.10	-	-	0.70	<0.000020	-	<0.0010	-	0.0018	*<0.60*	<0.00020	-	**0.066**	<0.0000020	-	0.0041	-	-	0.00052	-	<0.00010	-	-	-	-	-	-	-	-	0.0023	-	<0.0030	-
	7-Jun-2017	0.0035	<0.00060	0.0014	<0.10	-	-	0.71	0.000022	-	<0.0010	-	0.0032	*<0.60*	<0.00020	-	**0.074**	<0.0000020	-	0.0036	-	-	0.00053	-	<0.00010	-	-	-	-	-	-	-	-	0.0015	-	<0.0030	-
	26-Jun-2018	0.0047	<0.00060	0.0011	<0.10	-	-	0.82	<0.000020	-	<0.0010	-	0.0016	*<0.60*	<0.00020	-	0.049	0.0000027	-	0.0028	-	-	0.00034	-	<0.00010	-	-	-	-	-	-	-	-	0.0010	-	<0.0030	-
	17-Jun-2019	0.0032	<0.00060	0.0011	<0.10	<0.0010	-	0.84	0.000065	-	<0.0010	0.00037	0.0026	*<0.60*	<0.00020	0.66	0.049	<0.0000020	0.0031	0.0033	<1.0	-	0.00049	3.5	<0.00010	2.5	1300	-	<0.00020	-	<0.0010	0.0011	-	0.0010	<0.0010	<0.0030	-
	5-Jun-2020	0.0032	<0.00060	0.0011	<0.10	<0.0010	-	0.84	0.000065	-	<0.0010	0.00037	0.0026	*<0.60*	<0.00020	0.66	0.049	<0.0000020	0.0031	0.0033	<1.0	-	0.00049	3.5	<0.00010	2.5	1300	-	<0.00020	-	<0.0010	0.0011	-	0.0010	<0.0010	<0.0030	-
	2-Jun-2021	0.0063	<0.00050	0.0008	0.0232	<0.00050	<0.00025	0.709	<0.000025	0.000094	<0.00050	<0.00050	0.0018	*<0.050*	<0.00025	0.56	**0.0641**	<0.000005	0.00211	<0.0025	<0.25	0.012	<0.00025	3.52	<0.000050	2.4	1350	<0.0010	<0.000050	<0.00050	<0.00050	<0.0015	<0.00050	0.0008	<0.0025	0.0196	<0.0010
	9-Jun-2022	0.0228	<0.00050	0.00074	0.0233	<0.00010	<0.00025	0.693	<0.000025	0.000103	<0.0025	<0.00050	0.00385	*<0.15*	<0.00025	0.546	**0.0814**	-	0.00199	0.00297	<0.25	0.012	<0.00025	3.54	<0.000050	2.27	1260	<0.0010	<0.000050	<0.00050	<0.00050	<0.0015	<0.00050	0.0009	<0.0025	<0.0050	<0.0015
	16-Jun-2023	0.0182	<0.00100	<0.00100	0.0259	<0.000200	<0.000500	0.8	<0.000500	<0.000100	<0.00100	<0.00100	<0.00200	<0.100	<0.000500	0.556	**0.0741**	<0.0000050	0.00235	<0.00500	<0.500	0.0133	<0.000500	3.31	<0.000100	2.46	1.160	<0.00200	<0.000100	<0.00100	<0.00100	<0.00300	<0.00100	0.000898	<0.00500	<0.0100	<0.00200

Notes:

[1] Alberta Environment and Parks (AEP). 2022. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. ISBN 978-1-4601-5501-1. Referenced guidelines are for fine textured soils under Agricultural land use

[2] Alberta Environment and Parks (AEP). Environmental Quality Guidelines for Alberta Surface Waters. March 2018. Table 1 Surface water quality guidelines for the protection of freshwater aquatic life (PAL). Most conservative values applied (chronic or acute).

[3] Guideline varies with hardness.

[4] Guideline varies with pH and temperature.

[5] Guideline varies with chloride.

[6] Guideline varies with pH.

"-" No applicable guideline or not analyzed.

BOLD - Greater than Tier 1 Guideline.

Italic - Detection limit greater than Tier 1 guideline.

* - laboratory filtered.

TETRA TECH

Table 4b: Field and Groundwater Analytical Results Summary - Upper Sandstone Wells

Parameter Group		Volatile Organic Compounds (VOCs)																																																						
Parameter		Bromobenzene	Bromochloromethane	n-Butylbenzene	sec-Butylbenzene	tert-Butylbenzene	Carbon tetrachloride	Chlorobenzene	Chloroethane	Chloroform	Chloromethane	2-Chlorotoluene	4-Chlorotoluene	Dibromochloromethane	1,2-Dibromo-3-chloropropane	1,2-Dibromoethane	Dibromomethane	1,2-Dichlorobenzene	1,3-Dichlorobenzene	1,4-Dichlorobenzene	1,1-Dichloroethane	1,2-Dichloroethane	1,1-Dichloroethene	1,2-Dichloroethene (cis)	1,2-Dichloroethene (trans)	Dichlorodifluoromethane	1,2-Dichloropropane	1,3-Dichloropropane	2,2-Dichloropropane	1,1-Dichloropropene	1,3-Dichloropropene [cis]	1,3-Dichloropropene [trans]	Hexachlorobutadiene	p-Isopropyltoluene	Methyl t-Butyl Ether (MTBE)	Methylene Chloride	Methyl Methacrylate	iso-Propylbenzene (cumene)	n-Propylbenzene	1,1,1,2-Tetrachloroethane	1,1,2,2-Tetrachloroethane	Tetrachloroethene	1,2,3-Trichlorobenzene	1,2,4-Trichlorobenzene	1,3,5-Trichlorobenzene	1,1,1-Trichloroethane	1,1,2-Trichloroethane	Trichloroethene	Trichlorofluoromethane	Trihalomethanes	1,2,3-Trichloropropane	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	Vinyl chloride
Unit		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		-	-	-	-	-	0.002	0.0013	-	0.08	-	-	-	0.1	-	-	-	0.0007	-	0.001	-	0.005	0.014	-	-	-	-	-	-	-	-	-	-	-	0.015	0.05	0.47	-	-	-	-	0.01	0.008	0.015	0.014	-	-	0.005	-	0.1	-	-	-	0.002
Monitoring Well	Date																																																						
MW1C	30-May-2014						-	-	-	-	-			-		-		-	-	-	-	-	-	-	-		-				-	-			-	-	-			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	28-May-2015						-	-	-	-	-			-		-		-	-	-	-	-	-	-	-		-				-	-			-	-	-			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	8-Jun-2016						-	-	-	-	-			-		-		-	-	-	-	-	-	-	-		-				-	-			-	-	-			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	7-Jun-2017						-	-	-	-	-			-		-		-	-	-	-	-	-	-	-		-				-	-			-	-	-			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	26-Jun-2018						-	-	-	-	-			-		-		-	-	-	-	-	-	-	-		-				-	-			-	<0.0020	-			-	-	<0.00050	-	-	-	-	-	-	<0.00050	-	-	-	-	<0.00050
	12-Jun-2019						<0.00050	<0.00050	<0.0010	<0.00050	<0.0020			<0.0010		<0.00020		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050		<0.00050				<0.00050	<0.00050			<0.00050	<0.0020	<0.00050			<0.0010	<0.0020	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0013		<0.00050	<0.00050	<0.00050
	5-Jun-2020						<0.00050	<0.00050	<0.0010	<0.00050	<0.0020			<0.0010		<0.00020		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050		<0.00050				<0.00050	<0.00050			<0.00050	<0.0020	<0.00050			<0.0010	<0.0020	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0013		<0.00050	<0.00050	<0.00050
	4-Jun-2021	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0020	<0.0010	<0.0010	<0.0010
	10-Jun-2022	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00020	<0.00050	<0.00050	<0.00050	<0.0020	<0.00050	<0.00050	<0.00050	<0.00050	<0.00020	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0010	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	-	<0.00050	<0.00050	<0.00050	<0.00050	-	<0.00050	<0.00050	<0.00050	<0.00050
	15-Jun-2023	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0015	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010	<0.0010
MW8B	30-May-2014						-	-	-	-	-			-		-		-	-	-	-	-	-	-	-		-				-	-			-	-	-			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	28-May-2015						-	-	-	-	-			-		-		-	-	-	-	-	-	-	-		-				-	-			-	-	-			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	8-Jun-2016						-	-	-	-	-			-		-		-	-	-	-	-	-	-	-		-				-	-			-	-	-			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	7-Jun-2017						-	-	-	-	-			-		-		-	-	-	-	-	-	-	-		-				-	-			-	-	-			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	26-Jun-2018						-	-	-	-	-			-		-		-	-	-	-	-	-	-	-		-				-	-			-	<0.0020	-			-	-	<0.00050	-	-	-	-	-	-	<0.00050	-	-	-	-	<0.00050
	12-Jun-2019						<0.00050	<0.00050	<0.0010	<0.00050	<0.0020			<0.0010		<0.00020		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050		<0.00050				<0.00050	<0.00050			<0.00050	<0.0020	<0.00050			<0.0010	<0.0020	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0013		<0.00050	<0.00050	<0.00050
	29-May-2020						<0.00050	<0.00050	<0.0010	<0.00050	<0.0020			<0.0010		<0.00020		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050		<0.00050				<0.00050	<0.00050			<0.00050	<0.0020	<0.00050			<0.0010	<0.0020	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0013		<0.00050	<0.00050	<0.00050
	4-Jun-2021	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0020	<0.0010	<0.0010	<0.0010
	10-Jun-2022	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00020	<0.00050	<0.00050	<0.00050	<0.0020	<0.00050	<0.00050	<0.00050	<0.00050	<0.00020	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0010	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	-	<0.00050	<0.00050	<0.00050	<0.00050	-	<0.00050	<0.00050	<0.00050	<0.00050
	15-Jun-2023	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0015	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010	<0.0010
MW11	30-May-2014						-	-	-	-	-			-		-		-	-	-	-	-	-	-	-		-				-	-			-	-	-			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	28-May-2015						-	-	-	-	-			-		-		-	-	-	-	-	-	-	-		-				-	-			-	-	-			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	8-Jun-2016						-	-	-	-	-			-		-		-	-	-	-	-	-	-	-		-				-	-			-	-	-			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	7-Jun-2017						-	-	-	-	-			-		-		-	-	-	-	-	-	-	-		-				-	-			-	-	-			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	26-Jun-2018						-	-	-	-	-			-		-		-	-	-	-	-	-	-	-		-				-	-			-	<0.0020	-			-	-	<0.00050	-	-	-	-	-	-	<0.00050	-	-	-	-	<0.00050
	12-Jun-2019						<0.00050	<0.00050	<0.0010	<0.00050	<0.0020			<0.0010		<0.00020		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050		<0.00050				<0.00050	<0.00050			<0.00050	<0.0020	<0.00050			<0.0010	<0.0020	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0013		<0.00050	<0.00050	<0.00050
	29-May-2020						<0.00050	<0.00050	<0.0010	<0.00050	<0.0020			<0.0010		<0.00020		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050		<0.00050				<0.00050	<0.00050			<0.00050	<0.0020	<0.00050			<0.0010	<0.0020	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0013		<0.00050	<0.00050	<0.00050
	4-Jun-2021	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0020	<0.0010	<0.0010	<0.0010
	10-Jun-2022	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00020	<0.00050	<0.00050	<0.00050	<0.0020	<0.00050	<0.00050	<0.00050	<0.00050	<0.00020	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0010	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	-	<0.00050	<0.00050	<0.00050	<0.00050	-	<0.00050	<0.00050	<0.00050	<0.00050
	16-Jun-2023	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0015	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010	<0.0010
MW23B	30-May-2014						-	-	-	-	-			-		-		-	-	-	-	-	-	-	-		-				-	-			-	-	-			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	28-May-2015						-	-	-	-	-			-		-		-	-	-	-	-	-	-	-		-				-	-			-	-	-			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	8-Jun-2016						-	-	-	-	-			-		-		-	-	-	-	-	-	-	-		-				-	-			-	-	-			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	7-Jun-2017						-	-	-	-	-			-		-		-	-	-	-	-	-	-	-		-				-	-			-	-	-			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	26-Jun-2018						-	-	-	-	-			-		-		-	-	-	-	-	-	-	-		-				-	-			-	<0.0020	-			-	-	<0.00050	-	-	-	-	-	-	<0.00050	-	-	-	-	<0.00050
	17-Jun-2019						<0.00050	<0.00050	<0.0010	<0.00050	<0.0020			<0.0010		<0.00020		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050		<0.00050				<0.00050	<0.00050			<0.00050	<0.0020	<0.00050			<0.0010	<0.0020	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0013		<0.00050	<0.00050	<0.00050
	5-Jun-2020						<0.00050	<0.00050	<0.0010	<0.00050	<0.0020			<0.0010		<0.00020		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050		<0.00050				<0.00050	<0.00050			<0.00050	<0.0020	<0.00050			<0.0010	<0.0020	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0013		<0.00050	<0.00050	<0.00050
	3-Jun-2021	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0020	<0.0010	<0.0010	<0.0010
	10-Jun-2022	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00020	<0.00050	<0.00050	<0.00050	<0.0020	<0.00050	<0.00050	<0.00050	<0.00050	<0.00020	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0010	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	-	<0.00050	<0.00050	<0.00050	<0.00050	-	<0.00050	<0.00050	<0.00050	<0.00050
	16-Jun-2023	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0015	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010	<0.0010
MW25B	30-May-2014						-	-	-	-	-			-		-		-	-	-	-	-	-	-	-		-				-	-			-	-	-			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	28-May-2015						-	-	-	-	-			-		-		-	-	-	-	-	-	-	-		-				-	-			-	-	-			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	8-Jun-2016						-	-	-	-	-			-		-		-	-	-	-	-	-	-	-		-				-	-			-	-	-			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	7-Jun-2017						-	-	-	-	-			-		-		-	-	-	-	-	-	-	-		-				-	-			-	-	-			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	26-Jun-2018						-	-	-	-	-			-		-		-	-	-	-	-	-	-	-		-				-	-			-	<0.0020	-			-	-	<0.00050	-	-	-	-	-	-	<0.00050	-	-	-	-	<0.00050
	17-Jun-2019						<0.00050	<0.00050	<0.0010	<0.00050	<0.0020			<0.0010		<0.00020		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050		<0.00050				<0.00050	<0.00050			<0.00050	<0.0020	<0.00050			<0.0010	<0.0020	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0013		<0.00050	<0.00050	<0.00050
	5-Jun-2020						<0.00050	<0.00050	<0.0010	<0.00050	<0.0020			<0.0010		<0.00020		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050		<0.00050				<0.00050	<0.00050			<0.00050	<0.0020	<0.00050			<0.0010	<0.0020	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0013		<0.00050	<0.00050	<0.00050
	3-Jun-2021	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0020	<0.0010	<0.0010	<0.0010
	10-Jun-2022	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00020	<0.00050	<0.00050	<0.00050	<0.0020	<0.00050	<0.00050	<0.00050	<0.00050	<0.00020	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0010	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	-	<0.00050	<0.00050	<0.00050	<0.00050	-	<0.00050	<0.00050	<0.00050	<0.00050
	16-Jun-2023	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0015	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010	<0.0010

Notes:
[1] Alberta Environment and Parks (AEP). 2022. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. ISBN 978-1-4601-5501-1. Referenced guidelines are for fine textured soils under Agricultural land use
[2] Alberta Environment and Parks (AEP). Environmental Quality Guidelines for Alberta Surface Waters. March 2018. Table 1 Surface water quality guidelines for the protection of freshwater aquatic life (PAL). Most conservative values applied (chronic or acute).
[3] Guideline varies with hardness.
[4] Guideline varies with pH and temperature.
[5] Guideline varies with chloride.
[6] Guideline varies with pH.
"-" No applicable guideline or not analyzed.
BOLD - Greater than Tier 1 Guideline.
italic - Detection limit greater than Tier 1 guideline.
* - laboratory filtered.

TETRA TECH

Table 4b: Field and Groundwater Analytical Results Summary - Upper Sandstone Wells

Monitoring Well	Date	Bromobenzene	Bromochloromethane	n-Butylbenzene	sec-Butylbenzene	tert-Butylbenzene	Carbon tetrachloride	Chlorobenzene	Chloroethane	Chloroform	Chloromethane	2-Chlorotoluene	4-Chlorotoluene	Dibromochloromethane	1,2-Dibromo-3-chloropropane	1,2-Dibromoethane	Dibromomethane	1,2-Dichlorobenzene	1,3-Dichlorobenzene
Parameter Group		Volatile Organic Compounds (VOCs)																	
Unit		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		-	-	-	-	-	0.002	0.0013	-	0.08	-	-	-	0.1	-	-	-	0.0007	-
MW26B	30-May-2014						-	-	-	-	-			-		-		-	-
	28-May-2015						-	-	-	-	-			-		-		-	-
	8-Jun-2016						-	-	-	-	-			-		-		-	-
	7-Jun-2017						-	-	-	-	-			-		-		-	-
	26-Jun-2018						-	-	-	-	-			-		-		-	-
	17-Jun-2019						<0.00050	<0.00050	<0.0010	<0.00050	<0.0020			<0.0010		<0.00020		<0.00050	<0.00050
	5-Jun-2020						<0.00050	<0.00050	<0.0010	<0.00050	<0.0020			<0.0010		<0.00020		<0.00050	<0.00050
	3-Jun-2021	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010
	10-Jun-2022	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00020	<0.00050	<0.00050	<0.00050	<0.0020	<0.00050	<0.00050	<0.00050	<0.00050	<0.00020	<0.00050	<0.00050	<0.00050
	16-Jun-2023	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010
MW27B	30-May-2014						-	-	-	-	-			-		-		-	-
	28-May-2015						-	-	-	-	-			-		-		-	-
	8-Jun-2016						-	-	-	-	-			-		-		-	-
	7-Jun-2017						-	-	-	-	-			-		-		-	-
	26-Jun-2018						-	-	-	-	-			-		-		-	-
	17-Jun-2019						<0.00050	<0.00050	<0.0010	<0.00050	<0.0020			<0.0010		<0.00020		<0.00050	<0.00050
	4-Jun-2020						<0.00050	<0.00050	<0.0010	<0.00050	<0.0020			<0.0010		<0.00020		<0.00050	<0.00050
	2-Jun-2021	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010
	10-Jun-2022	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00020	<0.00050	<0.00050	<0.00050	<0.0020	<0.00050	<0.00050	<0.00050	<0.00050	<0.00020	<0.00050	<0.00050	<0.00050
	16-Jun-2023	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010
	29-Oct-2023	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW28B	30-May-2014						-	-	-	-	-			-		-		-	-
	28-May-2015						-	-	-	-	-			-		-		-	-
	8-Jun-2016						-	-	-	-	-			-		-		-	-
	7-Jun-2017						-	-	-	-	-			-		-		-	-
	26-Jun-2018						-	-	-	-	-			-		-		-	-
	17-Jun-2019						<0.00050	<0.00050	<0.0010	<0.00050	<0.0020			<0.0010		<0.00020		<0.00050	<0.00050
	4-Jun-2020						<0.00050	<0.00050	<0.0010	<0.00050	<0.0020			<0.0010		<0.00020		<0.00050	<0.00050
	2-Jun-2021	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010
	10-Jun-2022	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00020	<0.00050	<0.00050	<0.00050	<0.0020	<0.00050	<0.00050	<0.00050	<0.00050	<0.00020	<0.00050	<0.00050	<0.00050
	16-Jun-2023	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010
MW29A	4-Jun-2015						-	-	-	-	-			-		-		-	-
	8-Jun-2016						-	-	-	-	-			-		-		-	-
	7-Jun-2017						-	-	-	-	-			-		-		-	-
	26-Jun-2018						-	-	-	-	-			-		-		-	-
	17-Jun-2019						<0.00050	<0.00050	<0.0010	<0.00050	<0.0020			<0.0010		<0.00020		<0.00050	<0.00050
	4-Jun-2020						<0.00050	<0.00050	<0.0010	<0.00050	<0.0020			<0.0010		<0.00020		<0.00050	<0.00050
	2-Jun-2021	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010
	10-Jun-2022	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0010	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	16-Jun-2023	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010
MW30A	4-Jun-2015						-	-	-	-	-			-		-		-	-
	8-Jun-2016						-	-	-	-	-			-		-		-	-
	7-Jun-2017						-	-	-	-	-			-		-		-	-
	26-Jun-2018						-	-	-	-	-			-		-		-	-
	17-Jun-2019						<0.00050	<0.00050	<0.0010	<0.00050	<0.0020			<0.0010		<0.00020		<0.00050	<0.00050
	29-May-2020						<0.00050	<0.00050	<0.0010	<0.00050	<0.0020			<0.0010		<0.00020		<0.00050	<0.00050
	2-Jun-2021	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010
	10-Jun-2022	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00020	<0.00050	<0.00050	<0.00050	<0.0020	<0.00050	<0.00050	<0.00050	<0.00050	<0.00020	<0.00050	<0.00050	<0.00050
	15-Jun-2023	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010
MW31A	4-Jun-2015						-	-	-	-	-			-		-		-	-
	8-Jun-2016						-	-	-	-	-			-		-		-	-
	7-Jun-2017						-	-	-	-	-			-		-		-	-
	26-Jun-2018						-	-	-	-	-			-		-		-	-
	17-Jun-2019						<0.00050	<0.00050	<0.0010	<0.00050	<0.0020			<0.0010		<0.00020		<0.00050	<0.00050
	5-Jun-2020						<0.00050	<0.00050	<0.0010	<0.00050	<0.0020			<0.0010		<0.00020		<0.00050	<0.00050
	3-Jun-2021	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010
	10-Jun-2022	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00020	<0.00050	<0.00050	<0.00050	<0.0020	<0.00050	<0.00050	<0.00050	<0.00050	<0.00020	<0.00050	<0.00050	<0.00050
	16-Jun-2023	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010

Monitoring Well	Date	1,4-Dichlorobenzene	1,1-Dichloroethane	1,2-Dichloroethane	1,1-Dichloroethene	1,2-Dichloroethene (cis)	1,2-Dichloroethene (trans)	Dichlorodifluoromethane	1,2-Dichloropropane	1,3-Dichloropropane	2,2-Dichloropropane	1,1-Dichloropropene	1,3-Dichloropropene [cis]	1,3-Dichloropropene [trans]	Hexachlorobutadiene	p-Isopropyltoluene	Methyl t-Butyl Ether (MTBE)	Methylene Chloride	Methyl Methacrylate
Parameter Group		Volatile Organic Compounds (VOCs)																	
Unit		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		0.001	-	0.005	0.014	-	-	-	-	-	-	-	-	-	-	-	0.015	0.05	0.47
MW26B	30-May-2014	-	-	-	-	-	-		-				-	-			-	-	-
	28-May-2015	-	-	-	-	-	-		-				-	-			-	-	-
	8-Jun-2016	-	-	-	-	-	-		-				-	-			-	-	-
	7-Jun-2017	-	-	-	-	-	-		-				-	-			-	-	-
	26-Jun-2018	-	-	-	-	-	-		-				-	-			-	<0.0020	-
	17-Jun-2019	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050		<0.00050				<0.00050	<0.00050			<0.00050	<0.0020	<0.00050
	5-Jun-2020	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050		<0.00050				<0.00050	<0.00050			<0.00050	<0.0020	<0.00050
	3-Jun-2021	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	-
	10-Jun-2022	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0010	-
	16-Jun-2023	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0015	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010
MW27B	30-May-2014	-	-	-	-	-	-		-				-	-			-	-	-
	28-May-2015	-	-	-	-	-	-		-				-	-			-	-	-
	8-Jun-2016	-	-	-	-	-	-		-				-	-			-	-	-
	7-Jun-2017	-	-	-	-	-	-		-				-	-			-	-	-
	26-Jun-2018	-	-	-	-	-	-		-				-	-			-	<0.0020	-
	17-Jun-2019	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050		<0.00050				<0.00050	<0.00050			<0.00050	<0.0020	<0.00050
	4-Jun-2020	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050		<0.00050				<0.00050	<0.00050			<0.00050	<0.0020	<0.00050
	2-Jun-2021	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	-
	10-Jun-2022	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0010	-
	16-Jun-2023	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0015	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010
	29-Oct-2023	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW28B	30-May-2014	-	-	-	-	-	-		-				-	-			-	-	-
	28-May-2015	-	-	-	-	-	-		-				-	-			-	-	-
	8-Jun-2016	-	-	-	-	-	-		-				-	-			-	-	-
	7-Jun-2017	-	-	-	-	-	-		-				-	-			-	-	-
	26-Jun-2018	-	-	-	-	-	-		-				-	-			-	<0.0020	-
	17-Jun-2019	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050		<0.00050				<0.00050	<0.00050			<0.00050	<0.0020	<0.00050
	4-Jun-2020	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050		<0.00050				<0.00050	<0.00050			<0.00050	<0.0020	<0.00050
	2-Jun-2021	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	-
	10-Jun-2022	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0010	-
	16-Jun-2023	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0015	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010
MW29A	4-Jun-2015	-	-	-	-	-	-		-				-	-			-	-	-
	8-Jun-2016	-	-	-	-	-	-		-				-	-			-	-	-
	7-Jun-2017	-	-	-	-	-	-		-				-	-			-	-	-
	26-Jun-2018	-	-	-	-	-	-		-				-	-			-	<0.0020	-
	17-Jun-2019	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050		<0.00050				<0.00050	<0.00050			<0.00050	<0.0020	<0.00050
	4-Jun-2020	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050		<0.00050				<0.00050	<0.00050			<0.00050	<0.0020	<0.00050
	2-Jun-2021	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	-
	10-Jun-2022	-	<0.00050	<0.00050	<0.00050	<0.00050	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050							
	16-Jun-2023	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0015	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010
MW30A	4-Jun-2015	-	-	-	-	-	-		-				-	-			-	-	-
	8-Jun-2016	-	-	-	-	-	-		-				-	-			-	-	-
	7-Jun-2017	-	-	-	-	-	-		-				-	-			-	-	-
	26-Jun-2018	-	-	-	-	-	-		-				-	-			-	<0.0020	-
	17-Jun-2019	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050		<0.00050				<0.00050	<0.00050			<0.00050	<0.0020	<0.00050
	29-May-2020	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050		<0.00050				<0.00050	<0.00050			<0.00050	<0.0020	<0.00050
	2-Jun-2021	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	-
	10-Jun-2022	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0010	-
	15-Jun-2023	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0015	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010
MW31A	4-Jun-2015	-	-	-	-	-	-		-				-	-			-	-	-
	8-Jun-2016	-	-	-	-	-	-		-				-	-			-	-	-
	7-Jun-2017	-	-	-	-	-	-		-				-	-			-	-	-
	26-Jun-2018	-	-	-	-	-	-		-				-	-			-	<0.0020	-
	17-Jun-2019	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050		<0.00050				<0.00050	<0.00050			<0.00050	<0.0020	<0.00050
	5-Jun-2020	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050		<0.00050				<0.00050	<0.00050			<0.00050	<0.0020	<0.00050
	3-Jun-2021	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	-
	10-Jun-2022	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0010	-
	16-Jun-2023	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0015	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010

Monitoring Well	Date	iso-Propylbenzene (cumene)	n-Propylbenzene	1,1,1,2-Tetrachloroethane	1,1,2,2-Tetrachloroethane	Tetrachloroethene	1,2,3-Trichlorobenzene	1,2,4-Trichlorobenzene	1,3,5-Trichlorobenzene	1,1,1-Trichloroethane	1,1,2-Trichloroethane	Trichloroethene	Trichlorofluoromethane	Trihalomethanes	1,2,3-Trichloropropane	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	Vinyl chloride
Parameter Group		Volatile Organic Compounds (VOCs)																
Unit		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		-	-	-	-	0.01	0.008	0.015	0.014	-	-	0.005	-	0.1	-	-	-	0.002
MW26B	30-May-2014			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	28-May-2015			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	8-Jun-2016			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	7-Jun-2017			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	26-Jun-2018			-	-	<0.00050	-	-	-	-	-	<0.00050	-	-		-	-	<0.00050
	17-Jun-2019			<0.0010	<0.0020	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0013		<0.00050	<0.00050	<0.00050
	5-Jun-2020			<0.0010	<0.0020	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0013		<0.00050	<0.00050	<0.00050
	3-Jun-2021	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0020	<0.0010	<0.0010	<0.0010
	10-Jun-2022	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	-	<0.00050	<0.00050	<0.00050	<0.00050	-	<0.00050	<0.00050	<0.00050	<0.00050
	16-Jun-2023	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010	<0.0010
MW27B	30-May-2014			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	28-May-2015			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	8-Jun-2016			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	7-Jun-2017			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	26-Jun-2018			-	-	<0.00050	-	-	-	-	-	<0.00050	-	-		-	-	<0.00050
	17-Jun-2019			<0.0010	<0.0020	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0013		<0.00050	<0.00050	<0.00050
	4-Jun-2020			<0.0010	<0.0020	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0013		<0.00050	<0.00050	<0.00050
	2-Jun-2021	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0020	<0.0010	<0.0010	<0.0010
	10-Jun-2022	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	-	<0.00050	<0.00050	<0.00050	<0.00050	-	<0.00050	<0.00050	<0.00050	<0.00050
	16-Jun-2023	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010	<0.0010
	29-Oct-2023	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW28B	30-May-2014			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	28-May-2015			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	8-Jun-2016			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	7-Jun-2017			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	26-Jun-2018			-	-	<0.00050	-	-	-	-	-	<0.00050	-	-		-	-	<0.00050
	17-Jun-2019			<0.0010	<0.0020	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0013		<0.00050	<0.00050	<0.00050
	4-Jun-2020			<0.0010	<0.0020	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0013		<0.00050	<0.00050	<0.00050
	2-Jun-2021	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0020	<0.0010	<0.0010	<0.0010
	10-Jun-2022	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	-	<0.00050	<0.00050	<0.00050	<0.00050	-	<0.00050	<0.00050	<0.00050	<0.00050
	16-Jun-2023	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010	<0.0010
MW29A	4-Jun-2015			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	8-Jun-2016			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	7-Jun-2017			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	26-Jun-2018			-	-	<0.00050	-	-	-	-	-	<0.00050	-	-		-	-	<0.00050
	17-Jun-2019			<0.0010	<0.0020	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0013		<0.00050	<0.00050	<0.00050
	4-Jun-2020			<0.0010	<0.0020	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0013		<0.00050	<0.00050	<0.00050
	2-Jun-2021	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0020	<0.0010	<0.0010	<0.0010
	10-Jun-2022																	
	16-Jun-2023	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010	<0.0010
MW30A	4-Jun-2015			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	8-Jun-2016			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	7-Jun-2017			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	26-Jun-2018			-	-	<0.00050	-	-	-	-	-	<0.00050	-	-		-	-	<0.00050
	17-Jun-2019			<0.0010	<0.0020	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0013		<0.00050	<0.00050	<0.00050
	29-May-2020			<0.0010	<0.0020	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0013		<0.00050	<0.00050	<0.00050
	2-Jun-2021	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0020	<0.0010	<0.0010	<0.0010
	10-Jun-2022	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	-	<0.00050	<0.00050	<0.00050	<0.00050	-	<0.00050	<0.00050	<0.00050	<0.00050
	15-Jun-2023	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010	<0.0010
MW31A	4-Jun-2015			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	8-Jun-2016			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	7-Jun-2017			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	26-Jun-2018			-	-	<0.00050	-	-	-	-	-	<0.00050	-	-		-	-	<0.00050
	17-Jun-2019			<0.0010	<0.0020	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0013		<0.00050	<0.00050	<0.00050
	5-Jun-2020			<0.0010	<0.0020	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0013		<0.00050	<0.00050	<0.00050
	3-Jun-2021	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0020	<0.0010	<0.0010	<0.0010
	10-Jun-2022	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	-	<0.00050	<0.00050	<0.00050	<0.00050	-	<0.00050	<0.00050	<0.00050	<0.00050
	16-Jun-2023	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010	<0.0010

Notes:

[1] Alberta Environment and Parks (AEP). 2022. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. ISBN 978-1-4601-5501-1. Referenced guidelines are for fine textured soils under Agricultural land use

[2] Alberta Environment and Parks (AEP). Environmental Quality Guidelines for Alberta Surface Waters. March 2018. Table 1 Surface water quality guidelines for the protection of freshwater aquatic life (PAL). Most conservative values applied (chronic or acute).

[3] Guideline varies with hardness.

[4] Guideline varies with pH and temperature.

[5] Guideline varies with chloride.

[6] Guideline varies with pH.

"-" No applicable guideline or not analyzed.

BOLD - Greater than Tier 1 Guideline.

Italic - Detection limit greater than Tier 1 guideline.

* - laboratory filtered.

Table 4b: Field and Groundwater Analytical Results Summary - Upper Sandstone Wells

Parameter Group: Volatile Organic Compounds (VOCs)

Monitoring Well	Date	Bromobenzene	Bromochloromethane	n-Butylbenzene	sec-Butylbenzene	tert-Butylbenzene	Carbon tetrachloride	Chlorobenzene	Chloroethane	Chloroform	Chloromethane	2-Chlorotoluene	4-Chlorotoluene	Dibromochloromethane	1,2-Dibromo-3-chloropropane	1,2-Dibromoethane	Dibromomethane	1,2-Dichlorobenzene	1,3-Dichlorobenzene
	Unit	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		-	-	-	-	-	0.002	0.0013	-	0.08	-	-	-	0.1	-	-	-	0.0007	-
MW33A	28-May-2015						-	-	-	-	-			-		-		-	-
	8-Jun-2016						-	-	-	-	-			-		-		-	-
	7-Jun-2017						-	-	-	-	-			-		-		-	-
	26-Jun-2018						-	-	-	-	-			-		-		-	-
	12-Jun-2019						<0.00050	<0.00050	<0.0010	<0.00050	<0.0020			<0.0010		<0.00020		<0.00050	<0.00050
	4-Jun-2020						<0.00050	<0.00050	<0.0010	<0.00050	<0.0020			<0.0010		<0.00020		<0.00050	<0.00050
	4-Jun-2021	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010
	10-Jun-2022	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00020	<0.00050	<0.00050	<0.00050	<0.0020	<0.00050	<0.00050	<0.00050	<0.00050	<0.00020	<0.00050	<0.00050	<0.00050
	15-Jun-2023	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010
15MW35B	8-Jun-2016						-	-	-	-	-			-		-		-	-
	7-Jun-2017						-	-	-	-	-			-		-		-	-
	26-Jun-2018						-	-	-	-	-			-		-		-	-
	17-Jun-2019						<0.00050	<0.00050	<0.0010	<0.00050	<0.0020			<0.0010		<0.00020		<0.00050	<0.00050
	5-Jun-2020						<0.00050	<0.00050	<0.0010	<0.00050	<0.0020			<0.0010		<0.00020		<0.00050	<0.00050
	2-Jun-2021	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010
	9-Jun-2022	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00020	<0.00050	<0.00050	<0.00050	<0.0020	<0.00050	<0.00050	<0.00050	<0.00050	<0.00020	<0.00050	<0.00050	<0.00050
	16-Jun-2023	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010

Monitoring Well	Date	1,4-Dichlorobenzene	1,1-Dichloroethane	1,2-Dichloroethane	1,1-Dichloroethene	1,2-Dichloroethene (cis)	1,2-Dichloroethene (trans)	Dichlorodifluoromethane	1,2-Dichloropropane	1,3-Dichloropropane	2,2-Dichloropropane	1,1-Dichloropropene	1,3-Dichloropropene [cis]	1,3-Dichloropropene [trans]	Hexachlorobutadiene	p-Isopropyltoluene	Methyl t-Butyl Ether (MTBE)	Methylene Chloride	Methyl Methacrylate
	Unit	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		0.001	-	0.005	0.014	-	-	-	-	-	-	-	-	-	-	-	0.015	0.05	0.47
MW33A	28-May-2015	-	-	-	-	-	-		-				-	-			-	-	-
	8-Jun-2016	-	-	-	-	-	-		-				-	-			-	-	-
	7-Jun-2017	-	-	-	-	-	-		-				-	-			-	-	-
	26-Jun-2018	-	-	-	-	-	-		-				-	-			-	<0.0020	-
	12-Jun-2019	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050		<0.00050				<0.00050	<0.00050			<0.00050	<0.0020	<0.00050
	4-Jun-2020	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050		<0.00050				<0.00050	<0.00050			<0.00050	<0.0020	<0.00050
	4-Jun-2021	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	-
	10-Jun-2022	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0010	-
	15-Jun-2023	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0015	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010
15MW35B	8-Jun-2016	-	-	-	-	-	-		-				-	-			-	-	-
	7-Jun-2017	-	-	-	-	-	-		-				-	-			-	-	-
	26-Jun-2018	-	-	-	-	-	-		-				-	-			-	<0.0020	-
	17-Jun-2019	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050		<0.00050				<0.00050	<0.00050			<0.00050	<0.0020	<0.00050
	5-Jun-2020	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050		<0.00050				<0.00050	<0.00050			<0.00050	<0.0020	<0.00050
	2-Jun-2021	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	-
	9-Jun-2022	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0010	-
	16-Jun-2023	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0015	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010

Monitoring Well	Date	iso-Propylbenzene (cumene)	n-Propylbenzene	1,1,1,2-Tetrachloroethane	1,1,2,2-Tetrachloroethane	Tetrachloroethene	1,2,3-Trichlorobenzene	1,2,4-Trichlorobenzene	1,3,5-Trichlorobenzene	1,1,1-Trichloroethane	1,1,2-Trichloroethane	Trichloroethene	Trichlorofluoromethane	Trihalomethanes	1,2,3-Trichloropropane	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	Vinyl chloride
	Unit	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		-	-	-	-	0.01	0.008	0.015	0.014	-	-	0.005	-	0.1	-	-	-	0.002
MW33A	28-May-2015			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	8-Jun-2016			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	7-Jun-2017			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	26-Jun-2018			-	-	<0.00050	-	-	-	-	-	<0.00050	-	-		-	-	<0.00050
	12-Jun-2019			<0.0010	<0.0020	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0013		<0.00050	<0.00050	<0.00050
	4-Jun-2020			<0.0010	<0.0020	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0013		<0.00050	<0.00050	<0.00050
	4-Jun-2021	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0020	<0.0010	<0.0010	<0.0010
	10-Jun-2022	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	-	<0.00050	<0.00050	<0.00050	<0.00050	-	<0.00050	<0.00050	<0.00050	<0.00050
	15-Jun-2023	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010	<0.0010
15MW35B	8-Jun-2016			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	7-Jun-2017			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	26-Jun-2018			-	-	<0.00050	-	-	-	-	-	<0.00050	-	-		-	-	<0.00050
	17-Jun-2019			<0.0010	<0.0020	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0013		<0.00050	<0.00050	<0.00050
	5-Jun-2020			<0.0010	<0.0020	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0013		<0.00050	<0.00050	<0.00050
	2-Jun-2021	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0020	<0.0010	<0.0010	<0.0010
	9-Jun-2022	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	-	<0.00050	<0.00050	<0.00050	<0.00050	-	<0.00050	<0.00050	<0.00050	<0.00050
	16-Jun-2023	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010	<0.0010

Notes:
[1] Alberta Environment and Parks (AEP). 2022. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. ISBN 978-1-4601-5501-1. Referenced guidelines are for fine textured soils under Agricultural land use
[2] Alberta Environment and Parks (AEP). Environmental Quality Guidelines for Alberta Surface Waters. March 2018. Table 1 Surface water quality guidelines for the protection of freshwater aquatic life (PAL). Most conservative values applied (chronic or acute).
[3] Guideline varies with hardness.
[4] Guideline varies with pH and temperature.
[5] Guideline varies with chloride.
[6] Guideline varies with pH.
"-" No applicable guideline or not analyzed.
BOLD - Greater than Tier 1 Guideline.
Italic - Detection limit greater than Tier 1 guideline.
* - laboratory filtered.

TETRA TECH

Table 4c: Field and Groundwater Analytical Results Summary - Clay Shale Wells

Parameter Group		Field			Routine																	Nutrients					Hydrocarbons											Organics		
Parameter		pH	Electrical Conductivity	Temperature	pH	Electrical Conductivity	Total Dissolved Solids	Hardness	Alkalinity, total (as CaCO3)	Bicarbonate	Carbonate	Hydroxide	Calcium	Magnesium	Potassium	Sodium	Chloride	Fluoride	Sulphate	Ionic Balance	Ammonia-N	Nitrate (N)	Nitrite (N)	Nitrate and Nitrate (N)	Total Kjeldahl Nitrogen	Benzene	Toluene	Ethylbenzene	Xylenes (m & p)	Xylene (o)	Xylenes	Styrene	F1 (C6-C10)	F1-BTEX	F2 (C10-C16)	Total Phenols	Chemical Oxygen Demand	Dissolved Organic Carbon
Unit		pH Units			pH Units	µS/cm	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	-	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		6.5-8.5	1000	-	6.5-8.5	1000	500	-	-	-	-	-	-	-	-	200	100	1	128-429	-	0.018-190	3	0.02-0.20	100	-	0.005	0.024	0.0016	-	-	0.02	0.072	2.2	2.2	1.1	-	-	-
Monitoring Well	Date																																							
MW1B	6-Jun-2014	**9.9**	**2950**	7.5	8.05	**2800**	**2000**	-	-	1100	<0.50	-	1.7	2.5	**740**	5.1	-	**680**	-	<0.050	**3.7**	-	-	2.2*	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	98	9.9
	28-May-2015	8.4	**3050**	8.3	8.24	**2900**	**2000**	37	880	1100	<0.50	<0.50	12	1.6	2.4	**740**	6.1	-	**680**	1.0	0.26	0.89	0.016	0.91	1.6	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	120	10
	8-Jun-2016	**6.33**	**3670**	-	8.44	**2700**	**1800**	30	900	1100	13	<0.50	10	1.3	2.1	**680**	6.1	-	**540**	1.0	0.36	1.1	0.019	1.1	0.96	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	47	8.8
	7-Jun-2017	-	-	-	**8.54**	**2900**	**1800**	35	890	1000	21	<0.50	12	1.6	2.2	**670**	6.2	-	**610**	1.9	-	**13**	<0.033	2.8	-	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.27	-	-	11
	26-Jun-2018	-	-	-	8.29	**2500**	**1600**	27	940	1100	<1.0	<1.0	9.1	1.1	2.2	**620**	9.6	-	**390**	0.52	**0.2**	**3.3**	0.037	3.3	3.2	<0.00040	<0.00040	<0.00040	-	-	<0.00089	<0.00050	-	<0.10	<0.10	<0.0020	130	9.3
	12-Jun-2019	8.1	**2360**	10.3	**8.54**	**2300**	**1500**	23	960	1100	43	<1.0	7.9	0.91	2	**570**	5.9	-	**300**	0.31	0.30	0.79	**0.069**	0.86	4	<0.00040	<0.00040	<0.00040	<0.00080	<0.00040	<0.00089	<0.00050	<0.10	<0.10	<0.10	<0.0015	250	8.5
	5-Jun-2020	7.91	**2480**	8.4	8.43	**2500**	**1600**	30	870	1000	16	<1.0	10	1.3	2.2	**630**	6.2	-	**430**	3.2	0.30	0.8	0.025	0.82	2.9	<0.00040	<0.00040	<0.00040	<0.00080	<0.00040	<0.00089	<0.00050	<0.10	<0.10	<0.10	<0.0015	135	12
	4-Jun-2021	8.06	**2110**	10.7	**8.65**	**2210**	**1520**	22	943	1080	32.3	<5.0	7.48	0.94	1.9	**558**	5.2	**1.07**	**383**	91.9	0.32	0.278	0.043	0.32	1.1	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00071	<0.00050	<0.10	<0.10	<0.10	<0.0010	42	8.6
	10-Jun-2022	**8.65**	**2520**	9.5	**8.62**	**2080**	**1430**	19.6	1120	1290	35.5	<1.0	6.53	0.804	1.8	**509**	5.45	**1.03**	**210**	83.7	**0.304**	0.593	0.048	0.641	0.9	<0.00050	<0.00050	<0.00050	<0.00030	<0.00040	<0.00050	<0.00050	<0.10	<0.10	<0.10	<0.0010	36	8.48
	15-Jun-2023	8.27	**2030**	10.4	**8.9**	**1,840**	**1,350**	19.9	1,080	1,170	69.4	<1.0	6.58	0.845	2.01	**532**	5.53	**0.856**	**139**	95.5	0.368	0.261	<0.050	0.261	1.19	<0.00050	<0.00050	<0.00050	<0.00040	<0.00030	<0.00050	<0.00050	<0.10	<0.100	<0.10	<0.0010	66	7.6
MW8A	30-May-2014	8.4	**2560**	5.4	**8.67**	**2400**	**1600**	-	-	1300	49	-	7.7	1.7	2.2	**610**	8.0	-	**300**	-	**0.89**	<0.010	-	-	1.5	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	68	9
	28-May-2015	8.5	**2910**	6.0	8.32	**2700**	**1800**	25	1100	1300	3.0	<0.50	7.6	1.5	2.1	**670**	7.6	-	**450**	0.97	**0.96**	<0.010	0.012	0.012	1.6	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	71	10
	8-Jun-2016	**8.51**	**2810**	8.7	8.49	**2400**	**1500**	25	1000	1200	25	<0.50	7.8	1.3	2.3	**600**	7.4	-	**290**	1.0	**0.81**	<0.010	<0.010	<0.020	1.1	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	36	11
	7-Jun-2017	8.5	**2670**	8.4	8.49	**2500**	**1700**	26	1100	1300	21	<0.50	8.3	1.3	2.4	**630**	7.1	-	**360**	2.2	**0.63**	<0.044	<0.033	<0.010	1.3	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	40	12
	26-Jun-2018	7.84	**2630**	6.9	8.48	**2400**	**1600**	22	1100	1300	27	<1.0	7.1	1.0	2.0	**650**	7.3	-	**270**	1.4	0.72	<0.020	<0.010	<0.020	1.4	<0.00040	<0.00040	<0.00040	-	-	<0.00089	<0.00050	-	<0.10	<0.10	<0.0020	51	12
	12-Jun-2019	8.15	**2820**	12.2	8.44	**2800**	**1900**	31	1100	1300	34	<1.0	10	1.4	2.3	**680**	7.5	-	**550**	5.1	**0.76**	0.029	0.027	0.056	1.3	<0.00040	<0.00040	<0.00040	<0.00080	<0.00040	<0.00089	<0.00050	<0.10	<0.10	<0.10	<0.0015	46	14
	29-May-2020	8.21	**2480**	9.5	8.48	**2400**	**1500**	22	1000	1200	24	<1.0	7.3	0.93	1.7	**630**	7.7	-	**230**	3.9	**0.83**	0.044	0.016	0.06	1.5	<0.00040	<0.00040	<0.00040	<0.00080	<0.00040	<0.00089	<0.00050	<0.10	<0.10	<0.10	<0.0015	34	12
	4-Jun-2021	8.47	**2240**	10.9	**8.79**	**2190**	**1500**	20.8	1120	1260	54.5	<5.0	6.72	0.97	1.85	**570**	6.09	**1.17**	**246**	91	**0.726**	0.022	<0.010	0.022	1.28	0.00092	<0.00050	<0.00050	<0.00050	<0.00050	<0.00071	<0.00050	<0.10	<0.10	<0.10	<0.0010	51	13.3
	10-Jun-2022	8.14	**2750**	13.7	**8.68**	**2270**	**1560**	20.3	1210	1390	45.6	<1.0	6.55	0.965	1.82	**564**	5.86	**1.18**	**223**	86.2	**0.752**	<0.040	<0.020	<0.050	1.28	<0.00050	<0.00050	<0.00050	<0.00050	<0.00040	<0.00050	<0.00050	<0.10	<0.10	<0.10	<0.0010	36	15.5
	15-Jun-2023	8.55	**2510**	15.2	**8.97**	**2,110**	**1,570**	22.1	1,160	1,240	87.5	<1.0	7.07	1.08	2.06	**615**	6.13	0.942	**216**	97.8	**0.853**	<0.100	<0.050	<0.112	1.28	<0.00050	<0.00050	<0.00050	<0.00040	<0.00030	<0.00050	<0.00050	<0.10	<0.100	<0.10	0.002	40	13.2
MW12B	30-May-2014	7.3	**11,870**	6.9	8.17	**11,000**	**11,000**	-	-	870	<0.50	-	380	78	11	**3400**	6.2	-	**6800**	-	2.1	0.2	-	-	3.3	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	71	21
	28-May-2015	7.7	**11,500**	7.5	7.71	**11,000**	**9700**	890	700	850	<0.50	<0.50	260	60	10	**2800**	5.6	-	**6100**	0.98	**2.2**	0.12	0.038	0.16	1.4	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	61	22
	8-Jun-2016	**6.28**	**13,830**	-	8.00	**11,000**	**8900**	900	670	820	<0.50	<0.50	270	54	11	**2500**	6.0	-	**5600**	0.99	2.1	0.19	0.053	0.25	2.8	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	71	24
	7-Jun-2017	7.4	**11,500**	6.3	7.87	**11,000**	**8600**	950	710	860	<0.50	<0.50	280	63	9.3	**2600**	4.6	-	**5300**	3.2	1.7	<0.22	<0.16	<0.050	2.8	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	52	21
	26-Jun-2018	8.2	**11,720**	5.8	8.01	**11,000**	**8200**	780	670	820	<1.0	<1.0	230	47	9.3	**2500**	4.7	-	**4900**	4.5	**1.1**	0.64	0.012	0.65	2.1	<0.00040	<0.00040	<0.00040	-	-	<0.00089	<0.00050	-	<0.10	<0.10	<0.0020	53	19
	12-Jun-2019	7.32	**12,410**	8.3	7.96	**13,000**	**10000**	1200	800	970	<1.0	<1.0	360	69	<30	**2900**	7.9	-	**6100**	2.5	2.3	0.71	<0.20	0.71	3.3	<0.00040	<0.00040	<0.00040	<0.00080	<0.00040	<0.00089	<0.00050	<0.10	<0.10	<0.10	<0.0015	80	35
	4-Jun-2020	7.36	**10,710**	5.6	7.93	**11,000**	**8,500**	830	660	810	<1.0	<1.0	240	59	8.5	**2700**	4.6	-	**5100**	5.7	1.8	0.19	0.028	0.22	1.9	<0.00040	<0.00040	<0.00040	<0.00080	<0.00040	<0.00089	<0.00050	<0.10	<0.10	<0.10	<0.0015	52	21
	4-Jun-2021	7.75	**10,130**	11.3	7.16	**8,890**	**9,060**	625	649	792	<5.0	<5.0	201	30	8.83	**2610**	<5.0	0.24	**5810**	94.2	**1.94**	1.78	**0.86**	2.64	7.11	<0.00040	<0.00040	<0.00040	<0.00080	<0.00040	<0.00071	<0.00050	<0.10	<0.10	<0.10	<0.0010	237	22.2
	10-Jun-2022	7.84	**11,410**	18.5	8.16	**9,230**	**8,300**	542	831	1010	<1.0	<1.0	176	25	8.06	**2370**	<5.0	<0.20	**5180**	91.2	**2.16**	2.69	**0.348**	3.04	3.05	<0.00050	<0.00050	<0.00050	<0.00030	<0.00040	<0.00050	<0.00050	<0.10	<0.10	<0.10	<0.0010	39	18
	15-May-2023	7.67	**8,130**	14.7	8.38	**7,650**	**6,370**	415	686	817	9.6	<1.0	134	19.5	7.57	**1,980**	5.66	0.33	**3,770**	102	**1.44**	1.47	**0.559**	2.03	3.71	<0.00050	<0.00050	<0.00050	<0.00040	<0.00030	<0.00050	<0.00050	<0.10	<0.100	<0.10	0.0041	-	14.2
MW18A	30-May-2014	8.4	**15,820**	6.4	**8.61**	**15,000**	**920**	-	-	970	38	-	3	<2.0	<3.0	**390**	7.3	-	2.4	-	**0.62**	<0.010	-	-	5.7	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	29	5.2
	28-May-2015	**8.8**	**1640**	6.6	8.39	**1500**	**880**	8.1	840	1000	8.9	<0.50	2.7	0.30	1.3	**360**	7.2	-	1.4	0.95	**0.64**	<0.010	<0.010	<0.010	0.98	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	28	6.9
	8-Jun-2016	6.75	**1920**	8.3	8.44	**1500**	**870**	8.9	800	950	9.5	<0.50	3.0	0.34	1.5	**380**	7.4	-	6.9	1.0	0.66	0.011	<0.010	<0.020	0.90	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	27	6.9
	7-Jun-2017	8.5	**1520**	8.7	8.50	**1500**	**910**	8.4	850	1000	17	<0.50	2.9	0.31	1.4	**380**	7.3	-	2.1	0.86	**0.72**	<0.044	<0.033	<0.010	1.0	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	26	7.2
	26-Jun-2018	8.2	**1719**	6.1	8.45	**1500**	**910**	8.3	850	1000	14	<1.0	2.8	0.30	1.4	**380**	7.5	-	<1.0	1.1	0.59	<0.020	<0.010	<0.020	0.92	<0.00040	<0.00040	<0.00040	-	-	<0.00089	<0.00050	-	<0.10	<0.10	<0.0020	35	7.4
	12-Jun-2019	**8.53**	**1592**	9.4	8.49	**1500**	**880**	8.3	840	990	19	<1.0	2.9	0.25	1.4	**360**	7.3	-	1.6	3.1	**0.60**	<0.010	<0.010	<0.014	0.92	<0.00040	<0.00040	<0.00040	<0.00080	<0.00040	<0.00089	<0.00050	<0.10	<0.10	<0.10	<0.0015	37	9.7
	4-Jun-2020	**8.53**	**1547**	6.3	8.40	**1500**	**870**	8.9	780	930	16	<1.0	3	0.37	1.4	**390**	7.6	-	<1.0	4.2	**0.63**	<0.010	<0.010	<0.014	1.0	<0.00040	<0.00040	<0.00040	<0.00080	<0.00040	<0.00089	<0.00050	<0.10	<0.10	<0.10	<0.0015	26	6.6
	4-Jun-2021	**8.60**	**1398**	7.8	**8.70**	**1380**	**957**	9	869	994	32.5	<5.0	3	0.36	1.44	**423**	6.38	**1.79**	<0.30	106	**0.63**	<0.020	<0.010	<0.022	0.9	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00071	<0.00050	<0.10	<0.10	<0.10	<0.0010	31	10.6
	10-Jun-2022	8.15	**1760**	7.9	**8.65**	**1460**	**995**	8.66	948	1090	33.4	<1.0	2.86	0.37	1.42	**392**	6.57	**1.57**	0.59	90.1	0.601	<0.020	<0.010	<0.050	0.95	<0.00050	<0.00050	<0.00050	<0.00030	<0.00040	<0.00050	<0.00050	<0.10	<0.10	<0.10	<0.0010	24	9.53
	15-Jun-2023	8.71	**1521**	11.9	**8.97**	**1,370**	**948**	8.58	847	908	41.4	<0.50	2.84	0.361	1.47	**367**	6.34	**1.38**	<0.30	104	**0.71**	<0.020	<0.010	<0.050	1.0	<0.00050	<0.00050	<0.00050	<0.00030	<0.00040	<0.00050	<0.00050	<0.10	<0.100	<0.10	<0.0010	24	9.74
MW19A	30-May-2014	8.2	**6350**	8.7	8.09	**7900**	**6700**	-	-	1200	<0.50	-	90	42	8.9	**2200**	8.8	-	**3700**	-	**0.98**	0.15	-	-	1.4	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	20	6
	28-May-2015	7.7	**7870**	6.3	7.99	**7500**	**6000**	310	950	1200	<0.50	<0.50	62	37	9.4	**1900**	8.9	-	**3400**	0.96	0.43	0.023	0.015	0.038	0.80	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	25	7.5
	8-Jun-2016	7.97	**8510**	-	8.25	**6900**	**5200**	270	880	1100	<0.50	<0.50	55	32	8.6	**1900**	6.7	-	**3000**	0.91	**0.48**	<0.050	<0.050	<0.020	0.96	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	19	7.1
	7-Jun-2017	7.6	**6000**	7.7	8.31	**6900**	**5200**	270	970	1200	<0.50	<0.50	57	32	8.6	**1700**	7.4	-	**2800**	2.2	0.76	0.16	**0.28**	-	1.1	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	27	7.1
	26-Jun-2018	8.1	**7390**	12.0	8.22	**7000**	**5300**	250	980	1200	<1.0	<1.0	63	31	7.4	**1700**	8.2	-	**2900**	0.51	**1.2**	0.022	<0.010	0.022	1.5	<0.00040	<0.00040	<0.00040	-	-	<0.00089	<0.00050	-	<0.10	<0.10	<0.0020	23	8.0
	12-Jun-2019	7.92	**7270**	11.1	8.24	**7500**	**5200**	250	980	1200	<1.0	<1.0	64	23	<30	**1700**	9.4	-	**2800**	0.96	0.87	<0.10	**0.11**	<0.14	1.2	<0.00040	<0.00040	<0.00040	<0.00080	<0.00040	<0.00089	<0.00050	<0.10	<0.10	<0.10	<0.0015	23	8.3
	4-Jun-2020	7.91	**6680**	8.0	7.97	**6600**	**5000**	220	920	1100	<1.0	<1.0	56	19	6.5	**1700**	15	-	**2600**	3.9	1.2	0.011	<0.010	<0.014	1.8	<0.00040	<0.00040	<0.00040	<0.00080	<0.00040	<0.00089	<0.00050	<0.10	<0.10	<0.10	<0.0015	20	8.6
	4-Jun-2021	7.53	**6680**	11.1	8.41	**6610**	**5960**	303	1020	1210	16.4	<5.0	67.6	32.5	9.29	**1970**	10.6	0.39	**3250**	104	0.935	0.69	<0.10	0.69	1.6	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00071	<0.00050	<0.10	<0.10	<0.10	0.0025	32	10
	10-Jun-2022	7.74	**8060**	9.3	**8.59**	**6560**	**5340**	228	1140	1310	38.8	<1.0	50.8	24.5	7.01	**1590**	10.3	0.405	**2950**	87.6	1.04	<0.10	<0.050	<0.112	1.5	<0.00050	<0.00050	<0.00050	<0.00030	<0.00040	<0.00050	<0.00050	<0.10	<0.10	0.64	<0.0010	24	8.74
	15-Jun-2023	8.16	**5520**	13.4	**8.75**	**5,490**	**5,090**	244	815	897	47.6	<1.0	49.4	29.3	8.42	**1,710**	9.69	0.376	**2,770**	107	**1.52**	<0.200	<0.100	<0.224	1.6	<0.00050	<0.00050	<0.00050	<0.00040	<0.00030	<0.00050	<0.00050	<0.10	<0.100	<0.10	0.0033	19	8.06
MW20A	30-May-2014	8.0	**3500**	7.8	8.05	**3300**	**2300**	-	-	1300	<0.50	-	19	2.7	3.3	**800**	6.9	-	**800**	-	0.33	1.8	-	-	2.1	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	66	4.4
	28-May-2015	8.2	**3310**	7.9	8.03	**3100**	**2100**	54	1000	1200	<0.50	<0.50	18	2.4	3.5	**750**	8.3	-	**680**	0.96	0.23	**6.6**	0.061	6.7	0.93	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	28	5.7
	8-Jun-2016	**8.6**	**3570**	8.1	8.15	**3300**	**2200**	58	1100	1300	<0.50	<0.50	19	2.5	3.3	**830**	7.0	-	**740**	1.0	**0.53**	**3.1**	0.041	3.1	1.2	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	19	4.3
	7-Jun-2017	7.8	**3000**	6.9	8.34	**3200**	**2100**	54	1000	1200	5.5	<0.50	18	2.4	2.9	**780**	7.9	-	**660**	0.38	0.30	**21**	**0.28**	4.9	1.0	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	35	6.4
	26-Jun-2018	7.8	**3120**	6.5	8.08	**3400**	**2300**	64	1000	1300	<1.0	<1.0	21	2.8	3.4	**850**	8.1	-	**820**	0.042	0.28	2.8	0.036	2.8	1.0	<0.00040	<0.00040	<0.00040	-	-	<0.00089	<0.00050	-	<0.10	<0.10	<0.0020	26	5.4
	12-Jun-2019	7.6	**2610**	9.8	8.28	**3400**	**2200**	65	1000	1300	<1.0	<1.0	21	2.7	3.4	**820**	7.1	-	**740**	0.7	0.17	3	0.057	3.1	1.0	<0.00040	<0.00040	<0.00040	<0.00080	<0.00040	<0.00089	<0.00050	<0.10	<0.10	<0.10	<0.0015	38	6.9
	4-Jun-2020	7.52	**3770**	9.1	8.17	**3700**	**2600**	100	920	1100	<1.0	<1.0	32	5.2	3.7	**960**	6.4	-	**1000**	4.50	0.4	1.8	0.021	1.8	0.7	<0.00040	<0.00040	<0.00040	<0.00080	<0.00040	<0.00089	<0.00050	<0.10	<0.10	<0.10	<0.0015	<10	5.3
	3-Jun-2021	7.53	**3560**	9.3	**8.57**	**3310**	**2790**	102	984	1140	27.8	<5.0	32.8	4.91	4.84	**1080**	4.8	0.33	**1070**	117.00	0.418	0.8	<0.050	0.76	0.5	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00071	<0.00050	<0.10	<0.10	<0.10	<0.0010	10	6.4
	10-Jun-2022	7.66	**4550**	7.6	**8.52**	**3650**	**2750**	102	1110	1300	27.2	<1.0	31.3	5.8	4.02	**887**	4.91	0.393	**1130**	88.90	0.581	0.7	<0.050	0.668	0.9	<0.00050	<0.00050	<0.00050	<0.00030	<0.00040	<0.00050	<0.00050	<0.10	<0.10	<0.10	<0.0010	16	6.42
	15-Jun-2023	8.05	**3930**	9.6	**8.74**	**3,450**	**2,780**	93.3	889	995	44.2	<1.0	29.8	4.58	4.4	**974**	<5.00	0.312	**1,210**	103	0.502	1.14	<0.100	1.14	0.84	<0.00050	<0.00050	<0.00050	<0.00040	<0.00030	<0.00050	<0.00050	<0.10	<0.100	<0.10	<0.0010	17	7.34

Notes:

[1] Alberta Environment and Parks (AEP). 2022. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. ISBN 978-1-4601-5501-1. Referenced guidelines are for fine textured soils under Agricultural land use

[2] Alberta Environment and Parks (AEP). Environmental Quality Guidelines for Alberta Surface Waters. March 2018. Table 1 Surface water quality guidelines for the protection of freshwater aquatic life (PAL). Most conservative values applied (chronic or acute).

[a] Guideline varies with hardness.

[b] Guideline varies with pH and temperature.

[c] Guideline varies with chloride.

[d] Guideline varies with pH.

"-" No applicable guideline or not analyzed.

BOLD - Greater than Tier 1 Guideline.

Italic - Detection limit greater than Tier 1 guideline.

* - laboratory filtered.

TETRA TECH

Table 4c: Field and Groundwater Analytical Results Summary - Clay Shale Wells

Parameter Group		Field			Routine																	Nutrients					Hydrocarbons										Organics		
Parameter		pH	Electrical Conductivity	Temperature	pH	Electrical Conductivity	Total Dissolved Solids	Hardness	Alkalinity, total (as CaCO3)	Bicarbonate	Carbonate	Hydroxide	Calcium	Magnesium	Potassium	Sodium	Chloride	Fluoride	Sulphate	Ionic Balance	Ammonia-N	Nitrate (N)	Nitrite (N)	Nitrate and Nitrate (N)	Total Kjeldahl Nitrogen	Benzene	Toluene	Ethylbenzene	Xylenes (m & p)	Xylene (o)	Xylenes	Styrene	F1 (C6-C10)	F1-BTEX	F2 (C10-C16)	Total Phenols	Chemical Oxygen Demand	Dissolved Organic Carbon
Unit		pH Units			pH Units	µS/cm	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	-	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		6.5-8.5	1000	-	6.5-8.5	1000	500	-	-	-	-	-	-	-	-	200	100	1	128-429	-	0.018-190	3	0.02-0.20	100	-	0.005	0.024	0.0016	-	-	0.02	0.072	2.2	2.2	1.1	-	-	-
Monitoring Well	Date																																						
MW21A	6-Jun-2014	**9.9**	**2120**	8.3	8.18	**2000**	**1200**	-	-	1300	<0.50	-	4.4	0.47	1.8	**470**	9.3	-	90	-	**0.068**	2.3	-	-	1.4	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	96	7
	4-Jun-2015	8.3	**2110**	8.4	8.19	**2000**	**1200**	13	1100	1300	<0.50	<0.50	4.4	0.44	1.9	**490**	9.4	-	72	0.92	0.12	1.2	0.012	1.2	1.7	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	74	8.4
	8-Jun-2016	7.88	**2140**	7.9	8.29	**2000**	**1200**	14	1100	1300	<0.50	<0.50	4.7	0.45	1.7	**490**	8.7	-	71	0.93	0.12	1.3	0.023	1.3	0.81	<0.00040	0.00074	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	28	7.1
	7-Jun-2017	7.9	**2030**	7.5	8.41	**2000**	**1200**	12	1100	1300	11	<0.50	4.3	0.40	1.5	**480**	11	-	65	4.4	0.071	**4.1**	0.064	0.96	0.96	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	43	9.2
	26-Jun-2018	7.9	**2240**	7.8	8.35	**2000**	**1300**	12	1100	1300	8	<1.0	4.3	0.40	1.7	**530**	11	-	63	0.25	0.039	0.62	<0.010	0.62	0.92	<0.00040	<0.00040	<0.00040	-	-	<0.00089	<0.00050	-	<0.10	<0.10	0.0023	49	9.1
	17-Jun-2019	7.93	**2140**	13.6	**8.51**	**2100**	**1200**	12	1100	1200	47	<1.0	4.3	0.42	1.6	**470**	11	-	66	5.0	0.097	0.98	<0.010	0.98	0.73	<0.00040	<0.00040	<0.00040	<0.00080	<0.00040	<0.00080	<0.00050	<0.10	<0.10	<0.10	<0.0015	39	10
	5-Jun-2020	7.88	**1994**	7.7	8.41	**2000**	**1200**	13	1000	1200	11	<1.0	4.6	0.47	1.7	**540**	10	-	68	4.1	0.063	1.4	<0.010	1.4	0.47	<0.00040	<0.00040	<0.00040	<0.00080	<0.00040	<0.00080	<0.00050	<0.10	<0.10	<0.10	<0.0015	32	8.5
	3-Jun-2021	7.73	**1857**	9.9	**8.63**	**1790**	**1330**	16	1110	1290	33.8	<5.0	5.24	0.6	2.14	**605**	8.2	0.76	39.1	114.0	0.389	0.36	<0.050	0.36	2.58	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00071	<0.00050	<0.10	<0.10	<0.10	<0.0010	74	8.9
	10-Jun-2022	7.52	**2260**	8.4	**8.61**	**1940**	**1320**	12.5	1180	1360	34.2	<1.0	4.22	0.472	1.74	**509**	9.13	0.897	61.7	88.9	0.0966	0.14	<0.020	0.14	0.491	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00030	<0.00040	<0.10	<0.10	<0.10	<0.0010	36	10.6
	15-Jun-2023	8.10	**1940**	10	**8.98**	**1,760**	**1,230**	12.5	1,030	1,100	77.5	<1.0	4.2	0.482	1.84	**538**	8.35	0.793	42.2	109	0.41	0.026	<0.010	0.026	0.791	<0.00050	<0.00050	<0.00050	<0.00040	<0.00030	<0.00050	<0.00050	<0.10	<0.100	<0.10	0.0014	39	10.6
MW22A	6-Jun-2014	**9.9**	**5640**	7.4	7.83	**5300**	**4100**	-	-	940	<0.50	-	36	3.7	4.1	**1300**	11	-	**2200**	-	<0.050	**16**	-	-	1.2	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	92	5.1
	4-Jun-2015	-	-	-	8.08	**5300**	**3800**	100	790	960	<0.50	<0.50	36	3.6	4.7	**1200**	12	-	**2000**	0.93	**0.11**	**16**	0.011	16	0.99	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	49	7.0
	8-Jun-2016	7.76	**5600**	10.0	8.09	**5300**	**3800**	100	790	960	<0.50	<0.50	35	3.4	4.1	**1200**	11	-	**2000**	0.93	<0.050	**17**	<0.010	17	0.070	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	21	5.4
	7-Jun-2017	7.6	**5290**	9	8.33	**5200**	**3800**	110	780	950	2.4	<0.50	36	3.6	4.6	**1300**	13	-	**1900**	1.2	0.15	**70**	<0.033	-	-	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	36	6.7
	26-Jun-2018	7.74	**5710**	7.2	8.08	**5300**	**3800**	100	770	940	<1.0	<1.0	36	3.3	4.3	**1300**	13	-	**1900**	1.1	0.049	**14**	<0.010	14	0.88	<0.00040	<0.00040	<0.00040	-	-	<0.00089	<0.00050	-	<0.10	<0.10	0.002	67	6.8
	17-Jun-2019	7.82	**5532**	10	8.33	**5300**	**3700**	100	770	920	8.9	<1.0	35	4	4.2	**1300**	12	-	**1800**	2.2	0.074	**18**	0.019	18	0.9	<0.00040	<0.00040	<0.00040	<0.00080	<0.00040	<0.00080	<0.00050	<0.10	<0.10	<0.10	<0.0015	43	6.4
	5-Jun-2020	7.51	**5360**	9.1	8.24	**5300**	**3800**	120	730	890	<1.0	<1.0	40	4.0	4.4	**1300**	13	-	**1900**	3.5	0.24	**17**	0.033	17	0.63	<0.00040	<0.00040	<0.00040	<0.00080	<0.00040	<0.00080	<0.00050	<0.10	<0.10	<0.10	<0.0015	33	6.1
	3-Jun-2021	7.85	**4840**	11.5	8.45	**4380**	**3880**	106	778	921	14	<5.0	36.3	3.8	4.3	**1300**	10.7	0.31	**2000**	101	0.084	**12.9**	<0.050	12.9	1.4	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00071	<0.00050	<0.10	<0.10	<0.10	<0.0010	47	6.3
	10-Jun-2022	7.65	**6090**	10.7	**8.57**	**4980**	**3900**	105	852	986	26.8	<1.0	35.7	3.77	4.21	**1280**	10.7	0.34	**1980**	97.3	0.14	**13.5**	<0.050	13.5	0.76	<0.00050	<0.00050	<0.00050	<0.00050	<0.00040	<0.00050	<0.00050	<0.10	<0.10	<0.10	<0.0010	17	6.67
	16-Jun-2023	8.73	**4690**	10	**8.66**	**4,410**	**3,770**	104	713	821	24	<1.0	35.4	3.93	4.48	**1,280**	11	0.288	**1,940**	104	0.117	**11.2**	<0.100	11.2	0.621	<0.00050	<0.00050	<0.00050	<0.00040	<0.00030	<0.00050	<0.00050	<0.10	<0.100	<0.10	0.0024	20	7.08
MW23A	30-May-2014	8.5	**2250**	7.9	8.48	**2200**	**1400**	-	-	1300	28	-	5.4	0.63	1.8	**570**	17	-	110	-	**0.60**	<0.010	-	-	1.5	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	81	16
	4-Jun-2015	**8.8**	**2240**	8.9	8.44	**2100**	**1300**	12	1100	1300	17	<0.50	4.1	0.48	2.2	**500**	20	-	90	0.90	**0.76**	<0.010	<0.010	<0.010	1.1	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	55	16
	8-Jun-2016	**8.65**	**2240**	8.6	**8.53**	**2100**	**1300**	12	1100	1300	26	<0.50	4.1	0.49	2.0	**560**	18	-	85	1.0	**0.76**	<0.010	<0.010	<0.020	1.5	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	55	16
	7-Jun-2017	**8.8**	**2310**	8.5	**8.75**	**2100**	**1300**	13	1100	1300	54	<0.50	4.4	0.47	2.0	**570**	21	-	77	0.52	**0.93**	<0.044	<0.033	-	1.6	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	57	21
	26-Jun-2018	**8.6**	**2380**	6.8	**8.51**	**2200**	**1300**	12	1100	1300	31	<1.0	4.1	0.49	2.0	**560**	20	-	88	1.3	**0.79**	<0.010	<0.010	<0.020	1.5	<0.00040	<0.00040	<0.00040	-	-	<0.00089	<0.00050	<0.10	<0.10	<0.10	0.0021	67	17
	17-Jun-2019	**8.1**	**2410**	11.6	**8.70**	**2200**	**1300**	12	1100	1200	85	<1.0	4	0.54	1.8	**560**	19	-	85	0.59	**0.79**	<0.010	<0.010	<0.014	1.3	<0.00040	<0.00040	<0.00040	<0.00080	<0.00040	<0.00089	<0.00050	<0.10	<0.10	<0.10	<0.0015	59	19
	5-Jun-2020	**8.74**	**2170**	7.8	**8.63**	**2200**	**1400**	10	1000	1200	42	<1.0	3.2	0.54	1.9	**590**	19	-	120	5.3	**0.84**	<0.010	<0.010	<0.014	0.83	<0.00040	<0.00040	<0.00040	<0.00080	<0.00040	<0.00089	<0.00050	<0.10	<0.10	<0.10	<0.0015	73	14
	3-Jun-2021	**9.01**	**2020**	9.9	**8.95**	**1860**	**1360**	8.7	1120	1220	74.4	<5.0	2.7	0.5	1.85	**562**	16.7	**1.13**	102	98.4	**0.829**	0.1	<0.050	<0.11	1.38	<0.00050	<0.00050	<0.00050	<0.00050	<0.00040	<0.00050	<0.00050	<0.10	<0.10	<0.10	<0.0010	45	14.9
	10-Jun-2022	**8.76**	**2500**	10.1	**8.81**	**2060**	**1440**	10.6	1280	1430	63.8	<1.0	3.3	0.561	1.87	**537**	16	**1.41**	83.9	85.2	**0.87**	<0.040	<0.020	<0.050	1.3	<0.00050	<0.00050	<0.00050	<0.00030	<0.00040	<0.00050	<0.00050	<0.10	<0.10	<0.10	<0.0010	55	17.4
	16-Jun-2023	**9.00**	**1125**	9.8	**9.04**	**2,150**	**1,300**	11.3	1,060	1,120	85.4	<1.0	3.61	0.564	1.88	**548**	16.8	**1.2**	57.2	106	**0.966**	<0.020	<0.010	<0.0224	1.45	<0.00050	<0.00050	<0.00050	<0.00040	<0.00030	<0.00050	<0.00050	<0.10	<0.100	<0.10	0.0056	56	17.0
MW25A	6-Jun-2014	**10**	**2220**	7.1	8.28	**2000**	**1200**	-	-	1400	<0.50	-	4.7	0.49	1.9	**480**	17	-	14	-	**0.42**	0.97	-	-	1.1	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	32	7.9
	4-Jun-2015	**8.6**	**2190**	8.3	8.39	**2100**	**1200**	13	1200	1400	11	<0.50	4.6	0.44	2.3	**490**	9.2	-	13	0.91	**0.41**	0.85	**0.21**	1.1	1.1	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	35	8.1
	8-Jun-2016	8.39	**2130**	9.4	8.45	**2100**	**1300**	15	1200	1400	19	<0.50	5.1	0.47	1.8	**540**	8.4	-	4.3	1.0	**0.62**	0.18	0.029	0.21	1.2	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	29	7.9
	7-Jun-2017	8.4	**2050**	8.2	**8.55**	**2000**	**1200**	13	1200	1400	28	<0.50	4.5	0.42	1.7	**490**	8.9	-	3.1	4.6	**0.55**	2	**0.27**	0.53	1.2	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	25	9.6
	26-Jun-2018	8.5	**2320**	6.5	**8.51**	**2100**	**1300**	14	1200	1400	30	<1.0	4.7	0.45	1.8	**550**	9.4	-	<1.0	0.22	**0.76**	<0.020	<0.010	<0.020	1.2	<0.00040	<0.00040	<0.00040	-	-	<0.00089	<0.00050	-	<0.10	<0.10	0.0023	29	8.7
	17-Jun-2019	8.17	**2120**	10.8	**8.58**	**2100**	**1300**	13	1200	1300	68	<1.0	4.6	0.45	1.7	**540**	8.7	-	<1.0	0.54	**0.71**	<0.010	0.081	0.081	1.8	<0.00040	<0.00040	<0.00040	<0.00080	<0.00040	<0.00089	<0.00050	<0.10	<0.10	<0.10	<0.0015	32	10
	5-Jun-2020	8.32	**2080**	8.6	**8.51**	**2100**	**1300**	14	1100	1300	28	<1.0	4.9	0.49	2	**570**	9.3	-	2.2	5.1	**0.66**	0.52	0.10	0.62	1.2	<0.00040	<0.00040	<0.00040	<0.00080	<0.00040	<0.00080	<0.00050	<0.10	<0.10	<0.10	0.0023	23	8.8
	3-Jun-2021	8.49	**1920**	10.4	**8.77**	**1760**	**1400**	17.1	1230	1390	52.7	<5.0	5.83	0.61	2.15	**641**	7.8	0.925	1.5	114	**0.786**	0.123	0.01	0.134	0.9	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00071	<0.00050	<0.10	<0.10	<0.10	<0.0010	22	8.8
	10-Jun-2022	8.42	**2460**	10.2	**8.77**	**2040**	**1400**	14.8	1410	1600	60.8	<1.0	5.03	0.536	1.76	**520**	8.24	**1.21**	0.4	80.7	**0.541**	<0.020	<0.010	<0.050	1.2	<0.00050	<0.00050	<0.00050	<0.00030	<0.00040	<0.00050	<0.00050	<0.10	<0.10	<0.10	<0.0010	28	11.1
	16-Jun-2023	8.38	**1810**	13	**8.99**	**2,080**	**1,380**	14.8	1,300	1,400	90.7	<1.0	5.03	0.55	1.85	**565**	8.1	1.0	0.32	95	**1.1**	0.028	<0.010	0.028	1.18	<0.00050	<0.00050	<0.00050	<0.00040	<0.00030	<0.00050	<0.00050	<0.10	<0.100	<0.10	0.0012	33	10.6
MW26A	6-Jun-2014	**9.9**	**2910**	6.7	8.45	**2700**	**1800**	-	-	1000	15	-	9.5	1.4	2.4	**650**	5.9	-	**610**	-	<0.050	1.6	-	-	0.78	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	29	7.8
	4-Jun-2015	-	-	-	8.36	**2700**	**1700**	28	900	1100	8.6	<0.50	9.1	1.2	2.7	**650**	5.3	-	**520**	1.0	<0.050	0.94	<0.010	0.94	1.7	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.26	-	-	9.3
	8-Jun-2016	-	-	-	**8.53**	**2600**	**1700**	26	910	1100	23	<0.50	8.7	1.1	2.5	**640**	5.0	-	**490**	1.0	<0.050	1.0	**0.075**	1.1	1.2	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	51	10
	7-Jun-2017	-	-	-	**8.56**	**2600**	**1700**	26	900	1100	23	<0.50	8.5 *	1.2 *	2.4 *	**670** *	5.4	-	**510**	1	<0.015	**5.7**	<0.033	1.3	0.77	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	26	-
	26-Jun-2018	**8.6**	**2960**	7.0	**8.51**	**2700**	**1700**	29	910	1100	24	<1.0	9.5	1.2	2.4	**640**	5.9	-	**510**	0.78	<0.015	0.92	<0.010	0.92	1.8	<0.00040	<0.00040	<0.00040	-	-	<0.00089	<0.00050	-	<0.10	<0.10	0.002	120	9.4
	17-Jun-2019	**8.43**	**2850**	18.7	-	-	-	-	-	-	-	-	8.2	1	2.3	**650**	-	-	-	-	0.021	-	-	-	0.75	<0.00040	<0.00040	<0.00040	<0.00080	<0.00040	<0.00080	<0.00050	<0.10	<0.10	<0.10	<0.0015	39	-
	5-Jun-2020	-	-	-	**8.51**	**2600**	**1700**	27	850	990	24	<1.0	9.2	1.1	2.3	**670**	6	-	**510**	3.2	0.028	1.5	<0.010	1.5	1.6	-	-	-	-	-	-	-	-	-	-	<0.0015	66	8.9
	3-Jun-2021	Insufficient volume			**8.72**	**2290**	**1910**	34.9	909	1030	38	<5.0	11.6	1.4	3.02	**811**	4.6	0.77	**527**	123	<0.050	1.63	<0.050	1.63	0.36	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00071	<0.00050	<0.10	<0.10	<0.10	0.0039	25	11.5
	10-Jun-2022	Insufficient volume			**8.76**	**2490**	**1760**	25.8	1080	1220	50.8	<1	8.5	1.1	2.23	**586**	4.4	**1.03**	**484**	81.8	<0.0050	1.36	<0.020	1.36	0.645	<0.00050	<0.00050	<0.00050	<0.00030	<0.00040	<0.00050	<0.00050	<0.10	<0.10	<0.10	<0.0010	59	11.2
	16-Jun-2023	8.73	2410	11.8	**8.96**	**2,580**	**1,730**	26	931	1,000	66.8	<1.0	8.5	1.15	2.4	**651**	4.95	0.852	**471**	101	0.0764	0.96	<0.050	0.96	0.124	<0.00050	<0.00050	<0.00050	<0.00040	<0.00030	<0.00050	<0.00050	<0.10	<0.100	<0.10	<0.0010	40	11.8
MW27A	30-May-2014	8.3	**2890**	7.0	**8.52**	**2800**	**2000**	-	-	920	27	-	9.0	1.2	2.1	**730**	6.2	-	**770**	-	**0.97**	0.11	-	-	1.2	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	43	11
	4-Jun-2015	**8.9**	**2880**	10.3	8.38	**2900**	**1900**	26	780	930	7.5	<0.50	8.5	1.1	2.5	**690**	5.2	-	**730**	0.99	**0.63**	0.046	**0.17**	0.22	1.2	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	34	11
	8-Jun-2016	**8.62**	**2860**	6.2	**8.57**	**2800**	**1800**	25	730	850	21	<0.50	8.5	1.0	2.2	**620**	5.0	-	**710**	0.94	**0.86**	0.21	**0.071**	0.28	0.76	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	39	11
	7-Jun-2017	8.5	**2810**	8.2	**8.60**	**2900**	**1900**	26	800	920	26	<0.50	8.7	1	2.3	**700**	6.9	-	**720**	0.027	**0.86**	0.47	**0.28**	-	1.2	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	30	14
	26-Jun-2018	7.96	**3120**	6.5	8.41	**2800**	**1900**	25	790	950	11	<1.0	8.4	1	2.2	**740**	5.1	-	**700**	3.6	0.61	0.26	<0.010	0.26	1.1	<0.00040	<0.00040	<0.00040	-	-	<0.00089	<0.00050	<0.10	<0.10	<0.10	<0.0020	32	11
	17-Jun-2019	8.48	**3050**	11.8	**8.59**	**2900**	**1900**	25	790	860	49	<1.0	8.4	0.97	2.1	**700**	5.5	-	**660**	1.8	**0.66**	0.33	0.029	0.36	0.85	<0.00040	<0.00040	<0.00040	<0.00080	<0.00040	<0.00089	<0.00050	<0.10	<0.10	<0.10	<0.0015	40	13
	4-Jun-2020	8.4	**2930**	6.2	8.47	**2800**	**1900**	26	790	930	34	<1.0	8.9	0.96	2.4	**750**	5.7	-	**680**	4.7	**0.81**	0.31	0.032	0.34	0.85	<0.00040	<0.00040	<0.00040	<0.00080	<0.00040	<0.00080	<0.00050	<0.10	<0.10	<0.10	<0.0015	31	12
	2-Jun-2021	8.12	**2670**	9.5	**8.62**	**2560**	**1980**	21.1	788	908	26	<5.0	6.68	1.07	2.46	**739**	4.6	0.84	**753**	103	**0.796**	0.32	<0.050	0.32	0.81	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00071	<0.00050	<0.10	<0.10	<0.10	0.0059	34	11.1
	10-Jun-2022	7.55	**6550**	11.5	**8.74**	**2730**	**1950**	25.6	949	1070	44.2	<1.0	8.64	0.991	2.12	**622**	4.45	0.922	**714**	81.5	**0.821**	0.212	**0.116**	0.328	1.18	<0.00050	<0.00050	<0.00050	<0.00030	<0.00040	<0.00050	<0.00050	<0.10	<0.10	<0.10	<0.0010	52	13.1
	16-Jun-2023	8.54	**4600**	9.7	**8.94**	**2,830**	**1,870**	25.2	772	829	55.2	<1.0	8.49	0.979	2.31	**675**	4.63	0.815	**692**	100	**0.784**	0.165	**0.127**	0.292	1.23	<0.00050	<0.00050	<0.00050	<0.00040	<0.00030	<0.00050	<0.00050	<0.10	<0.100	<0.10	<0.0010	40	11.6

Notes:

[1] Alberta Environment and Parks (AEP). 2022. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. ISBN 978-1-4601-5501-1. Referenced guidelines are for fine textured soils under Agricultural land use

[2] Alberta Environment and Parks (AEP). Environmental Quality Guidelines for Alberta Surface Waters. March 2018. Table 1 Surface water quality guidelines for the protection of freshwater aquatic life (PAL). Most conservative values applied (chronic or acute).

[3] Guideline varies with hardness.

[4] Guideline varies with pH and temperature.

[5] Guideline varies with chloride.

[6] Guideline varies with pH.

"-" No applicable guideline or not analyzed.

BOLD - Greater than Tier 1 Guideline.

Italic - Detection limit greater than Tier 1 guideline.

* - laboratory filtered.

TETRA TECH

Table 4c: Field and Groundwater Analytical Results Summary - Clay Shale Wells

Parameter Group		Field			Routine																	Nutrients					Hydrocarbons										Organics		
	Parameter	pH	Electrical Conductivity	Temperature	pH	Electrical Conductivity	Total Dissolved Solids	Hardness	Alkalinity, total (as CaCO3)	Bicarbonate	Carbonate	Hydroxide	Calcium	Magnesium	Potassium	Sodium	Chloride	Fluoride	Sulphate	Ionic Balance	Ammonia-N	Nitrate (N)	Nitrite (N)	Nitrate and Nitrate (N)	Total Kjeldahl Nitrogen	Benzene	Toluene	Ethylbenzene	Xylenes (m & p)	Xylene (o)	Xylenes	Styrene	F1 (C6-C10)	F1-BTEX	F2 (C10-C16)	Total Phenols	Chemical Oxygen Demand	Dissolved Organic Carbon
	Unit	pH Units	µS/cm		pH Units	µS/cm	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	-	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		6.5-8.5	1000	-	6.5-8.5	1000	500	-	-	-	-	-	-	-	-	200	100	1	128-429	-	0.018-190	3	0.02-0.20	100	-	0.005	0.024	0.0016	-	-	0.02	0.072	2.2	2.2	1.1	-	-	-
Monitoring Well	Date																																						
MW28A	30-May-2014	8.4	**3630**	6.2	8.46	**3400**	**2500**	-	-	830	19	-	13	1.4	2.5	**850**	5.3	-	**1200**	-	**1.3**	0.027	-	-	1.6	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	42	9.6
	4-Jun-2015	8.4	**3590**	8.5	8.34	**3400**	**2400**	38	710	850	3.4	<0.50	13	1.3	3.1	**870**	5.0	-	**1100**	1.1	**1.1**	<0.010	0.012	0.012	1.6	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	39	8.5
	8-Jun-2016	**8.51**	**3380**	7.7	**8.54**	**3300**	**2200**	35	660	780	16	<0.50	12	1.1	2.6	**800**	5.2	-	**1000**	1.0	**1.2**	0.066	0.030	0.096	1.7	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	31	10
	7-Jun-2017	8.5	**3490**	6.7	8.47	**3300**	**2300**	36	720	850	13	<0.50	13	1.2	2.7	**810**	5.0	-	**1000**	0.99	**1.4**	0.044	<0.033	-	1.6	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	28	12
	26-Jun-2018	7.94	**3380**	8.6	8.43	**3300**	**2300**	35	720	850	15	<1.0	12	1.2	2.5	**860**	4.7	-	**1000**	3.6	1.1	0.047	0.037	0.084	1.5	<0.00040	<0.00040	<0.00040	-	-	<0.00089	<0.00050	-	<0.10	<0.10	<0.0020	31	9.0
	17-Jun-2019	8.47	**3620**	11.2	**8.57**	**3400**	**2200**	36	710	800	34	<1.0	12	1.1	2.5	**810**	5.2	-	**960**	2.4	**1.3**	0.041	0.046	0.087	1.7	<0.00040	<0.00040	<0.00040	<0.00080	<0.00040	<0.00089	<0.00050	<0.10	<0.10	<0.10	<0.0015	39	11.0
	4-Jun-2020	8.27	**3390**	8.9	8.38	**3300**	**2500**	38	660	790	6.4	<1.0	13	1.3	2.6	**850**	4.8	-	**1200**	0.65	**1.2**	0.13	0.017	0.15	1.3	<0.00040	<0.00040	<0.00040	<0.00080	<0.00040	<0.00089	<0.00050	<0.10	<0.10	<0.10	<0.0015	18	9.1
	2-Jun-2021	7.95	**3130**	8.9	**8.57**	**2980**	**2340**	37	695	807	20.3	<5.0	12.8	1.23	2.62	**813**	3.7	0.67	**1090**	98.7	**1.24**	<0.10	<0.050	<0.11	1.31	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00071	<0.00050	<0.10	<0.10	<0.10	0.003	26	10.7
	10-Jun-2022	7.41	**14000**	9.7	**8.71**	**3190**	**2290**	35.3	840	948	37.8	<1.0	12.1	1.23	2.49	**739**	3.58	0.813	**1000**	87.3	**1.11**	0.075	<0.020	0.075	1.58	<0.00050	<0.00050	<0.00050	<0.00030	<0.00040	<0.00050	<0.00050	<0.10	<0.10	<0.10	<0.0010	35	10.4
	16-Jun-2023	8.62	**3050**	8.2	**8.89**	**3,260**	**2,230**	34.9	701	756	48.8	<1.0	12	1.2	2.74	**761**	3.76	0.671	**1,010**	96.6	**1.33**	<0.100	<0.050	<0.112	1.95	<0.00050	<0.00050	<0.00050	<0.00040	<0.00030	<0.00050	<0.00050	<0.10	<0.100	<0.10	<0.0010	34	9.92
MW32A	4-Jun-2015	8.2	**8660**	7.6	8.16	**8200**	**6700**	370	790	960	<0.50	<0.50	120	15	11	**2000**	8.9	-	**4100**	0.92	**3.5**	<0.010	0.013	0.013	6.8	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	410	12
	8-Jun-2016	7.79	**7910**	8.2	8.25	**8100**	**6500**	360	800	980	<0.50	<0.50	120	15	8.4	**2000**	3.1	-	**3900**	1.0	**2.9**	<0.050	<0.050	<0.020	3.2	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	26	7.9
	7-Jun-2017	7.6	**8490**	7.3	8.12	**8000**	**6100**	350	850	1000	<0.50	<0.50	120	15	7.7	**2000**	3.2	-	**3400**	4.4	**3.2**	<0.22	**0.71**	-	3.2	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	19	7.7
	26-Jun-2018	7.51	**13,260**	11.7	8.00	**8100**	**6300**	360	840	1000	<1.0	<1.0	120	16	8.0	**2100**	2.8	-	**3500**	4.5	**2.8**	0.058	0.017	0.075	3.2	<0.00040	<0.00040	<0.00040	-	-	<0.00089	<0.00050	-	<0.10	<0.10	<0.0020	39	7.6
	12-Jun-2019	7.65	**8,100**	11.5	8.04	**8200**	**5900**	300	820	1000	<1.0	<1.0	120	<20	<30	**1900**	3.7	-	**3300**	2.8	**2.9**	<0.20	<0.20	<0.28	3.2	<0.00040	0.0011	0.00043	0.0018	0.00071	0.0026	<0.00050	<0.10	<0.10	<0.10	<0.0015	39	7.8
	29-May-2020	7.74	**8100**	8.1	8.12	**8000**	**5800**	320	670	810	<1.0	<1.0	110	12	6.5	**2000**	4.1	-	**3200**	7.6	**3.0**	0.11	**0.26**	0.37	3.1	<0.00040	<0.00040	<0.00040	<0.0008	<0.0004	<0.00089	<0.00050	<0.1	<0.10	0.28	<0.0015	26	8.9
	4-Jun-2021	7.86	**7480**	8.6	8.49	**6950**	**6420**	304	678	792	17.2	<5.0	102	11.9	6.89	**1900**	3.7	0.31	**3990**	92	**2.4**	0.34	**<0.050**	0.34	2.86	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00071	<0.00050	<0.10	<0.10	<0.10	0.0015	34	10.7
	10-Jun-2022	7.2	**9260**	9.5	8.28	**7530**	**6170**	308	798	973	<1.0	<1.0	102	13	6.97	**1860**	3.12	0.254	**3680**	94.3	**2.9**	<0.10	**<0.050**	<0.112	2.75	<0.00050	<0.00050	<0.00050	<0.00030	<0.00040	<0.00050	<0.00050	<0.10	<0.10	<0.10	<0.0010	32	11.2
	16-Jun-2023	7.88	**7740**	12.4	8.32	**7,890**	**6,260**	331	641	770	5.6	<1.0	110	13.6	7.64	**1,960**	<10.0	<0.400	**3,760**	101	**3.8**	<0.400	<0.200	<0.447	3.11	<0.00050	<0.00050	<0.00050	<0.00040	<0.00030	<0.00050	<0.00050	<0.10	<0.100	<0.10	<0.0010	26	9.5
15MW35A **	8-Jun-2016	-	-	-	**8.60**	**1500**	**930**	11	780	900	26	<0.50	3.8	0.36	2.2	**370**	36	-	41	0.95	**0.83**	<0.010	<0.010	<0.020	12	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.27	-	1100	15
	7-Jun-2017	-	-	-	**8.61**	**1600**	**950**	10	830	960	23	<0.50	3.6	0.34	3.1	**390**	36	-	21	2.4	-	<0.044	<0.033	<0.010	-	0.00049	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.27	-	-	-
	26-Jun-2018	-	-	-	8.44	**1600**	**990**	10	860	1000	16	<1.0	3.6	0.32	2.2	**410**	40	-	17	1.2	**0.33**	<0.020	<0.010	<0.020	7	0.0030	<0.00040	<0.00040	-	-	<0.00089	<0.00050	-	<0.10	-	<0.0026	310	-
	17-Jun-2019	**8.6**	**1992**	12.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.68**	-	-	-	3.7	<0.00040	<0.00040	<0.00040	<0.00080	<0.00040	<0.00089	<0.00050	<0.10	<0.10	<0.10	0.0035	140	-
	5-Jun-2020	-	-	-	8.47	**1700**	**1000**	9.7	820	960	18	<1.0	3.4	0.3	1.9	**450**	40	-	16	5.6	**0.37**	<0.010	<0.010	<0.014	3.4	-	-	-	-	-	-	-	-	-	-	-	<0.0015	-	18
	2-Jun-2021	Insufficient volume			**8.64**	**1510**	**1010**	9.1	886	1020	27.6	<5.0	3.15	0.31	2.36	**417**	38.7	**1.49**	11.8	96.6	**0.437**	<0.020	<0.010	<0.022	3.97	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00071	<0.00050	<0.10	<0.10	<0.10	<0.0010	118	18.6
	9-Jun-2022	7.41	9720	8.74	**1.91**	**11000**	**4840**	10.2	<2	<1.0	<1.0	<1.0	3.38	0.435	1.94	**482**	38.8	**1.79**	**4270**	37.3	**0.584**	<0.20	<0.10	<0.224	-	<0.00050	<0.00050	<0.00050	<0.00030	<0.00040	<0.00050	<0.00050	<0.10	<0.10	<0.10	-	164	20
	16-Jun-2023	Insufficient volume			**8.99**	**1,730**	**1,130**	14.9	903	971	64.1	<1.0	5.13	0.508	3.56	**483**	38.1	**1.55**	15.1	110	**0.375**	0.056	0.038	0.094	4.45	<0.00050	<0.00050	<0.00050	<0.00030	<0.00040	<0.00050	<0.00050	<0.10	<0.100	<0.10	0.0012	197	22.2
15MW36A	8-Jun-2016	**8.87**	**1590**	9.1	**8.66**	**1600**	**900**	12	830	970	25	<0.50	3.9	0.41	1.4	**390**	7.4	-	<1.0	1.0	**0.60**	<0.010	<0.010	<0.020	3	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	55	13
	7-Jun-2017	**8.8**	**1630**	6.5	**8.52**	**1600**	**930**	9.5	880	1000	18	<0.50	3.3	0.32	1.3	**380**	7.1	-	2.9	2.7	**0.52**	<0.044	<0.033	<0.010	1.2	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	42	14
	26-Jun-2018	**8.57**	**1609**	9.2	**8.52**	**1600**	**960**	9.3	900	1000	24	<1.0	3.2	0.33	1.4	**410**	7.1	-	<1.0	0.69	**0.63**	<0.020	<0.010	<0.020	1.0	<0.00040	<0.00040	<0.00040	-	-	<0.00089	<0.00050	-	<0.10	<0.10	<0.0020	44	13
	12-Jun-2019	**8.73**	**1680**	9.9	**8.71**	**1600**	**930**	9	890	960	58	<1.0	3.2	0.23	1.5	**380**	8.9	-	1.8	3	**0.69**	0.018	<0.010	0.018	1.0	<0.00040	<0.00040	<0.00040	<0.00080	<0.00040	<0.00089	<0.00050	<0.10	<0.10	<0.10	<0.0015	57	10
	5-Jun-2020	**8.6**	**1574**	7.8	**8.55**	**1600**	**960**	11	840	980	26	<1.0	3.6	0.42	1.4	**440**	8.2	-	<1.0	6.2	**0.6**	<0.010	<0.010	<0.014	1.4	<0.00040	<0.00040	<0.00040	<0.00080	<0.00040	<0.00080	<0.00050	<0.10	<0.10	<0.10	<0.0015	47	13
	3-Jun-2021	**8.81**	**1497**	8.1	**8.78**	**1410**	**972**	8.9	913	1030	40	<5.0	2.97	0.36	1.42	**411**	8.42	**1.61**	0.49	98.1	**0.622**	0.06	<0.010	0.06	1.0	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00071	<0.00050	<0.10	<0.10	<0.10	<0.0010	42	12.8
	10-Jun-2022	**8.93**	**1480**	7.4	**8.84**	**1550**	**1050**	8.98	1050	1170	53.2	<1.0	2.96	0.386	1.34	**377**	7.9	**2**	2.63	78.0	**0.716**	<0.020	0.012	<0.050	1.3	<0.00050	<0.00050	<0.00050	<0.00030	<0.00040	<0.00050	<0.00050	<0.10	<0.100	<0.10	<0.0010	44	17.3
	16-Jun-2023	**9.06**	**752**	19.4	**9.03**	**1,570**	**1,010**	9.02	888	944	68.5	<1.0	2.96	0.396	1.48	**438**	6.68	**1.68**	<0.30	107	**0.701**	0.022	<0.010	<0.0224	1.16	<0.00050	<0.00050	<0.00050	<0.00040	<0.00030	<0.00050	<0.00050	<0.10	<0.100	<0.10	<0.0010	48	17.1
19MW37A	15-Nov-2019	8.10	3240	1.0	8.06	**3000**	**2100**	130	870	1100	<1.0	<1.0	32	12	5.5	**770**	8.0	-	**730**	5.5	0.69	0.029	<0.010	0.029	1.3	<0.00040	<0.00040	<0.00040	<0.00080	<0.00040	<0.00089	-	<0.10	<0.10	<0.10	<0.0013	62	10
	4-Jun-2020	8.14	3900	6.5	8.38	**3800**	**2600**	100	710	850	8.2	<1.0	29	9.1	4.9	**960**	6.3	-	**1200**	5.4	1.3	<0.010	<0.010	<0.014	1.5	<0.00040	<0.00040	<0.00040	<0.0008	<0.0004	<0.00089	<0.00050	<0.1	<0.10	<0.10	<0.0014	41	11
	15-May-2023	8.05	3730	8.7	**8.62**	**3,480**	**2,490**	59.1	732	844	23.9	<1.0	17.8	3.55	3.27	**840**	4.33	0.545	**1,150**	97.9	1.42	<0.100	<0.050	<0.112	1.89	<0.00050	<0.00050	<0.00050	<0.00040	<0.00030	<0.00050	<0.00050	<0.10	<0.100	<0.10	0.0046	-	12.7
23MW38A	21-Dec-2023	**8.52**	**2060**	5.9	**8.67**	**1,780**	**1,260**	38.8	926	1060	34.1	<1.0	11.3	2.57	3.74	**499**	21.3	**1.34**	133	103	**0.706**	0.125	<0.050	0.125	1.21	<0.00050	<0.00050	<0.00050	<0.00030	<0.00040	<0.00050	<0.00050	<0.10	<0.100	<0.10	<0.0010	-	25.2

Notes:

[1] Alberta Environment and Parks (AEP). 2022. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. ISBN 978-1-4601-5501-1. Referenced guidelines are for fine textured soils under Agricultural land use

[2] Alberta Environment and Parks (AEP). Environmental Quality Guidelines for Alberta Surface Waters. March 2018. Table 1 Surface water quality guidelines for the protection of freshwater aquatic life (PAL). Most conservative values applied (chronic or acute).

[3] Guideline varies with hardness.

[4] Guideline varies with pH and temperature.

[5] Guideline varies with chloride.

[6] Guideline varies with pH.

* No applicable guideline or not analyzed.

BOLD - Greater than Tier 1 Guideline.

Italic - Detection limit greater than Tier 1 guideline.

* - laboratory filtered.

** - Data is unreliable for 2022.

TETRA TECH

Table 4c: Field and Groundwater Analytical Results Summary - Clay Shale Wells

Parameter Group: Dissolved Metals

Monitoring Well	Date	Aluminum	Antimony	Arsenic	Barium	Beryllium	Bismuth	Boron	Cadmium	Cesium	Chromium	Cobalt	Copper
	Unit	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		0.007-0.05	0.006	0.005	1	-	-	1.0	0.00004-0.00037	-	0.05	-	0.007
MW1B	6-Jun-2014	-	<0.00060	-	0.039	-	-	-	<0.000025	-	0.0034	-	0.0057
	28-May-2015	0.0044	<0.00060	0.0012	0.017	-	-	0.63	0.000029	-	<0.0010	-	0.0020
	8-Jun-2016	**0.061**	<0.00060	0.0015	0.021	-	-	0.62	0.000029	-	<0.0010	-	0.0035
	7-Jun-2017	**0.059**	<0.00060	0.00098	0.024	-	-	0.64	0.000022	-	<0.0010	-	0.0018
	26-Jun-2018	0.003	<0.00060	0.0012	0.03	-	-	0.72	<0.00002	-	<0.0010	-	0.0021
	12-Jun-2019	0.034	<0.00060	0.00092	0.036	<0.0010	-	0.73	<0.000020	-	<0.0010	0.00037	0.00075
	5-Jun-2020	**0.25**	<0.00060	0.0013	0.049	<0.001	-	0.72	0.000027	-	<0.0010	0.00069	0.0065
	4-Jun-2021	**0.0366**	<0.00020	0.00099	0.0356	<0.00020	<0.00010	0.588	0.000021	0.000058	<0.00020	<0.00020	0.00234
	10-Jun-2022	**0.0022**	0.00045	0.00124	0.0376	<0.000040	<0.00010	0.627	0.0000366	0.00004	<0.0010	0.0005	0.00079
	15-Jun-2023	0.0096	<0.00050	0.00144	0.0505	<0.000100	<0.000250	0.678	0.000041	0.00005	<0.00050	<0.00050	0.0017
MW8A	30-May-2014	-	<0.00060	-	0.041	-	-	-	<0.000025	-	<0.0010	-	0.00047
	28-May-2015	0.0043	<0.00060	0.0014	0.025	-	-	0.68	<0.000020	-	<0.0010	-	0.00064
	8-Jun-2016	0.0093	<0.00060	0.0021	0.045	-	-	0.72	<0.000020	-	<0.0010	-	0.00042
	7-Jun-2017	0.0088	<0.00060	0.0019	0.049	-	-	0.77	<0.000020	-	<0.0010	-	<0.00020
	26-Jun-2018	0.0079	<0.00060	0.0027	0.044	-	-	0.73	<0.00002	-	<0.0010	-	0.00055
	12-Jun-2019	0.0050	<0.00060	0.0032	0.05	<0.0010	-	0.76	<0.000020	-	<0.0010	0.00036	0.00097
	29-May-2020	0.0041	<0.00060	0.0039	0.040	<0.001	-	0.67	<0.000020	-	<0.0010	0.00037	0.00058
	4-Jun-2021	0.0170	<0.00020	0.00435	0.046	<0.00020	<0.00010	0.635	<0.000010	0.000046	<0.00020	0.0003	0.00056
	10-Jun-2022	0.0066	<0.00020	**0.0051**	0.052	<0.000040	<0.00010	0.588	<0.000010	0.000038	<0.0010	0.0003	<0.00040
	15-Jun-2023	0.0103	<0.00050	0.00444	0.0523	<0.000100	<0.000250	0.712	<0.0000250	<0.000050	<0.00050	<0.00050	<0.00100
MW12B	30-May-2014	-	<0.0060	-	<0.10	-	-	-	<0.000050	-	<0.010	-	<0.0020
	28-May-2015	*<0.060*	*<0.012*	<0.0040	<0.10	-	-	0.56	<0.00040	-	<0.020	-	<0.0040
	8-Jun-2016	<0.0030	<0.00060	0.00088	<0.010	-	-	0.57	0.000027	-	<0.0010	-	0.0023
	7-Jun-2017	0.0037	<0.00060	0.00067	<0.10	-	-	0.55	<0.000020	-	<0.0010	-	0.0015
	26-Jun-2018	<0.003	<0.00060	0.00066	<0.10	-	-	0.59	<0.00002	-	<0.0010	-	0.0027
	12-Jun-2019	<0.0030	<0.00060	0.00086	<1.0	<0.0010	-	0.6	<0.000020	-	<0.0010	0.00043	0.0041
	4-Jun-2020	<0.0030	<0.00060	0.00075	<0.010	<0.001	-	0.45	<0.000020	-	<0.0010	0.00032	0.0018
	4-Jun-2021	0.216	<0.00050	0.00068	0.02	<0.00050	<0.00025	0.62	<0.000025	0.000155	<0.00050	<0.00050	0.0024
	10-Jun-2022	<0.0050	<0.00050	0.00064	0.016	<0.00010	<0.00025	0.55	<0.000025	0.000123	<0.0025	<0.00050	0.00255
	15-May-2023	**0.256**	<0.00100	<0.00100	0.0202	<0.000200	<0.000500	0.694	<0.0000500	0.000117	<0.00500	0.00213	<0.00200
MW18A	30-May-2014	-	<0.00060	-	<0.10	-	-	-	<0.000025	-	<0.0010	-	0.00057
	28-May-2015	0.0046	<0.00060	0.0010	0.089	-	-	0.78	<0.000020	-	<0.0010	-	0.00025
	8-Jun-2016	0.029	<0.00060	0.00092	0.091	-	-	0.81	<0.000020	-	<0.0010	-	0.00023
	7-Jun-2017	0.0045	<0.00060	0.001	0.1	-	-	0.83	<0.000020	-	<0.0010	-	0.00038
	26-Jun-2018	0.0074	<0.00060	0.0013	0.1	-	-	0.83	<0.00002	-	<0.0010	-	<0.00020
	12-Jun-2019	<0.0030	<0.00060	0.001	0.1	<0.0010	-	0.85	<0.000020	-	<0.0010	<0.00030	0.00066
	4-Jun-2020	<0.0030	<0.00060	0.0013	0.08	<0.001	-	0.81	<0.000020	-	<0.0010	<0.0003	0.0039
	4-Jun-2021	0.003	<0.00010	0.0014	0.10	<0.00010	<0.000050	0.779	<0.0000050	0.000018	<0.00010	0.00013	<0.00020
	10-Jun-2022	0.0024	0.00024	0.00173	0.0954	<0.000020	<0.000050	0.67	0.0000051	0.000013	<0.00050	0.00012	0.00114
	15-Jun-2023	0.002	0.00011	0.00179	0.0918	<0.000020	<0.000050	0.761	<0.0000050	0.000013	<0.00050	0.0001	0.00045
MW19A	30-May-2014	-	<0.0060	-	<0.10	-	-	-	**0.000055**	-	<0.010	-	<0.0020
	28-May-2015	<0.030	<0.0060	<0.0020	<0.010	-	-	0.40	<0.00020	-	<0.010	-	<0.0020
	8-Jun-2016	0.0072	<0.00060	0.00065	<0.010	-	-	0.41	0.000039	-	<0.0010	-	0.0014
	7-Jun-2017	<0.0030	<0.00060	0.00054	<0.10	-	-	0.43	<0.000020	-	<0.0010	-	0.00041
	26-Jun-2018	<0.003	<0.00060	0.00056	<0.10	-	-	0.47	<0.00002	-	<0.0010	-	0.00022
	12-Jun-2019	<0.0030	<0.00060	0.00056	<1.0	<0.0010	-	0.45	<0.000020	-	<0.0010	0.00042	0.00078
	4-Jun-2020	<0.0030	<0.00060	0.00091	0.026	<0.001	-	0.41	<0.000020	-	<0.0010	0.0011	0.0011
	4-Jun-2021	0.002	0.00057	0.00082	0.0167	<0.00010	<0.00005	0.411	<0.0000050	0.000047	<0.00010	0.00049	<0.00020
	10-Jun-2022	<0.0050	<0.00050	0.00109	0.015	<0.00010	<0.00025	0.402	<0.000025	<0.000050	<0.0025	<0.00050	<0.0010
	15-Jun-2023	<0.0100	<0.00100	<0.00100	0.0114	<0.000200	<0.000500	0.523	<0.0000500	<0.000100	<0.00100	<0.00100	<0.00200
MW20A	30-May-2014	-	<0.00060	-	0.025	-	-	-	<0.000025	-	0.0019	-	0.0036
	28-May-2015	0.0052	<0.00060	0.00037	0.015	-	-	0.80	<0.000020	-	<0.0010	-	0.00075
	8-Jun-2016	0.0040	<0.00060	0.00051	0.018	-	-	0.92	<0.000020	-	<0.0010	-	0.00038
	7-Jun-2017	0.0078	<0.00060	0.00040	0.027	-	-	0.79	<0.000020	-	<0.0010	-	0.00031
	26-Jun-2018	0.0040	<0.00060	0.00040	0.022	-	-	0.88	<0.00002	-	<0.0010	-	0.00088
	12-Jun-2019	0.020	<0.00060	0.00042	0.023	<0.0010	-	0.88	<0.000020	-	<0.0010	<0.00030	0.00076
	4-Jun-2020	<0.0030	<0.00060	0.00033	0.020	<0.001	-	0.69	<0.000020	-	<0.0010	<0.0003	0.00030
	3-Jun-2021	<0.0050	<0.00050	<0.00050	0.028	<0.00050	<0.00025	0.87	<0.000025	<0.000050	<0.00050	<0.00050	0.00140
	10-Jun-2022	0.005	<0.00020	0.00039	0.022	<0.000040	<0.00010	0.625	<0.000010	0.000031	<0.0010	<0.00020	0.00124
	15-Jun-2023	<0.0050	<0.00050	<0.00050	0.0264	<0.000100	<0.000250	0.724	<0.0000250	<0.000050	<0.00050	<0.00050	0.00136

Monitoring Well	Date	Iron	Lead	Lithium	Manganese	Mercury	Molybdenum	Nickel	Phosphorus	Rubidium	Selenium	Silicon	Silver
	Unit	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		0.3	0.001-0.007	-	0.05	0.000005	-	0.007-0.17	-	-	0.002	-	0.0001
MW1B	6-Jun-2014	**0.64**	0.00056	-	-	**0.00003**	-	0.0068	-	-	-	-	-
	28-May-2015	<0.060	<0.00020	-	**0.10**	<0.0000050	-	0.0038	-	-	<0.00020	-	<0.00010
	8-Jun-2016	<0.060	<0.00020	-	**0.057**	<0.0000020	-	0.0060	-	-	0.00058	-	<0.00010
	7-Jun-2017	<0.060	<0.00020	-	**0.095**	<0.0000020	-	0.0056	-	-	0.00035	-	<0.00010
	26-Jun-2018	<0.06	<0.00020	-	0.027	0.0000021	-	0.0044	-	-	0.00023	-	<0.00010
	12-Jun-2019	<0.060	<0.00020	0.12	**0.075**	<0.0000020	0.0069	0.0037	<0.10	-	0.00021	2.9	<0.00010
	5-Jun-2020	**0.62**	0.00063	0.14	**0.10**	**0.000132**	0.0052	0.0048	<0.1	-	<0.00020	3.5	<0.00010
	4-Jun-2021	**0.025**	<0.00010	0.114	**0.05**	<0.0000050	0.00477	0.0038	<0.10	0.00339	<0.00010	2.65	<0.000020
	10-Jun-2022	**<0.060**	<0.00010	0.115	**0.13**	-	0.00605	0.00593	<0.10	0.00312	0.000189	3.12	<0.000020
	15-Jun-2023	<0.050	<0.000250	0.126	**0.0584**	<0.0000050	0.00782	0.00684	<0.250	0.00375	<0.000250	3.2	<0.000050
MW8A	30-May-2014	**0.31**	<0.00020	-	-	<0.0000050	-	0.0023	-	-	-	-	-
	28-May-2015	<0.060	<0.00020	-	0.017	<0.0000050	-	0.0020	-	-	<0.00020	-	<0.00010
	8-Jun-2016	<0.060	<0.00020	-	0.015	<0.0000020	-	0.0023	-	-	<0.00020	-	<0.00010
	7-Jun-2017	<0.060	<0.00020	-	0.025	<0.0000020	-	0.0011	-	-	<0.00020	-	<0.00010
	26-Jun-2018	<0.06	<0.00020	-	0.042	0.0000025	-	0.0012	-	-	<0.00020	-	<0.00010
	12-Jun-2019	<0.060	<0.00020	0.12	**0.10**	<0.0000020	0.0071	0.001	0.15	-	<0.00020	4	<0.00010
	29-May-2020	<0.060	<0.00020	0.099	**0.08**	<0.0000019	0.0089	0.0008	<0.1	-	<0.00020	3.5	<0.00010
	4-Jun-2021	<0.020	<0.00010	0.105	**0.09**	<0.0000050	0.00772	<0.0010	0.16	0.00282	<0.00010	3.4	<0.000020
	10-Jun-2022	<0.060	<0.00010	0.104	**0.08**	-	0.00819	<0.0010	0.172	0.00303	<0.00010	3.9	<0.000020
	15-Jun-2023	<0.050	<0.000250	0.116	**0.105**	<0.0000050	0.00914	<0.00250	<0.250	0.00318	<0.000250	3.85	<0.000050
MW12B	30-May-2014	*<0.60*	<0.0020	-	-	<0.0000050	-	<0.0050	-	-	-	-	-
	28-May-2015	*<0.60*	<0.0040	-	**0.43**	<0.0000050	-	<0.010	-	-	<0.0040	-	*<0.0020*
	8-Jun-2016	0.13	0.00021	-	**0.36**	<0.0000020	-	0.0030	-	-	0.00029	-	<0.00010
	7-Jun-2017	*<0.6*	<0.00020	-	**0.42**	<0.0000020	-	0.0012	-	-	<0.00020	-	<0.00010
	26-Jun-2018	*<0.6*	<0.00020	-	**0.3**	<0.000002	-	0.0022	-	-	0.00022	-	<0.00010
	12-Jun-2019	*<0.60*	<0.00020	<2.0	**0.39**	<0.0000020	0.00078	0.0032	<10	-	0.00037	<10	<0.00010
	4-Jun-2020	0.081	<0.00020	0.5	**0.31**	<0.0000019	0.00079	0.0012	<0.1	-	0.00024	4.1	<0.00010
	4-Jun-2021	0.196	<0.00025	0.566	**0.146**	<0.0000050	0.00152	0.0059	<0.25	0.0153	<0.00025	4.25	<0.000050
	10-Jun-2022	<0.15	<0.00025	0.514	**0.113**	-	0.00132	0.0039	<0.25	0.0149	<0.00025	4.04	<0.000050
	15-May-2023	0.216	<0.000500	0.468	**0.322**	<0.0000050	0.0183	0.0795	<0.500	0.0132	<0.000500	4.33	<0.000100
MW18A	30-May-2014	*<0.60*	0.00033	-	-	<0.0000050	-	0.0044	-	-	-	-	-
	28-May-2015	<0.060	<0.00020	-	0.045	<0.0000050	-	0.0039	-	-	<0.00020	-	<0.00010
	8-Jun-2016	0.11	<0.00020	-	**0.059**	<0.0000020	-	0.0035	-	-	<0.00020	-	<0.00010
	7-Jun-2017	<0.060	<0.00020	-	0.040	<0.0000020	-	0.0024	-	-	<0.00020	-	<0.00010
	26-Jun-2018	<0.06	<0.00020	-	0.049	<0.000002	-	0.0025	-	-	<0.00020	-	<0.00010
	12-Jun-2019	<0.060	<0.00020	0.073	0.034	<0.0000020	0.0041	0.0021	<0.10	-	<0.00020	3.4	<0.00010
	4-Jun-2020	<0.060	<0.00020	0.072	0.049	<0.0000019	0.0078	0.0022	<0.1	-	<0.00020	3.7	<0.00010
	4-Jun-2021	0.027	<0.000050	0.0836	0.0368	<0.0000050	0.00522	0.00113	0.093	0.0021	<0.000050	3.62	<0.000010
	10-Jun-2022	0.064	0.000666	0.0708	0.0376	-	0.0056	0.00193	0.062	0.00215	<0.000050	3.89	<0.000010
	15-Jun-2023	0.124	0.00016	0.0781	0.0326	<0.0000050	0.00615	0.00097	0.118	0.0023	<0.000050	3.98	<0.000010
MW19A	30-May-2014	*<0.60*	<0.0020	-	-	<0.0000050	-	<0.0050	-	-	-	-	-
	28-May-2015	<0.060	<0.0020	-	**0.39**	<0.0000050	-	<0.0050	-	-	<0.0020	-	*<0.0010*
	8-Jun-2016	<0.060	<0.00020	-	**0.36**	<0.0000020	-	0.0028	-	-	<0.00020	-	<0.00010
	7-Jun-2017	*<0.60*	<0.00020	-	**0.40**	<0.0000020	-	0.0017	-	-	<0.00020	-	<0.00010
	26-Jun-2018	*<0.6*	<0.00020	-	**0.71**	<0.000002	-	0.0029	-	-	<0.00020	-	<0.00010
	12-Jun-2019	*<0.60*	<0.00020	<2.0	**0.4**	<0.0000020	0.0023	0.0015	<10	-	<0.00020	<10	<0.00010
	4-Jun-2020	0.12	<0.00020	0.44	**0.53**	<0.0000019	0.0036	0.0037	<0.1	-	<0.00020	4	<0.00010
	4-Jun-2021	<0.010	<0.000050	0.58	**0.30**	<0.0000050	0.0028	0.00276	<0.050	0.00819	0.000098	4.68	<0.000010
	10-Jun-2022	<0.15	<0.00025	0.464	**0.27**	-	0.00532	0.0034	<0.25	0.00761	<0.00025	4.7	<0.000050
	15-Jun-2023	<0.100	<0.000500	0.536	**0.255**	<0.0000050	0.00536	<0.00500	<0.500	0.00785	<0.000500	4.27	<0.000100
MW20A	30-May-2014	**0.44**	0.0003	-	-	<0.0000050	-	0.0031	-	-	-	-	-
	28-May-2015	<0.060	<0.00020	-	0.026	<0.0000050	-	0.0015	-	-	<0.00020	-	<0.00010
	8-Jun-2016	<0.060	<0.00020	-	0.026	<0.0000020	-	0.0011	-	-	0.0014	-	<0.00010
	7-Jun-2017	<0.060	<0.00020	-	0.031	<0.0000020	-	0.0014	-	-	<0.00020	-	<0.00010
	26-Jun-2018	<0.06	<0.00020	-	0.016	0.000002	-	0.0012	-	-	<0.00020	-	<0.00010
	12-Jun-2019	<0.060	<0.00020	0.24	0.011	<0.0000020	0.0014	0.001	<0.10	-	<0.00020	3	<0.00010
	4-Jun-2020	<0.060	<0.00020	0.26	**0.089**	<0.0000019	0.0016	0.0010	<0.1	-	<0.00020	3.1	<0.00010
	3-Jun-2021	<0.050	<0.00025	0.333	**0.0185**	<0.0000050	0.00135	<0.0025	<0.25	0.0078	<0.00025	3.9	<0.000050
	10-Jun-2022	<0.060	<0.00010	0.268	**0.0864**	-	0.00124	0.0023	<0.10	0.00708	<0.00010	3.5	<0.000020
	15-Jun-2023	<0.050	<0.000250	0.299	**0.0362**	<0.0000050	0.00133	<0.00250	<0.250	0.00684	<0.000250	3.21	<0.000050

Monitoring Well	Date	Strontium	Sulphur	Tellurium	Thallium	Thorium	Tin	Titanium	Tungsten	Uranium	Vanadium	Zinc	Zirconium
	Unit	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		-	-	-	-	-	-	-	-	0.01	-	0.03	-
MW1B	6-Jun-2014	-	-	-	-	-	-	-	-	-	-	0.0034	-
	28-May-2015	-	-	-	-	-	-	-	-	0.0019	-	<0.0030	-
	8-Jun-2016	-	-	-	-	-	-	-	-	0.0022	-	<0.0030	-
	7-Jun-2017	-	-	-	-	-	-	-	-	0.0020	-	<0.0030	-
	26-Jun-2018	-	-	-	-	-	-	-	-	0.0018	-	<0.0030	-
	12-Jun-2019	0.17	110	-	<0.00020	-	<0.0010	0.001	-	0.0016	<0.0010	<0.0030	-
	5-Jun-2020	0.21	150	-	<0.0002	-	<0.001	0.005	-	0.0015	0.0028	<0.0030	-
	4-Jun-2021	0.165	118	<0.00040	<0.000020	<0.00020	<0.00020	0.00064	<0.00020	0.00124	<0.0010	0.0209	0.00074
	10-Jun-2022	0.149	73	<0.00040	<0.000020	<0.00020	<0.00020	<0.00060	<0.00020	0.00147	<0.0010	<0.0020	0.00102
	15-Jun-2023	0.161	51.8	<0.00100	<0.000050	<0.00050	<0.00050	<0.00150	<0.00050	0.00128	<0.00250	<0.0050	<0.00100
MW8A	30-May-2014	-	-	-	-	-	-	-	-	-	-	0.007	-
	28-May-2015	-	-	-	-	-	-	-	-	0.00071	-	<0.0030	-
	8-Jun-2016	-	-	-	-	-	-	-	-	0.00092	-	<0.0030	-
	7-Jun-2017	-	-	-	-	-	-	-	-	0.00074	-	<0.0030	-
	26-Jun-2018	-	-	-	-	-	-	-	-	0.00056	-	<0.0030	-
	12-Jun-2019	0.22	150	-	<0.00020	-	<0.0010	<0.0010	-	0.00055	0.0014	<0.0030	-
	29-May-2020	0.16	71	-	<0.0002	-	<0.001	<0.001	-	0.00050	<0.001	<0.0030	-
	4-Jun-2021	0.15	77.9	<0.00040	<0.000020	<0.00020	<0.00020	<0.00060	0.00027	0.00045	<0.0010	0.0164	0.00146
	10-Jun-2022	0.16	72.4	<0.00040	<0.000020	<0.00020	<0.00020	<0.00060	0.00028	0.00050	<0.0010	<0.0020	0.00142
	15-Jun-2023	0.176	79.4	<0.00100	<0.000050	<0.00050	<0.00050	<0.00150	<0.00050	0.000456	<0.00250	<0.0050	0.00143
MW12B	30-May-2014	-	-	-	-	-	-	-	-	-	-	<0.030	-
	28-May-2015	-	-	-	-	-	-	-	-	**0.019**	-	*<0.060*	-
	8-Jun-2016	-	-	-	-	-	-	-	-	**0.021**	-	0.0061	-
	7-Jun-2017	-	-	-	-	-	-	-	-	**0.025**	-	<0.0030	-
	26-Jun-2018	-	-	-	-	-	-	-	-	**0.018**	-	<0.0030	-
	12-Jun-2019	7.2	2300	-	<0.00020	-	<0.0010	<0.0010	-	**0.048**	<0.0010	0.0033	-
	4-Jun-2020	4.4	2000	-	<0.0002	-	<0.001	<0.001	-	**0.050**	<0.001	<0.0030	-
	4-Jun-2021	4.42	1950	<0.0010	<0.000050	<0.00050	<0.00050	0.0051	<0.00050	**0.0186**	<0.0025	0.019	<0.0010
	10-Jun-2022	4.12	1790	<0.0010	<0.000050	<0.00050	<0.00050	<0.0015	<0.00050	**0.0184**	<0.0025	<0.0050	<0.0015
	15-May-2023	2.95	1,470	<0.00200	<0.000100	<0.00100	<0.00100	0.00809	<0.00100	**0.015**	<0.00500	<0.0100	<0.00200
MW18A	30-May-2014	-	-	-	-	-	-	-	-	-	-	0.0033	-
	28-May-2015	-	-	-	-	-	-	-	-	0.00026	-	<0.0030	-
	8-Jun-2016	-	-	-	-	-	-	-	-	0.00013	-	<0.0030	-
	7-Jun-2017	-	-	-	-	-	-	-	-	0.00026	-	<0.0030	-
	26-Jun-2018	-	-	-	-	-	-	-	-	0.00029	-	<0.0030	-
	12-Jun-2019	0.063	0.2	-	<0.00020	-	<0.0010	<0.0010	-	0.0003	<0.0010	<0.0030	-
	4-Jun-2020	0.063	0.39	-	<0.0002	-	<0.001	<0.001	-	0.0001	<0.001	<0.0030	-
	4-Jun-2021	0.0658	<0.5	<0.00020	<0.000010	<0.00010	<0.00010	<0.00030	0.00036	0.000194	<0.00050	0.019	0.00068
	10-Jun-2022	0.0657	<0.50	<0.00020	<0.000010	<0.00010	<0.00010	<0.00030	0.00042	0.000097	<0.00050	0.0014	0.00058
	15-Jun-2023	0.0696	<0.50	<0.00020	<0.000010	0.00024	<0.00010	<0.00030	0.00046	0.000062	<0.00050	<0.0010	0.00084
MW19A	30-May-2014	-	-	-	-	-	-	-	-	-	-	<0.030	-
	28-May-2015	-	-	-	-	-	-	-	-	0.005	-	<0.030	-
	8-Jun-2016	-	-	-	-	-	-	-	-	0.006	-	0.0082	-
	7-Jun-2017	-	-	-	-	-	-	-	-	0.006	-	<0.0030	-
	26-Jun-2018	-	-	-	-	-	-	-	-	0.006	-	<0.0030	-
	12-Jun-2019	<2.0	1000	-	<0.00020	-	<0.0010	<0.0010	-	0.007	<0.0010	<0.0030	-
	4-Jun-2020	1.3	950	-	<0.0002	-	<0.001	<0.001	-	0.0075	<0.001	<0.0030	-
	4-Jun-2021	1.51	1270	<0.00020	0.000014	<0.00010	<0.00010	<0.00030	<0.00010	0.0082	<0.00050	0.0181	0.00101
	10-Jun-2022	1.34	1020	<0.0010	<0.000050	<0.00050	<0.00050	<0.0015	<0.00050	0.0061	<0.0025	<0.0050	<0.0015
	15-Jun-2023	1.39	1,070	<0.00200	<0.000100	<0.00100	<0.00100	<0.00300	<0.00100	0.00588	<0.00500	<0.0100	<0.00200
MW20A	30-May-2014	-	-	-	-	-	-	-	-	-	-	0.0036	-
	28-May-2015	-	-	-	-	-	-	-	-	0.0015	-	<0.0030	-
	8-Jun-2016	-	-	-	-	-	-	-	-	0.0016	-	<0.0030	-
	7-Jun-2017	-	-	-	-	-	-	-	-	0.0015	-	<0.0030	-
	26-Jun-2018	-	-	-	-	-	-	-	-	0.0015	-	<0.0030	-
	12-Jun-2019	0.42	270	-	<0.00020	-	<0.0010	<0.0010	-	0.0016	<0.0010	<0.0030	-
	4-Jun-2020	0.6	300	-	<0.0002	-	<0.001	<0.001	-	0.0017	<0.001	<0.0030	-
	3-Jun-2021	0.676	465	<0.0010	<0.000050	<0.00050	<0.00050	<0.0015	<0.00050	0.00189	<0.0025	0.0279	<0.0010
	10-Jun-2022	0.602	396	<0.00040	<0.000020	<0.00020	<0.00020	<0.00060	<0.00020	0.00163	<0.0010	<0.0020	0.00063
	15-Jun-2023	0.714	440	<0.00100	<0.000050	<0.00050	<0.00050	<0.00150	<0.00050	0.00152	<0.00250	<0.0050	<0.00100

Notes:

[1] Alberta Environment and Parks (AEP). 2022. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. ISBN 978-1-4601-5501-1. Referenced guidelines are for fine textured soils under Agricultural land use

[2] Alberta Environment and Parks (AEP). Environmental Quality Guidelines for Alberta Surface Waters. March 2018. Table 1 Surface water quality guidelines for the protection of freshwater aquatic life (PAL). Most conservative values applied (chronic or acute).

[3] Guideline varies with hardness.

[4] Guideline varies with pH and temperature.

[5] Guideline varies with chloride.

[6] Guideline varies with pH.

"-" No applicable guideline or not analyzed.

BOLD - Greater than Tier 1 Guideline.

Italic - Detection limit greater than Tier 1 guideline.

* - laboratory filtered.

TETRA TECH

Table 4c: Field and Groundwater Analytical Results Summary - Clay Shale Wells

Parameter Group: Dissolved Metals

Monitoring Well	Date	Aluminum	Antimony	Arsenic	Barium	Beryllium	Bismuth	Boron	Cadmium	Cesium	Chromium	Cobalt
	Unit	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		0.007-0.05	0.006	0.005	1	-	-	1.0	0.00004-0.00037	-	0.05	-
MW21A	6-Jun-2014	-	<0.00060	-	0.073	-	-	-	0.000034	-	0.0014	-
	4-Jun-2015	0.0058	<0.00060	0.00093	0.062	-	-	0.83	**0.000067**	-	<0.0010	-
	8-Jun-2016	0.0047	<0.00060	0.0010	0.073	-	-	0.93	**0.000079**	-	<0.0010	-
	7-Jun-2017	0.0043	<0.00060	0.0011	0.096	-	-	0.82	**0.000099**	-	<0.0010	-
	26-Jun-2018	<0.003	<0.00060	0.0012	0.081	-	-	0.90	**0.00012**	-	<0.0010	-
	17-Jun-2019	**0.058**	0.00065	0.0011	0.09	<0.0010	-	0.85	**0.00014**	-	<0.0010	<0.00030
	5-Jun-2020	0.0038	<0.00060	0.00078	0.070	<0.001	-	0.89	**0.00027**	-	<0.0010	<0.0003
	3-Jun-2021	0.0289	<0.00050	0.00273	0.117	<0.00050	<0.00025	0.935	**0.000209**	<0.000050	<0.00050	0.0015
	10-Jun-2022	0.0164	0.00034	0.00187	0.086	<0.000020	<0.000050	0.731	**0.000141**	0.00003	<0.00050	0.0006
	15-Jun-2023	0.0016	<0.00010	0.00458	0.084	<0.000020	<0.000050	0.828	**0.000134**	0.000032	<0.00050	0.00133
MW22A	6-Jun-2014	-	<0.00060	-	0.014	-	-	-	**0.000059**	-	<0.0010	-
	4-Jun-2015	<0.030	<0.0060	<0.0020	<0.010	-	-	0.82	*<0.00020*	-	<0.010	-
	8-Jun-2016	0.0047	<0.00060	0.00033	<0.10	-	-	0.85	0.000026	-	<0.0010	-
	7-Jun-2017	0.0058	<0.00060	0.0003	<0.10	-	-	0.9	0.000058	-	<0.0010	-
	26-Jun-2018	<0.003	<0.00060	0.00028	<0.10	-	-	0.84	0.000047	-	<0.0010	-
	17-Jun-2019	0.004	<0.00060	<0.00020	<0.10	<0.0010	-	0.88	**0.00017**	-	0.0014	<0.00030
	5-Jun-2020	<0.0030	<0.00060	0.00029	<0.010	<0.001	-	0.86	**0.00034**	-	<0.0010	<0.0003
	3-Jun-2021	0.0087	<0.00050	<0.00050	0.00976	<0.00050	<0.00025	0.815	**0.000193**	0.000076	0.00055	<0.00050
	10-Jun-2022	**0.198**	<0.00050	<0.00050	0.0103	<0.00010	<0.00025	0.872	**0.000175**	0.000126	<0.0025	<0.00050
	16-Jun-2023	<0.0050	<0.00050	<0.00050	0.00816	<0.000100	<0.000250	0.892	**0.000532**	0.000105	<0.00050	<0.00050
MW23A	30-May-2014	-	0.00082	-	0.040	-	-	-	**0.000075**	-	<0.0010	-
	4-Jun-2015	0.0043	<0.00060	**0.0065**	0.038	-	-	0.77	<0.000020	-	<0.0010	-
	8-Jun-2016	0.0049	<0.00060	**0.0058**	0.050	-	-	0.88	<0.000020	-	<0.0010	-
	7-Jun-2017	0.010	0.0013	0.009	0.063	-	-	0.85	<0.000020	-	<0.0010	-
	26-Jun-2018	<0.003	<0.00060	**0.0056**	0.058	-	-	0.87	0.000026	-	<0.0010	-
	17-Jun-2019	0.016	<0.00060	**0.0057**	0.061	<0.0010	-	0.82	<0.000020	-	<0.0010	<0.00030
	5-Jun-2020	0.0054	<0.00060	**0.0064**	0.055	<0.001	-	0.86	<0.000020	-	<0.001	<0.0003
	3-Jun-2021	0.0247	<0.00050	**0.0047**	0.0495	<0.00050	<0.00025	0.801	<0.000025	<0.000050	<0.00050	<0.00050
	10-Jun-2022	**0.332**	0.00042	**0.00867**	0.0634	<0.000040	<0.00010	0.799	0.0000444	0.000045	<0.0010	<0.00020
	16-Jun-2023	0.0156	<0.00050	**0.00672**	0.0667	<0.000100	<0.000250	0.871	0.0000268	<0.000050	<0.00050	<0.00050
MW25A	6-Jun-2014	-	0.00078	-	0.081	-	-	-	<0.000025	-	<0.0010	-
	4-Jun-2015	0.0051	0.0011	0.0021	0.081	-	-	0.81	0.000022	-	<0.0010	-
	8-Jun-2016	0.0046	<0.00060	0.0019	0.088	-	-	0.94	<0.000020	-	<0.0010	-
	7-Jun-2017	0.0043	0.00064	0.0023	0.100	-	-	0.83	<0.000020	-	<0.0010	-
	26-Jun-2018	0.0034	<0.00060	0.0024	0.083	-	-	0.89	<0.00002	-	<0.0010	-
	17-Jun-2019	0.012	<0.00060	0.0023	0.098	<0.0010	-	0.85	<0.000020	-	<0.0010	<0.00030
	5-Jun-2020	<0.0030	0.00076	0.002	0.099	<0.001	-	0.89	<0.000020	-	<0.0010	0.00032
	3-Jun-2021	<0.0050	<0.00050	0.00288	0.1	<0.00050	<0.00025	0.97	<0.000025	<0.000050	<0.00050	<0.00050
	10-Jun-2022	0.0032	<0.00020	0.00321	0.0832	<0.000040	<0.00010	0.764	<0.000010	<0.000020	<0.0010	0.0003
	16-Jun-2023	0.0058	<0.00050	0.00339	0.0955	<0.000100	<0.000250	0.874	<0.0000250	<0.000050	<0.00050	<0.00050
MW26A	6-Jun-2014	-	<0.00060	-	0.045	-	-	-	0.000034	-	0.0012	-
	4-Jun-2015	0.0049	<0.00060	0.0021	0.033	-	-	0.74	<0.000020	-	<0.0010	-
	8-Jun-2016	**0.15**	<0.00060	0.0024	0.047	-	-	0.85	<0.000020	-	<0.0010	-
	7-Jun-2017	0.0099 *	<0.00060 *	0.0023 *	0.054 *	-	-	0.81 *	<0.000020 *	-	<0.0010 *	-
	26-Jun-2018	0.0038	<0.00060	0.0021	0.053	-	-	0.80	<0.00002	-	<0.0010	-
	17-Jun-2019	0.0073	<0.00060	0.002	0.048	<0.0010	-	0.80	<0.000020	-	<0.0010	<0.00030
	5-Jun-2020	0.0084	<0.00060	0.0018	0.054	<0.001	-	0.83	<0.000020	-	<0.0010	<0.0003
	3-Jun-2021	0.0147	<0.00050	0.0026	0.0808	<0.00050	<0.00025	0.95	0.000039	<0.000050	<0.00050	<0.00050
	10-Jun-2022	0.0205	<0.00020	0.0027	0.0541	<0.000040	<0.00010	0.76	0.0000238	0.000022	<0.0010	0.00027
	16-Jun-2023	0.0264	<0.00050	0.00242	0.0544	<0.000100	<0.000250	0.822	<0.0000250	<0.000050	0.0011	<0.00050
MW27A	30-May-2014	-	<0.00060	-	0.025	-	-	-	<0.000025	-	0.0031	-
	4-Jun-2015	0.0043	<0.00060	0.0024	0.011	-	-	0.77	<0.000020	-	<0.0010	-
	8-Jun-2016	**0.073**	<0.00060	0.0028	0.014	-	-	0.75	<0.000020	-	<0.0010	-
	7-Jun-2017	0.029	<0.00060	0.0030	0.016	-	-	0.83	<0.000020	-	<0.0010	-
	26-Jun-2018	0.006	<0.00060	0.0027	0.014	-	-	0.82	<0.00002	-	<0.0010	-
	17-Jun-2019	0.0036	<0.00060	0.0023	0.013	<0.0010	-	0.81	<0.000020	-	<0.0010	<0.00030
	4-Jun-2020	0.022	<0.00060	0.0025	0.014	<0.001	-	0.79	<0.000020	-	<0.0010	<0.0003
	2-Jun-2021	0.0211	<0.0001	0.00277	0.015	<0.00010	<0.000050	0.451	<0.000005	0.000025	<0.00010	0.00012
	10-Jun-2022	0.0086	<0.00020	0.00284	0.0137	<0.000040	<0.00010	0.753	<0.000010	0.000031	<0.0010	<0.00020
	16-Jun-2023	0.0051	<0.00050	0.00262	0.0146	<0.000100	<0.000250	0.793	<0.0000250	<0.000050	<0.00050	<0.00050

Monitoring Well	Date	Copper	Iron	Lead	Lithium	Manganese	Mercury	Molybdenum	Nickel	Phosphorus	Rubidium	Selenium	Silicon
	Unit	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		0.007	0.3	0.001-0.007	-	0.05	0.000005	-	0.007-0.17	-	-	0.002	-
MW21A	6-Jun-2014	0.0015	0.22	0.00024	-	-	**0.0000058**	-	0.0027	-	-	-	-
	4-Jun-2015	0.0012	<0.060	<0.00020	-	<0.0040	<0.0000050	-	0.0029	-	-	0.00022	-
	8-Jun-2016	0.0025	<0.060	<0.00020	-	<0.0040	<0.0000020	-	0.0031	-	-	<0.00020	-
	7-Jun-2017	0.0016	<0.060	<0.00020	-	0.0047	<0.0000020	-	0.0028	-	-	0.00020	-
	26-Jun-2018	0.0021	<0.06	<0.00020	-	0.0048	-	-	0.0031	-	-	0.00025	-
	17-Jun-2019	0.005	0.13	0.00041	0.1	0.014	<0.0000020	0.0052	0.0027	<0.10	-	<0.00020	3
	5-Jun-2020	0.0020	<0.060	<0.00020	0.12	0.0073	<0.0000019	0.0055	0.0027	<0.1	-	0.00023	3.0
	3-Jun-2021	0.0033	<0.050	<0.00025	0.14	**0.228**	<0.0000050	0.00652	0.0047	<0.25	0.004	<0.00025	3.6
	10-Jun-2022	0.0020	<0.030	<0.000050	0.11	**0.092**	-	0.00476	0.00333	<0.050	0.00351	0.000363	3.3
	15-Jun-2023	0.0005	0.019	<0.000050	0.121	**0.144**	<0.0000050	0.00623	0.00434	<0.050	0.00341	0.000154	3.43
MW22A	6-Jun-2014	0.00084	0.065	<0.00020	-	-	<0.0000050	-	0.0024	-	-	-	-
	4-Jun-2015	<0.0020	<0.060	<0.0020	-	0.018	<0.0000050	-	<0.0050	-	-	<0.0020	-
	8-Jun-2016	0.0024	*<0.60*	<0.00020	-	<0.040	<0.0000020	-	0.0051	-	-	<0.00020	-
	7-Jun-2017	0.002	*<0.60*	<0.00020	-	<0.040	<0.0000020	-	0.0023	-	-	<0.00020	-
	26-Jun-2018	0.0012	*<0.6*	<0.00020	-	<0.04	-	-	0.0022	-	-	<0.00020	-
	17-Jun-2019	0.002	*<0.60*	<0.00020	0.31	<0.040	<0.0000020	0.0051	0.0034	<1.0	-	<0.00020	2.7
	5-Jun-2020	0.0009	<0.060	<0.00020	0.33	0.035	<0.0000019	0.0051	0.0032	<0.1	-	0.00026	3
	3-Jun-2021	0.0022	<0.050	<0.00025	0.318	0.00599	<0.0000050	0.00519	0.0026	<0.25	0.0066	<0.00025	3.03
	10-Jun-2022	0.0014	0.151	<0.00025	0.312	**0.0662**	-	0.00453	0.00328	<0.25	0.00847	<0.00025	3.42
	16-Jun-2023	0.00128	<0.050	<0.000250	0.334	**0.0866**	<0.0000050	0.00547	0.00304	<0.250	0.0083	<0.000250	3.02
MW23A	30-May-2014	0.0028	**0.38**	0.00088	-	-	<0.0000050	-	**0.0097**	-	-	-	-
	4-Jun-2015	0.00042	<0.060	<0.00020	-	0.0071	<0.0000050	-	0.0032	-	-	<0.00020	-
	8-Jun-2016	0.00049	<0.060	<0.00020	-	0.0079	<0.0000020	-	0.0031	-	-	<0.00020	-
	7-Jun-2017	<0.00020	<0.060	<0.00020	-	0.0064	<0.0000020	-	**0.0095**	-	-	<0.00020	-
	26-Jun-2018	0.00029	<0.06	<0.00020	-	0.0084	<0.000002	-	0.0022	-	-	<0.00020	-
	17-Jun-2019	0.0006	<0.060	<0.00020	0.1	0.008	<0.0000020	0.0039	0.0032	0.14	-	<0.00020	3.3
	5-Jun-2020	0.00038	<0.06	<0.0002	0.12	0.005	<0.0000019	0.0034	0.0016	0.13	-	**0.0031**	3.7
	3-Jun-2021	<0.0010	<0.050	<0.00025	0.11	0.00219	<0.0000050	0.00335	<0.0025	<0.25	0.0027	0.00058	4.37
	10-Jun-2022	0.00059	0.169	0.000196	0.12	<0.010	-	0.00316	0.00233	0.165	0.00376	0.000105	5.04
	16-Jun-2023	<0.00100	<0.050	<0.000250	0.112	0.00601	<0.0000050	0.00303	<0.00250	0.271	0.00345	<0.000250	4.24
MW25A	6-Jun-2014	0.0009	<0.060	<0.00020	-	-	<0.0000050	-	0.0025	-	-	-	-
	4-Jun-2015	0.0009	<0.060	<0.00020	-	**0.051**	<0.0000050	-	0.0032	-	-	0.00041	-
	8-Jun-2016	0.00045	<0.060	<0.00020	-	**0.10**	<0.0000020	-	0.0023	-	-	<0.00020	-
	7-Jun-2017	<0.00020	<0.060	<0.00020	-	**0.07**	<0.0000020	-	0.0022	-	-	<0.00020	-
	26-Jun-2018	<0.00020	0.069	<0.00020	-	**0.13**	<0.000002	-	0.0015	-	-	<0.00020	-
	17-Jun-2019	0.002	<0.060	0.0002	0.097	**0.063**	<0.0000020	0.0063	0.0021	0.12	-	<0.00020	3.3
	5-Jun-2020	0.0055	<0.060	<0.00020	0.12	**0.051**	<0.0000019	0.0039	0.0023	<0.1	-	<0.00020	2.9
	3-Jun-2021	0.0011	<0.050	<0.00025	0.129	**0.112**	<0.0000050	0.00674	<0.0025	<0.25	0.0035	<0.00025	4.55
	10-Jun-2022	0.0006	<0.060	<0.00010	0.102	**0.0696**	-	0.00806	0.00216	0.161	0.00312	<0.00010	3.63
	16-Jun-2023	<0.00100	0.094	<0.000250	0.112	**0.0697**	<0.0000050	0.00892	<0.00250	<0.250	0.00308	<0.000250	3.56
MW26A	6-Jun-2014	0.0018	0.15	0.0012	-	-	<0.0000050	-	0.0024	-	-	-	-
	4-Jun-2015	0.0015	<0.060	<0.00020	-	0.0098	<0.0000050	-	0.0017	-	-	<0.00020	-
	8-Jun-2016	0.0058	0.084	0.00083	-	<0.0040	<0.0000020	-	0.0039	-	-	<0.00020	-
	7-Jun-2017	0.004 *	<0.060 *	*<0.060 **	-	<0.0040 *	-	-	**8.5 ***	-	-	0.0019 *	-
	26-Jun-2018	0.0034	<0.06	<0.00020	-	0.005	0.000003	-	0.0020	-	-	<0.00020	-
	17-Jun-2019	0.0043	<0.060	<0.00020	0.13	0.0077	-	0.0021	0.0016	0.13	-	<0.00020	4.1
	5-Jun-2020	0.0038	<0.060	<0.00020	0.14	<0.0040	<0.0000019	0.0016	0.00073	0.1	-	<0.00020	4.2
	3-Jun-2021	0.0055	<0.050	<0.00025	0.179	0.00997	<0.0000050	0.00236	0.0026	<0.25	0.0041	<0.00025	5.4
	10-Jun-2022	**0.00944**	<0.060	<0.00010	0.139	<0.010	-	0.00185	0.00406	<0.10	0.00297	0.000103	4.13
	16-Jun-2023	0.0036	<0.050	<0.000250	0.151	0.016	<0.0000050	0.00543	<0.00250	<0.250	0.00347	<0.000250	4.29
MW27A	30-May-2014	0.0019	**0.46**	0.00077	-	-	<0.0000050	-	0.003	-	-	-	-
	4-Jun-2015	0.00053	<0.060	<0.00020	-	0.013	<0.0000050	-	0.0012	-	-	<0.00020	-
	8-Jun-2016	0.00098	<0.060	<0.00020	-	0.011	0.0000021	-	0.0033	-	-	<0.00020	-
	7-Jun-2017	0.0003	<0.060	<0.00020	-	0.012	<0.0000020	-	0.0014	-	-	<0.00020	-
	26-Jun-2018	0.00047	<0.06	<0.00020	-	0.011	0.0000023	-	0.00073	-	-	<0.00020	-
	17-Jun-2019	0.00024	<0.060	<0.00020	0.12	0.011	<0.0000020	0.0012	<0.00050	0.19	-	<0.00020	3.9
	4-Jun-2020	0.00059	<0.060	<0.00020	0.12	0.012	<0.0000019	0.0012	0.00054	0.15	-	<0.00020	3.8
	2-Jun-2021	0.00104	0.014	<0.000050	0.109	0.012	<0.000005	0.000967	0.00056	0.198	0.00407	0.000076	4.25
	10-Jun-2022	0.00125	<0.060	<0.00010	0.138	0.0111	-	0.00126	0.00146	0.174	0.00398	<0.00010	3.98
	16-Jun-2023	<0.00100	<0.050	<0.000250	0.139	0.0115	<0.0000050	0.00232	<0.00250	<0.250	0.0042	<0.000250	3.88

Monitoring Well	Date	Silver	Strontium	Sulphur	Tellurium	Thallium	Thorium	Tin	Titanium	Tungsten	Uranium	Vanadium	Zinc	Zirconium
	Unit	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		0.0001	-	-	-	-	-	-	-	-	0.01	-	0.03	-
MW21A	6-Jun-2014	-	-	-	-	-	-	-	-	-	-	-	<0.0030	-
	4-Jun-2015	<0.00010	-	-	-	-	-	-	-	-	0.0034	-	<0.0030	-
	8-Jun-2016	<0.00010	-	-	-	-	-	-	-	-	0.0033	-	<0.0030	-
	7-Jun-2017	<0.00010	-	-	-	-	-	-	-	-	0.0036	-	<0.0030	-
	26-Jun-2018	<0.00010	-	-	-	-	-	-	-	-	0.0035	-	<0.0030	-
	17-Jun-2019	<0.00010	0.11	20	-	<0.00020	-	<0.0010	<0.0010	-	0.0033	<0.0010	0.01	-
	5-Jun-2020	<0.00010	0.11	22	-	<0.0002	-	<0.001	<0.001	-	0.0036	<0.001	<0.0030	-
	3-Jun-2021	<0.000050	0.127	19.8	<0.0010	<0.000050	<0.00050	<0.00050	<0.0015	<0.00050	0.0044	<0.0025	0.029	0.0031
	10-Jun-2022	<0.000010	0.102	21.5	<0.00020	<0.000010	<0.00010	0.00013	0.00045	<0.00010	0.00327	<0.00050	<0.0010	0.00202
	15-Jun-2023	<0.000010	0.111	16.5	<0.00020	<0.000010	0.00016	0.00015	<0.00030	0.00023	0.00327	<0.00050	<0.0010	0.0035
MW22A	6-Jun-2014	-	-	-	-	-	-	-	-	-	-	-	<0.0030	-
	4-Jun-2015	*<0.0010*	-	-	-	-	-	-	-	-	0.004	-	<0.030	-
	8-Jun-2016	<0.00010	-	-	-	-	-	-	-	-	0.0042	-	0.0033	-
	7-Jun-2017	<0.00010	-	-	-	-	-	-	-	-	0.0041	-	<0.0030	-
	26-Jun-2018	<0.00010	-	-	-	-	-	-	-	-	0.0041	-	<0.0030	-
	17-Jun-2019	<0.00010	0.95	630	-	<0.00020	-	<0.0010	<0.0010	-	0.0041	<0.0010	<0.0030	-
	5-Jun-2020	<0.00010	0.86	680	-	<0.0002	-	<0.001	<0.001	-	0.0044	<0.001	0.0032	-
	3-Jun-2021	<0.000050	0.874	736	<0.0010	<0.000050	<0.00050	<0.00050	<0.0015	<0.00050	0.00394	<0.0025	0.0197	<0.0010
	10-Jun-2022	<0.000050	0.85	700	<0.0010	<0.000050	<0.00050	<0.00050	0.00584	<0.00050	0.00395	<0.0025	<0.0050	0.00263
	16-Jun-2023	<0.000050	0.924	727	<0.00100	<0.000050	<0.00050	<0.00050	<0.00150	<0.00050	0.00373	<0.00250	<0.0050	<0.00100
MW23A	30-May-2014	-	-	-	-	-	-	-	-	-	-	-	0.0031	-
	4-Jun-2015	<0.00010	-	-	-	-	-	-	-	-	0.0032	-	<0.0030	-
	8-Jun-2016	<0.00010	-	-	-	-	-	-	-	-	0.0027	-	<0.0030	-
	7-Jun-2017	<0.00010	-	-	-	-	-	-	-	-	0.0049	-	<0.0030	-
	26-Jun-2018	<0.00010	-	-	-	-	-	-	-	-	0.0024	-	<0.0030	-
	17-Jun-2019	<0.00010	0.12	28	-	<0.00020	-	<0.0010	<0.0010	-	0.0017	<0.0010	<0.0030	-
	5-Jun-2020	<0.00010	0.11	41	-	<0.0002	-	<0.001	<0.001	-	0.0018	<0.001	<0.0030	-
	3-Jun-2021	<0.000050	0.105	40.2	<0.0010	<0.000050	<0.00050	<0.00050	<0.0015	0.00093	0.00138	<0.0025	0.0202	0.0016
	10-Jun-2022	<0.000020	0.11	29.9	<0.00040	<0.000020	<0.00020	<0.00020	0.00912	0.00092	0.00141	0.00136	<0.0020	0.00213
	16-Jun-2023	<0.000050	0.127	23.2	<0.00100	<0.000050	<0.00050	<0.00050	<0.00150	0.00094	0.00103	<0.00250	<0.0050	0.00214
MW25A	6-Jun-2014	-	-	-	-	-	-	-	-	-	-	-	<0.0030	-
	4-Jun-2015	<0.00010	-	-	-	-	-	-	-	-	0.0015	-	<0.0030	-
	8-Jun-2016	<0.00010	-	-	-	-	-	-	-	-	0.00074	-	<0.0030	-
	7-Jun-2017	<0.00010	-	-	-	-	-	-	-	-	0.0012	-	<0.0030	-
	26-Jun-2018	<0.00010	-	-	-	-	-	-	-	-	0.00036	-	<0.0030	-
	17-Jun-2019	<0.00010	0.12	0.72	-	<0.00020	-	<0.0010	<0.0010	-	0.001	<0.0010	<0.0030	-
	5-Jun-2020	<0.00010	0.11	1.7	-	<0.0002	-	<0.001	0.0019	-	0.0018	0.0012	0.0033	-
	3-Jun-2021	<0.000050	0.137	<2.5	<0.0010	<0.000050	<0.00050	<0.00050	<0.0015	<0.00050	0.0005	<0.0025	<0.0050	0.0026
	10-Jun-2022	<0.000020	0.114	<1.0	<0.00040	<0.000020	<0.00020	<0.00020	<0.00060	0.00028	0.0005	<0.0010	<0.0020	0.00256
	16-Jun-2023	<0.000050	0.131	<2.50	<0.00100	<0.000050	<0.00050	<0.00050	<0.00150	<0.00050	0.000719	<0.00250	<0.0050	0.00299
MW26A	6-Jun-2014	-	-	-	-	-	-	-	-	-	-	-	0.013	-
	4-Jun-2015	<0.00010	-	-	-	-	-	-	-	-	0.00063	-	<0.0030	-
	8-Jun-2016	<0.00010	-	-	-	-	-	-	-	-	0.00065	-	<0.0030	-
	7-Jun-2017	-	-	-	-	-	-	-	-	-	0.00063 *	-	0.0032 *	-
	26-Jun-2018	<0.00010	-	-	-	-	-	-	-	-	0.00069	-	<0.0030	-
	17-Jun-2019	<0.00010	0.19	150	-	<0.00020	-	<0.0010	<0.0010	-	0.00059	0.0014	<0.0030	-
	5-Jun-2020	<0.00010	0.2	180	-	<0.0002	-	<0.001	<0.001	-	0.00062	<0.001	<0.0030	-
	3-Jun-2021	<0.000050	0.271	245	<0.0010	<0.000050	<0.00050	<0.00050	<0.0015	<0.00050	0.000662	<0.0025	0.0284	<0.0010
	10-Jun-2022	<0.000020	0.19	167	<0.00040	<0.000020	<0.00020	0.00031	0.00068	0.00023	0.000573	<0.0010	<0.0020	0.00098
	16-Jun-2023	<0.000050	0.207	176	<0.00100	<0.000050	<0.00050	<0.00050	<0.00150	0.00057	0.000682	0.00273	<0.0050	0.00106
MW27A	30-May-2014	-	-	-	-	-	-	-	-	-	-	-	0.0049	-
	4-Jun-2015	<0.00010	-	-	-	-	-	-	-	-	0.00055	-	<0.0030	-
	8-Jun-2016	<0.00010	-	-	-	-	-	-	-	-	0.00065	-	<0.0030	-
	7-Jun-2017	<0.00010	-	-	-	-	-	-	-	-	0.00057	-	<0.0030	-
	26-Jun-2018	<0.00010	-	-	-	-	-	-	-	-	0.00055	-	<0.0030	-
	17-Jun-2019	<0.00010	0.21	220	-	<0.00020	-	<0.0010	<0.0010	-	0.00054	<0.0010	<0.0030	-
	4-Jun-2020	<0.00010	0.21	220	-	<0.0002	-	<0.001	<0.001	-	0.00058	<0.001	<0.0030	-
	2-Jun-2021	<0.000010	0.168	271	<0.00020	<0.000010	<0.00010	<0.00010	0.00031	0.00015	0.000444	<0.00050	0.0191	0.00051
	10-Jun-2022	<0.000020	0.2	238	<0.00040	<0.000020	<0.00020	<0.00020	<0.00060	0.00032	0.000592	<0.0010	<0.0020	<0.00060
	16-Jun-2023	<0.000050	0.22	244	<0.00100	<0.000050	<0.00050	<0.00050	<0.00150	<0.00050	0.000547	<0.00250	<0.0050	<0.00100

Notes:

[1] Alberta Environment and Parks (AEP). 2022. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. ISBN 978-1-4601-5501-1. Referenced guidelines are for fine textured soils under Agricultural land use

[2] Alberta Environment and Parks (AEP). Environmental Quality Guidelines for Alberta Surface Waters. March 2018. Table 1 Surface water quality guidelines for the protection of freshwater aquatic life (PAL). Most conservative values applied (chronic or acute).

[3] Guideline varies with hardness.

[4] Guideline varies with pH and temperature.

[5] Guideline varies with chloride.

[6] Guideline varies with pH.

"-" No applicable guideline or not analyzed.

BOLD - Greater than Tier 1 Guideline.

Italic - Detection limit greater than Tier 1 guideline.

* - laboratory filtered.

TETRA TECH

Table 4c: Field and Groundwater Analytical Results Summary - Clay Shale Wells

	Parameter Group	Dissolved Metals																																					
	Parameter	Aluminum	Antimony	Arsenic	Barium	Beryllium	Bismuth	Boron	Cadmium	Cesium	Chromium	Cobalt	Copper	Iron	Lead	Lithium	Manganese	Mercury	Molybdenum	Nickel	Phosphorus	Rubidium	Selenium	Silicon	Silver	Strontium	Sulphur	Tellurium	Thallium	Thorium	Tin	Titanium	Tungsten	Uranium	Vanadium	Zinc	Zirconium
	Unit	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		0.007-0.05	0.006	0.005	1	-	-	1.0	0.00004-0.00037	-	0.05	-	0.007	0.3	0.001-0.007	-	0.05	0.000005	-	0.007-0.17	-	-	0.002	-	0.0001	-	-	-	-	-	-	-	-	0.01	-	0.03	-
Monitoring Well	**Date**																																						
MW28A	30-May-2014	-	<0.00060		0.015	-	-	-	<0.000025	-	<0.0010	-	0.0021	0.29	0.00022	-	-	<0.0000050	-	0.0024	-	-		-	-	-	-	-	-	-	-	-	-	-	-	0.0039	-
	4-Jun-2015	0.0046	<0.00060	0.0010	<0.010	-	-	0.74	<0.000020	-	<0.0010	-	0.00044	<0.060	<0.00020	-	0.029	<0.000050	-	0.0014	-	-	<0.00020	-	<0.00010	-	-	-	-	-	-	-	-	0.00056	-	<0.0030	-
	8-Jun-2016	0.012	<0.00060	0.00084	<0.010	-	-	0.77	<0.000020	-	<0.0010	-	0.00085	<0.060	<0.00020	-	<0.0040	<0.0000020	-	0.0018	-	-	<0.00020	-	<0.00010	-	-	-	-	-	-	-	-	0.00031	-	<0.0030	-
	7-Jun-2017	0.005	<0.00060	0.00053	<0.010	-	-	0.82	<0.000020	-	<0.0010	-	<0.00020	<0.060	<0.00020	-	0.019	<0.0000020	-	0.00082	-	-	<0.00020	-	<0.00010	-	-	-	-	-	-	-	-	0.00025	-	<0.0030	-
	26-Jun-2018	<0.003	<0.00060	0.00085	<0.010	-	-	0.80	<0.000002	-	<0.0010	-	0.00041	<0.06	<0.00020	-	0.023	<0.000002	-	0.00079	-	-	<0.00020	-	<0.00010	-	-	-	-	-	-	-	-	0.00051	-	<0.0030	-
	17-Jun-2019	0.013	<0.00060	0.00064	0.011	<0.0010	-	0.80	<0.000020	-	<0.0010	<0.00030	0.00098	<0.060	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4-Jun-2020	0.014	<0.00060	0.00073	<0.010	<0.001	-	0.78	<0.000020		<0.0010	<0.0003	0.0005	<0.060	<0.00020	0.15	0.027	<0.0000019	0.0018		-	-	<0.00020	**4**	<0.00010	0.28	360	-	<0.0002		-	<0.001	<0.001		0.00039	<0.001	<0.003	
	2-Jun-2021	0.0051	<0.00020	0.00076	0.00868	<0.00020	<0.00010	0.71	<0.000010	0.000061	<0.00020	<0.00020	0.00051	<0.020	<0.00010	0.151	0.0231	<0.000005	0.00175	<0.0010	0.13	0.00484	<0.00010	4.03	<0.000020	0.30	380	<0.00040	<0.00002	<0.00020	<0.00020	<0.00060	<0.00020	0.000388	<0.0010	0.018	0.00044
	10-Jun-2022	0.0025	<0.00020	0.0008	0.00811	<0.000040	<0.00010	0.71	<0.000010	0.000058	<0.0010	<0.00020	0.00085	<0.060	<0.00010	0.148	0.0202		0.00144	0.00123	0.109	0.00486	<0.00010	4.14	<0.000020	0.28	356	<0.00040	<0.000020	<0.00020	<0.00020	<0.00060	0.00028	0.000354	<0.0010	<0.0020	<0.00060
	16-Jun-2023	0.0082	<0.00050	0.00068	0.00909	<0.000100	<0.000250	0.728	<0.000250	0.000069	<0.00050	<0.00050	<0.00100	0.235	<0.000250	0.159	0.0213	<0.0000050	0.00176	<0.00250	<0.250	0.00452	<0.00250	3.97	<0.000050	0.314	338	<0.00100	<0.000050	<0.00050	<0.00050	<0.00150	<0.00050	0.000321	<0.00250	<0.0050	<0.00100
MW32A	4-Jun-2015	<0.030	<0.0060	0.0041	<0.10	-	-	0.85	<0.00020	-	<0.010	-	<0.0020	<0.62	<0.0020	-	**0.15**	<0.0000050	-	0.011	-	-	<0.0020	-	<0.0010	-	-	-	-	-	-	-	-	0.0080	-	<0.030	-
	8-Jun-2016	0.029	<0.00060	0.00051	0.015	-	-	**1.2**	<0.000020	-	0.0015	-	0.0031	0.12	<0.00020	-	**0.12**	0.0000023	-	0.0032	-	-	<0.00020	-	<0.00010	-	-	-	-	-	-	-	-	0.00016	-	0.015	-
	7-Jun-2017	0.008	<0.00060	0.00037	<0.10	-	-	**1.2**	0.000021	-	<0.0010	-	0.00073	<0.62	<0.00020	-	**0.14**	<0.0000020	-	0.0016	-	-	<0.00020	-	<0.00010	-	-	-	-	-	-	-	-	0.00014	-	<0.0030	-
	26-Jun-2018	0.008	<0.00060	0.00035	<0.10	-	-	**1.2**	0.000021	-	<0.0010	-	0.0082	<0.6	<0.00020	-	**0.12**	0.0000032	-	0.0026	-	-	<0.00020	-	<0.00010	-	-	-	-	-	-	-	-	0.00013	-	0.0091	-
	12-Jun-2019	<0.0030	<0.00060	0.00039	<1.0	<0.0010	-	**1.1**	<0.000020	-	<0.0010	0.00047	0.0016	<0.60	<0.00020	<2.0	**0.11**	<0.0000020	0.00064	0.0011	<10	-	0.00025	<10	<0.00010	2.8	1300	-	<0.00020	-	<0.0010	<0.0010	-	0.00011	<0.0010	<0.0030	-
	29-May-2020	<0.0030	<0.00060	0.00061	0.021	<0.001	-	0.94	0.000027		<0.0010	0.00052	0.0012	<0.060	<0.00020	0.38	**0.16**	<0.0000019	0.0012	0.0018	<0.1	-	<0.00020	4.1	<0.00010	2.4	1300	-	<0.0002	-	<0.001	<0.001	-	0.00042	<0.001	<0.0030	-
	4-Jun-2021	0.0051	<0.00050	0.0005	0.0139	<0.00050	<0.00025	0.916	<0.000025	0.000108	<0.00050	<0.00050	0.0011	<0.050	<0.00025	0.403	**0.151**	<0.0000050	0.00112	<0.0025	<0.25	0.0125	<0.00025	4.17	<0.000050	2.41	1320	<0.0010	<0.000050	<0.00050	<0.00050	<0.0015	<0.00050	0.0003	<0.0025	0.0182	<0.0010
	10-Jun-2022	0.0146	<0.00050	0.00067	0.0146	<0.00010	<0.00025	0.966	<0.000025	0.000124	<0.0025	<0.00050	<0.0010	<0.15	<0.00025	0.437	**0.152**	0.000986	<0.00050	<0.0025	<0.25	0.0128	<0.00025	5.09	<0.000050	2.56	1440	<0.0010	<0.000050	<0.00050	<0.00050	<0.0015	<0.00050	0.000287	<0.0025	<0.0050	<0.0015
	16-Jun-2023	<0.0100	<0.00100	<0.00100	0.0124	<0.000200	<0.000500	0.912	<0.0000500	0.000142	<0.00100	<0.00100	<0.00200	<0.100	<0.000500	0.446	**0.145**	<0.0000050	0.00102	<0.00500	<0.500	0.0142	<0.000500	4.94	<0.000100	2.76	1,320	<0.00200	<0.000100	<0.00100	<0.00100	<0.00300	<0.00100	0.000175	<0.00500	<0.0100	<0.00200
15MW35A	8-Jun-2016	**0.092**	<0.00060	0.0035	0.080	-	-	0.75	<0.000020	-	<0.0010	-	0.0011	0.11	<0.00020	-	0.012	<0.000022	-	0.0053	-	-	<0.00020	-	<0.00010	-	-	-	-	-	-	-	-	0.0013	-	0.0035	-
	7-Jun-2017	**0.055**	<0.00060	0.0023	0.130	-	-	0.74	<0.000020	-	<0.0010	-	0.00065	<0.060	<0.00020	-	0.013	<0.0000020	-	0.0034	-	-	<0.00020	-	<0.00010	-	-	-	-	-	-	-	-	0.00095	-	<0.0030	-
	26-Jun-2018	**0.12**	<0.00060	0.0015	0.084	-	-	0.79	<0.00002	-	<0.0010	-	0.0022	0.28	<0.00020	-	0.028	-	-	0.0016	-	-	<0.00020	-	<0.00010	-	-	-	-	-	-	-	-	0.00073	-	<0.0030	-
	17-Jun-2019																																						
	5-Jun-2020	0.0076	<0.00060	0.0011	0.078	<0.001	-	0.82	<0.000020	-	<0.0010	0.00042	0.0025	0.069	<0.00020	0.079	0.017	<0.0000019	0.015	0.0017	0.23	-	0.00026	4.4	<0.00010	0.074	4.9	-	<0.0002	-	<0.001	0.0012	-	0.00076	<0.001	<0.0030	-
	3-Jun-2021	0.0049	<0.00046	0.00163	0.0752	<0.00010	<0.000050	0.762	<0.000056	0.000034	0.00014	0.00063	0.00478	0.058	0.000145	0.0778	0.0198	<0.000000	0.0152	0.00212	0.2	0.00296	0.0001	4.36	<0.00010	0.0721	4.64	<0.00020	<0.000010	<0.00010	<0.00045	0.00061	0.00172	0.000734	0.00128	0.0079	0.00158
	9-Jun-2022	**0.45**	<0.0010	0.00134	0.0956	<0.00020	<0.00050	0.777	<0.000050	0.000129	<0.0050	<0.0010	**0.0143**	**0.602**	0.000826	0.0788	<0.050		0.0147	<0.0050	<0.50	0.00341	<0.00050	5.54	<0.00010	0.0791	6.42	<0.0020	<0.00010	<0.0010	<0.0010	0.0131	0.00186	0.000743	<0.0050	<0.010	<0.0030
	16-Jun-2023	0.0223	0.00118	0.00252	0.0707	<0.000100	<0.000250	0.99	**0.000578**	0.000122	<0.00050	0.00068	**0.0315**	0.054	<0.000250	0.0974	0.00133	<0.0000050	0.0208	0.00731	0.379	0.0039	<0.000250	5.5	<0.000050	0.112	8.64	<0.00100	<0.000050	<0.00050	0.00052	0.00194	0.00216	0.000857	<0.00250	<0.0050	0.00274
15MW36A	8-Jun-2016	0.015	<0.00060	0.0012	0.031	-	-	0.82	<0.000020	-	<0.0010	-	0.0026	<0.060	<0.00020	-	0.022	**0.000017**	-	0.0019	-	-	<0.00020	-	<0.00010	-	-	-	-	-	-	-	-	0.00037	-	0.0033	-
	7-Jun-2017	0.0093	<0.00060	0.00075	0.034	-	-	0.79	<0.000020	-	<0.0010	-	<0.00020	<0.060	<0.00020	-	0.032	<0.0000020	-	0.00085	-	-	<0.00020	-	<0.00010	-	-	-	-	-	-	-	-	0.00026	-	<0.0030	-
	26-Jun-2018	0.0071	<0.00060	0.001	0.033	-	-	0.84	<0.00002	-	<0.0010	-	0.00041	<0.06	<0.00020	-	0.039	0.0000026	-	0.0012	-	-	<0.00020	-	<0.00010	-	-	-	-	-	-	-	-	0.00058	-	<0.0030	-
	12-Jun-2019	0.047	<0.00060	0.00069	0.046	<0.0010	-	0.87	<0.000020	-	<0.0010	0.0004	0.00099	0.076	<0.00020	0.073	0.033	<0.0000020	0.0081	0.00067	0.15	-	<0.00020	3.5	<0.00010	0.049	0.45	-	<0.00020	-	<0.0010	0.0033	-	0.00018	0.0032	<0.0030	-
	5-Jun-2020	0.0043	<0.00060	0.00095	0.044	<0.001	-	0.81	<0.000020	-	<0.0010	0.00050	<0.00020	0.10	<0.00020	0.07	**0.23**	<0.0000019	0.017	0.0022	0.26		<0.00020	3.7	<0.00010	0.051	0.94	-	<0.0002	-	<0.001	0.0011	-	0.0011	0.0024	<0.0030	-
	3-Jun-2021	0.0066	<0.00010	0.00085	0.058	<0.00010	<0.000050	0.771	0.000075	<0.000010	<0.00010	0.00033	0.00172	0.02	0.000066	0.0736	**0.19**	<0.0000050	0.00983	0.0008	0.248	0.00169	0.000058	3.98	<0.000010	0.0544	<0.50	<0.00020	<0.000010	<0.00010	0.00015	<0.00030	0.00052	0.000233	<0.00250	0.0211	0.00063
	10-Jun-2022	0.0228	<0.00010	0.00107	0.0639	<0.000020	<0.000050	0.701	0.000115	<0.000010	<0.00050	0.00033	0.00058	0.05	0.000131	0.0801	**0.17**		0.0114	0.00144	0.229	0.00188	0.000056	3.82	<0.000010	0.0575	<0.50	<0.00020	<0.000010	<0.00010	<0.00010	0.00131	0.00052	0.000237	<0.00050	<0.010	0.00063
	16-Jun-2023	0.0052	<0.00010	0.00114	0.0747	<0.000020	<0.000050	0.661	<0.000050	<0.000010	<0.00050	0.00027	0.0003	0.086	0.000081	0.0783	**0.179**	<0.0000050	0.0122	0.00057	0.313	0.00196	0.000068	4.13	<0.000010	0.0647	<0.50	<0.00020	<0.000010	<0.00010	<0.00010	<0.00030	0.00055	0.000184	<0.00050	0.0014	0.00074
19MW37A	15-Nov-2019	**0.90**	<0.00060	0.0019	0.018	<0.0010		0.60	0.000051		0.0011	0.0027	0.0029	**3.8**	**0.0042**	0.19	**0.43**	<0.0000020	0.00061	0.0061	0.16		<0.00020	6.1	<0.00010	0.55	370		<0.00020		0.0010	0.010		0.0033	0.0041	0.014	
	4-Jun-2020	0.01	<0.00060	0.0006	<0.010	<0.001		0.69	<0.000020		<0.0010	0.00069	0.0005	<0.060	<0.00020	0.2	**0.28**	<0.0000019	0.0013	0.0017	<0.1		<0.0002	3.9	<0.0001	0.45	390		<0.0002		0.0020	<0.001		0.0055	<0.001	0.0033	
	15-May-2023	**0.03**	<0.00100	<0.00100	0.0073	<0.000200	<0.000500	0.85	<0.0000500	<0.000100	<0.00500	<0.00100	<0.00200	<0.100	<0.000500	0.217	**0.215**	<0.0000050	0.00119	<0.00500	<0.500	0.00532	<0.000500	3.88	<0.000100	0.375	415	<0.00200	<0.000100	<0.00100	<0.00100	<0.00300	<0.00100	0.00219	<0.00500	<0.0100	<0.00200
23MW38A	21-Dec-2023	0.0192	0.00059	0.00354	0.0811	<0.000020	<0.000050	0.786	<0.000050	0.000038	<0.00050	0.00068	0.00114	0.014	<0.000050	0.0835	0.00706	<0.0000050	0.0136	0.00382	0.146	0.00365	0.00153	4.14	<0.0000010	0.124	50.4	<0.00020	0.000011	<0.00010	0.00047	0.00055	0.0005	0.00218	0.00174	<0.0010	0.00185

Notes:
[1] Alberta Environment and Parks (AEP). 2022. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. ISBN 978-1-4601-5501-1. Referenced guidelines are for fine textured soils under Agricultural land use
[2] Alberta Environment and Parks (AEP). Environmental Quality Guidelines for Alberta Surface Waters. March 2018. Table 1 Surface water quality guidelines for the protection of freshwater aquatic life (PAL). Most conservative values applied (chronic or acute).
[3] Guideline varies with hardness.
[4] Guideline varies with pH and temperature.
[5] Guideline varies with chloride.
[6] Guideline varies with pH.
, No applicable guideline or not analyzed.
BOLD - Greater than Tier 1 Guideline.
Italic - Detection limit greater than Tier 1 guideline.
* - laboratory filtered.
** - Data is unreliable for 2022.

TETRA TECH

Table 4c: Field and Groundwater Analytical Results Summary - Clay Shale Wells

Parameter Group: Volatile Organic Compounds (VOCs)

Monitoring Well	Date	Bromobenzene	Bromochloromethane	Bromodichloromethane	Bromoform	Bromomethane	n-Butylbenzene	sec-Butylbenzene	tert-Butylbenzene	Carbon tetrachloride	Chlorobenzene	Chloroethane	Chloroform	Chloromethane	2-Chlorotoluene	4-Chlorotoluene	Dibromochloromethane	1,2-Dibromo-3-chloropropane	1,2-Dibromoethane	Dibromomethane
Unit		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		-	-	-	-	-	-	-	-	0.002	0.0013	-	0.08	-	-	-	0.1	-	-	0.1
MW1B	6-Jun-2014			-	-	-				-	-	-	-	-			-		-	
	28-May-2015			-	-	-				-	-	-	-	-			-		-	
	8-Jun-2016			-	-	-				-	-	-	-	-			-		-	
	7-Jun-2017			-	-	-				-	-	-	-	-			-		-	
	26-Jun-2018			-	-	-				-	-	-	-	-			-		-	
	12-Jun-2019			<0.00050	<0.00050	<0.0020				<0.00050	<0.00050	<0.0010	<0.00050	<0.0020			<0.0010		<0.00020	
	5-Jun-2020			<0.00050	<0.00050	<0.0020				<0.00050	<0.00050	<0.0010	<0.00050	<0.0020			<0.0010		<0.00020	
	4-Jun-2021	<0.0010	<0.0010	<0.0010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	10-Jun-2022	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00020	<0.00050	<0.00050	<0.00050	<0.0020	<0.00050	<0.00050	<0.00050	<0.00050	<0.00020	<0.00050
	15-Jun-2023	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
MW8A	30-May-2014			-	-	-				-	-	-	-	-			-		-	
	28-May-2015			-	-	-				-	-	-	-	-			-		-	
	8-Jun-2016			-	-	-				-	-	-	-	-			-		-	
	7-Jun-2017			-	-	-				-	-	-	-	-			-		-	
	26-Jun-2018			-	-	-				-	-	-	-	-			-		-	
	12-Jun-2019			<0.00050	<0.00050	<0.0020				<0.00050	<0.00050	<0.0010	<0.00050	<0.0020			<0.0010		<0.00020	
	29-May-2020			<0.00050	<0.00050	<0.0020				<0.00050	<0.00050	<0.0010	<0.00050	<0.0020			<0.0010		<0.00020	
	4-Jun-2021	<0.0010	<0.0010	<0.0010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	10-Jun-2022	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00020	<0.00050	<0.00050	<0.00050	<0.0020	<0.00050	<0.00050	<0.00050	<0.00050	<0.00020	<0.00050
	15-Jun-2023	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
MW12B	30-May-2014			-	-	-				-	-	-	-	-			-		-	
	28-May-2015			-	-	-				-	-	-	-	-			-		-	
	8-Jun-2016			-	-	-				-	-	-	-	-			-		-	
	7-Jun-2017			-	-	-				-	-	-	-	-			-		-	
	26-Jun-2018			-	-	-				-	-	-	-	-			-		-	
	12-Jun-2019			<0.00050	<0.00050	<0.0020				<0.00050	<0.00050	<0.0010	<0.00050	<0.0020			<0.0010		<0.00020	
	4-Jun-2020			<0.00050	<0.00050	<0.0020				<0.00050	<0.00050	<0.0010	<0.00050	<0.0020			<0.0010		<0.00020	
	4-Jun-2021	<0.0010	<0.0010	<0.0010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	10-Jun-2022	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00020	<0.00050	<0.00050	<0.00050	<0.0020	<0.00050	<0.00050	<0.00050	<0.00050	<0.00020	<0.00050
	15-May-2023	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
MW18A	30-May-2014			-	-	-				-	-	-	-	-			-		-	
	28-May-2015			-	-	-				-	-	-	-	-			-		-	
	8-Jun-2016			-	-	-				-	-	-	-	-			-		-	
	7-Jun-2017			-	-	-				-	-	-	-	-			-		-	
	26-Jun-2018			-	-	-				-	-	-	-	-			-		-	
	12-Jun-2019			<0.00050	<0.00050	<0.0020				<0.00050	<0.00050	<0.0010	<0.00050	<0.0020			<0.0010		<0.00020	
	4-Jun-2020			<0.00050	<0.00050	<0.0020				<0.00050	<0.00050	<0.0010	<0.00050	<0.0020			<0.0010		<0.00020	
	4-Jun-2021	<0.0010	<0.0010	<0.0010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	10-Jun-2022	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00020	<0.00050	<0.00050	<0.00050	<0.0020	<0.00050	<0.00050	<0.00050	<0.00050	<0.00020	<0.00050
	15-Jun-2023	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
MW19A	30-May-2014			-	-	-				-	-	-	-	-			-		-	
	28-May-2015			-	-	-				-	-	-	-	-			-		-	
	8-Jun-2016			-	-	-				-	-	-	-	-			-		-	
	7-Jun-2017			-	-	-				-	-	-	-	-			-		-	
	26-Jun-2018			-	-	-				-	-	-	-	-			-		-	
	12-Jun-2019			<0.00050	<0.00050	<0.0020				<0.00050	<0.00050	<0.0010	<0.00050	<0.0020			<0.0010		<0.00020	
	4-Jun-2020			<0.00050	<0.00050	<0.0020				<0.00050	<0.00050	<0.0010	<0.00050	<0.0020			<0.0010		<0.00020	
	4-Jun-2021	<0.0010	<0.0010	<0.0010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	10-Jun-2022	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00020	<0.00050	<0.00050	<0.00050	<0.0020	<0.00050	<0.00050	<0.00050	<0.00050	<0.00020	<0.00050
	15-Jun-2023	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
MW20A	30-May-2014			-	-	-				-	-	-	-	-			-		-	
	28-May-2015			-	-	-				-	-	-	-	-			-		-	
	8-Jun-2016			-	-	-				-	-	-	-	-			-		-	
	7-Jun-2017			-	-	-				-	-	-	-	-			-		-	
	26-Jun-2018			-	-	-				-	-	-	-	-			-		-	
	12-Jun-2019			<0.00050	<0.00050	<0.0020				<0.00050	<0.00050	<0.0010	<0.00050	<0.0020			<0.0010		<0.00020	
	4-Jun-2020			<0.00050	<0.00050	<0.0020				<0.00050	<0.00050	<0.0010	<0.00050	<0.0020			<0.0010		<0.00020	
	3-Jun-2021	<0.0010	<0.0010	<0.0010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	10-Jun-2022	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00020	<0.00050	<0.00050	<0.00050	<0.0020	<0.00050	<0.00050	<0.00050	<0.00050	<0.00020	<0.00050
	15-Jun-2023	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010

Monitoring Well	Date	1,2-Dichlorobenzene	1,3-Dichlorobenzene	1,4-Dichlorobenzene	1,1-Dichloroethane	1,2-Dichloroethane	1,1-Dichloroethene	1,2-Dichloroethene (cis)	1,2-Dichloroethene (trans)	Dichlorodifluoromethane	1,2-Dichloropropane	1,3-Dichloropropane	2,2-Dichloropropane	1,1-Dichloropropene	1,3-Dichloropropene [cis]	1,3-Dichloropropene [trans]	Hexachlorobutadiene	p-Isopropyltoluene	Methyl t-Butyl Ether (MTBE)
Unit		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		0.0007	-	0.001	-	0.005	0.014	-	-	-	-	-	-	-	-	-	-	-	0.015
MW1B	6-Jun-2014	-	-	-	-	-	-	-	-		-				-	-			-
	28-May-2015	-	-	-	-	-	-	-	-		-				-	-			-
	8-Jun-2016	-	-	-	-	-	-	-	-		-				-	-			-
	7-Jun-2017	-	-	-	-	-	-	-	-		-				-	-			-
	26-Jun-2018	-	-	-	-	-	-	-	-		-				-	-			-
	12-Jun-2019	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050		<0.00050				<0.00050	<0.00050			<0.00050
	5-Jun-2020	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050		<0.00050				<0.00050	<0.00050			<0.00050
	4-Jun-2021	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050
	10-Jun-2022	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	15-Jun-2023	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0015	<0.0010	<0.0010	<0.0010	<0.0010
MW8A	30-May-2014	-	-	-	-	-	-	-	-		-				-	-			-
	28-May-2015	-	-	-	-	-	-	-	-		-				-	-			-
	8-Jun-2016	-	-	-	-	-	-	-	-		-				-	-			-
	7-Jun-2017	-	-	-	-	-	-	-	-		-				-	-			-
	26-Jun-2018	-	-	-	-	-	-	-	-		-				-	-			-
	12-Jun-2019	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050		<0.00050				<0.00050	<0.00050			<0.00050
	29-May-2020	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050		<0.00050				<0.00050	<0.00050			<0.00050
	4-Jun-2021	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050
	10-Jun-2022	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	15-Jun-2023	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0015	<0.0010	<0.0010	<0.0010	<0.0010
MW12B	30-May-2014	-	-	-	-	-	-	-	-		-				-	-			-
	28-May-2015	-	-	-	-	-	-	-	-		-				-	-			-
	8-Jun-2016	-	-	-	-	-	-	-	-		-				-	-			-
	7-Jun-2017	-	-	-	-	-	-	-	-		-				-	-			-
	26-Jun-2018	-	-	-	-	-	-	-	-		-				-	-			-
	12-Jun-2019	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050		<0.00050				<0.00050	<0.00050			<0.00050
	4-Jun-2020	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050		<0.00050				<0.00050	<0.00050			<0.00050
	4-Jun-2021	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050
	10-Jun-2022	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	15-May-2023	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0015	<0.0010	<0.0010	<0.0010	<0.0010
MW18A	30-May-2014	-	-	-	-	-	-	-	-		-				-	-			-
	28-May-2015	-	-	-	-	-	-	-	-		-				-	-			-
	8-Jun-2016	-	-	-	-	-	-	-	-		-				-	-			-
	7-Jun-2017	-	-	-	-	-	-	-	-		-				-	-			-
	26-Jun-2018	-	-	-	-	-	-	-	-		-				-	-			-
	12-Jun-2019	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050		<0.00050				<0.00050	<0.00050			<0.00050
	4-Jun-2020	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050		<0.00050				<0.00050	<0.00050			<0.00050
	4-Jun-2021	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050
	10-Jun-2022	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	15-Jun-2023	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0015	<0.0010	<0.0010	<0.0010	<0.0010
MW19A	30-May-2014	-	-	-	-	-	-	-	-		-				-	-			-
	28-May-2015	-	-	-	-	-	-	-	-		-				-	-			-
	8-Jun-2016	-	-	-	-	-	-	-	-		-				-	-			-
	7-Jun-2017	-	-	-	-	-	-	-	-		-				-	-			-
	26-Jun-2018	-	-	-	-	-	-	-	-		-				-	-			-
	12-Jun-2019	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050		<0.00050				<0.00050	<0.00050			<0.00050
	4-Jun-2020	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050		<0.00050				<0.00050	<0.00050			<0.00050
	4-Jun-2021	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050
	10-Jun-2022	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	15-Jun-2023	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0015	<0.0010	<0.0010	<0.0010	<0.0010
MW20A	30-May-2014	-	-	-	-	-	-	-	-		-				-	-			-
	28-May-2015	-	-	-	-	-	-	-	-		-				-	-			-
	8-Jun-2016	-	-	-	-	-	-	-	-		-				-	-			-
	7-Jun-2017	-	-	-	-	-	-	-	-		-				-	-			-
	26-Jun-2018	-	-	-	-	-	-	-	-		-				-	-			-
	12-Jun-2019	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050		<0.00050				<0.00050	<0.00050			<0.00050
	4-Jun-2020	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050		<0.00050				<0.00050	<0.00050			<0.00050
	3-Jun-2021	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050
	10-Jun-2022	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	15-Jun-2023	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0015	<0.0010	<0.0010	<0.0010	<0.0010

Monitoring Well	Date	Methylene Chloride	Methyl Methacrylate	iso-Propylbenzene (cumene)	n-Propylbenzene	1,1,1,2-Tetrachloroethane	1,1,2,2-Tetrachloroethane	Tetrachloroethene	1,2,3-Trichlorobenzene	1,2,4-Trichlorobenzene	1,3,5-Trichlorobenzene	1,1,1-Trichloroethane	1,1,2-Trichloroethane	Trichloroethene	Trichlorofluoromethane	Trihalomethanes	1,2,3-Trichloropropane	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	Vinyl chloride
Unit		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		0.05	0.47	-	-	-	-	0.01	0.008	0.015	0.014	-	-	0.005	-	0.1	-	-	-	0.002
MW1B	6-Jun-2014	-	-			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	28-May-2015	-	-			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	8-Jun-2016	-	-			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	7-Jun-2017	-	-			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	26-Jun-2018	<0.0020	-			-	-	<0.00050	-	-	-	-	-	<0.00050	-	-		-	-	<0.00050
	12-Jun-2019	<0.0020	<0.00050			<0.0010	<0.0020	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0013		<0.00050	<0.00050	<0.00050
	5-Jun-2020	<0.0020	<0.00050			<0.0010	<0.0020	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0013		<0.00050	<0.00050	<0.00050
	4-Jun-2021	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0020	<0.0010	<0.0010	<0.0010
	10-Jun-2022	<0.0010	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	-	<0.00050	<0.00050	<0.00050	<0.00050	-	<0.00050	<0.00050	<0.00050	<0.00050
	15-Jun-2023	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010	<0.0010
MW8A	30-May-2014	-	-			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	28-May-2015	-	-			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	8-Jun-2016	-	-			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	7-Jun-2017	-	-			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	26-Jun-2018	<0.0020	-			-	-	<0.00050	-	-	-	-	-	<0.00050	-	-		-	-	<0.00050
	12-Jun-2019	<0.0020	<0.00050			<0.0010	<0.0020	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0013		<0.00050	<0.00050	<0.00050
	29-May-2020	<0.0020	<0.00050			<0.0010	<0.0020	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0013		<0.00050	<0.00050	<0.00050
	4-Jun-2021	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0020	<0.0010	<0.0010	<0.0010
	10-Jun-2022	<0.0010	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	-	<0.00050	<0.00050	<0.00050	<0.00050	-	<0.00050	<0.00050	<0.00050	<0.00050
	15-Jun-2023	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010	<0.0010
MW12B	30-May-2014	-	-			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	28-May-2015	-	-			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	8-Jun-2016	-	-			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	7-Jun-2017	-	-			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	26-Jun-2018	<0.0020	-			-	-	<0.00050	-	-	-	-	-	<0.00050	-	-		-	-	<0.00050
	12-Jun-2019	<0.0020	<0.00050			<0.0010	<0.0020	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0013		<0.00050	<0.00050	<0.00050
	4-Jun-2020	<0.0020	<0.00050			<0.0010	<0.0020	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0013		<0.00050	<0.00050	<0.00050
	4-Jun-2021	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0020	<0.0010	<0.0010	<0.0010
	10-Jun-2022	<0.0010	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	-	<0.00050	<0.00050	<0.00050	<0.00050	-	<0.00050	<0.00050	<0.00050	<0.00050
	15-May-2023	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010	<0.0010
MW18A	30-May-2014	-	-			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	28-May-2015	-	-			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	8-Jun-2016	-	-			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	7-Jun-2017	-	-			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	26-Jun-2018	<0.0020	-			-	-	<0.00050	-	-	-	-	-	<0.00050	-	-		-	-	<0.00050
	12-Jun-2019	<0.0020	<0.00050			<0.0010	<0.0020	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0013		<0.00050	<0.00050	<0.00050
	4-Jun-2020	<0.0020	<0.00050			<0.0010	<0.0020	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0013		<0.00050	<0.00050	<0.00050
	4-Jun-2021	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0020	<0.0010	<0.0010	<0.0010
	10-Jun-2022	<0.0010	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	-	<0.00050	<0.00050	<0.00050	<0.00050	-	<0.00050	<0.00050	<0.00050	<0.00050
	15-Jun-2023	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010	<0.0010
MW19A	30-May-2014	-	-			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	28-May-2015	-	-			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	8-Jun-2016	-	-			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	7-Jun-2017	-	-			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	26-Jun-2018	<0.0020	-			-	-	<0.00050	-	-	-	-	-	<0.00050	-	-		-	-	<0.00050
	12-Jun-2019	<0.0020	<0.00050			<0.0010	<0.0020	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0013		<0.00050	<0.00050	<0.00050
	4-Jun-2020	<0.0020	<0.00050			<0.0010	<0.0020	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0013		<0.00050	<0.00050	<0.00050
	4-Jun-2021	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0020	<0.0010	<0.0010	<0.0010
	10-Jun-2022	<0.0010	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	-	<0.00050	<0.00050	<0.00050	<0.00050	-	<0.00050	<0.00050	<0.00050	<0.00050
	15-Jun-2023	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010	<0.0010
MW20A	30-May-2014	-	-			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	28-May-2015	-	-			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	8-Jun-2016	-	-			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	7-Jun-2017	-	-			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	26-Jun-2018	<0.0020	-			-	-	<0.00050	-	-	-	-	-	<0.00050	-	-		-	-	<0.00050
	12-Jun-2019	<0.0020	<0.00050			<0.0010	<0.0020	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0013		<0.00050	<0.00050	<0.00050
	4-Jun-2020	<0.0020	<0.00050			<0.0010	<0.0020	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0013		<0.00050	<0.00050	<0.00050
	3-Jun-2021	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0020	<0.0010	<0.0010	<0.0010
	10-Jun-2022	<0.0010	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	-	<0.00050	<0.00050	<0.00050	<0.00050	-	<0.00050	<0.00050	<0.00050	<0.00050
	15-Jun-2023	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010	<0.0010

Notes:

[1] Alberta Environment and Parks (AEP). 2022. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. ISBN 978-1-4601-5501-1. Referenced guidelines are for fine textured soils under Agricultural land use

[2] Alberta Environment and Parks (AEP). Environmental Quality Guidelines for Alberta Surface Waters. March 2018. Table 1 Surface water quality guidelines for the protection of freshwater aquatic life (PAL). Most conservative values applied (chronic or acute).

[3] Guideline varies with hardness.

[4] Guideline varies with pH and temperature.

[5] Guideline varies with chloride.

[6] Guideline varies with pH.

"-" No applicable guideline or not analyzed.

BOLD - Greater than Tier 1 Guideline.

Italic - Detection limit greater than Tier 1 guideline.

* - laboratory filtered.

Table 4c: Field and Groundwater Analytical Results Summary - Clay Shale Wells

Parameter Group: Volatile Organic Compounds (VOCs)

Monitoring Well	Date	Bromobenzene	Bromochloromethane	Bromodichloromethane	Bromoform	Bromomethane	n-Butylbenzene	sec-Butylbenzene	tert-Butylbenzene	Carbon tetrachloride	Chlorobenzene	Chloroethane	Chloroform	Chloromethane	2-Chlorotoluene	4-Chlorotoluene	Dibromochloromethane	1,2-Dibromo-3-chloropropane	1,2-Dibromoethane	Dibromomethane
Unit		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		-	-	-	-	-	-	-	-	0.002	0.0013	-	0.08	-	-	-	0.1	-	-	0.1
MW21A	6-Jun-2014			-	-	-				-	-	-	-	-			-		-	
	4-Jun-2015			-	-	-				-	-	-	-	-			-		-	
	8-Jun-2016			-	-	-				-	-	-	-	-			-		-	
	7-Jun-2017			-	-	-				-	-	-	-	-			-		-	
	26-Jun-2018			-	-	-				-	-	-	-	-			-		-	
	17-Jun-2019			<0.00050	<0.00050	<0.0020				<0.00050	<0.00050	<0.0010	<0.00050	<0.0020			<0.0010		<0.00020	
	5-Jun-2020			<0.00050	<0.00050	<0.0020				<0.00050	<0.00050	<0.0010	<0.00050	<0.0020			<0.0010		<0.00020	
	3-Jun-2021	<0.0010	<0.0010	<0.0010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	10-Jun-2022	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00020	<0.00050	<0.00050	<0.00050	<0.0020	<0.00050	<0.00050	<0.00050	<0.00050	<0.00020	<0.00050
	15-Jun-2023	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
MW22A	6-Jun-2014			-	-	-				-	-	-	-	-			-		-	
	4-Jun-2015			-	-	-				-	-	-	-	-			-		-	
	8-Jun-2016			-	-	-				-	-	-	-	-			-		-	
	7-Jun-2017			-	-	-				-	-	-	-	-			-		-	
	26-Jun-2018			-	-	-				-	-	-	-	-			-		-	
	17-Jun-2019			<0.00050	<0.00050	<0.0020				<0.00050	<0.00050	<0.0010	<0.00050	<0.0020			<0.0010		<0.00020	
	5-Jun-2020			<0.00050	<0.00050	<0.0020				<0.00050	<0.00050	<0.0010	<0.00050	<0.0020			<0.0010		<0.00020	
	3-Jun-2021	<0.0010	<0.0010	<0.0010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	10-Jun-2022	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00020	<0.00050	<0.00050	<0.00050	<0.0020	<0.00050	<0.00050	<0.00050	<0.00050	<0.00020	<0.00050
	16-Jun-2023	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
MW23A	30-May-2014			-	-	-				-	-	-	-	-			-		-	
	4-Jun-2015			-	-	-				-	-	-	-	-			-		-	
	8-Jun-2016			-	-	-				-	-	-	-	-			-		-	
	7-Jun-2017			-	-	-				-	-	-	-	-			-		-	
	26-Jun-2018			-	-	-				-	-	-	-	-			-		-	
	17-Jun-2019			<0.00050	<0.00050	<0.0020				<0.00050	<0.00050	<0.0010	<0.00050	<0.0020			<0.0010		<0.00020	
	5-Jun-2020			<0.00050	<0.00050	<0.0020				<0.00050	<0.00050	<0.0010	<0.00050	<0.0020			<0.0010		<0.00020	
	3-Jun-2021	<0.0010	<0.0010	<0.0010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	10-Jun-2022	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00020	<0.00050	<0.00050	<0.00050	<0.0020	<0.00050	<0.00050	<0.00050	<0.00050	<0.00020	<0.00050
	16-Jun-2023	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
MW25A	6-Jun-2014			-	-	-				-	-	-	-	-			-		-	
	4-Jun-2015			-	-	-				-	-	-	-	-			-		-	
	8-Jun-2016			-	-	-				-	-	-	-	-			-		-	
	7-Jun-2017			-	-	-				-	-	-	-	-			-		-	
	26-Jun-2018			-	-	-				-	-	-	-	-			-		-	
	17-Jun-2019			<0.00050	<0.00050	<0.0020				<0.00050	<0.00050	<0.0010	<0.00050	<0.0020			<0.0010		<0.00020	
	5-Jun-2020			<0.00050	<0.00050	<0.0020				<0.00050	<0.00050	<0.0010	<0.00050	<0.0020			<0.0010		<0.00020	
	3-Jun-2021	<0.0010	<0.0010	<0.0010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	10-Jun-2022	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00020	<0.00050	<0.00050	<0.00050	<0.0020	<0.00050	<0.00050	<0.00050	<0.00050	<0.00020	<0.00050
	16-Jun-2023	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
MW26A	6-Jun-2014			-	-	-				-	-	-	-	-			-		-	
	4-Jun-2015			-	-	-				-	-	-	-	-			-		-	
	8-Jun-2016			-	-	-				-	-	-	-	-			-		-	
	7-Jun-2017			-	-	-				-	-	-	-	-			-		-	
	26-Jun-2018			-	-	-				-	-	-	-	-			-		-	
	17-Jun-2019			<0.00050	<0.00050	<0.0020				<0.00050	<0.00050	<0.0010	<0.00050	<0.0020			<0.0010		<0.00020	
	5-Jun-2020			-	-	-				-	-	-	-	-			-		-	
	3-Jun-2021	<0.0010	<0.0010	<0.0010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	10-Jun-2022	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00020	<0.00050	<0.00050	<0.00050	<0.0020	<0.00050	<0.00050	<0.00050	<0.00050	<0.00020	<0.00050
	16-Jun-2023	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
MW27A	30-May-2014			-	-	-				-	-	-	-	-			-		-	
	4-Jun-2015			-	-	-				-	-	-	-	-			-		-	
	8-Jun-2016			-	-	-				-	-	-	-	-			-		-	
	7-Jun-2017			-	-	-				-	-	-	-	-			-		-	
	26-Jun-2018			-	-	-				-	-	-	-	-			-		-	
	17-Jun-2019			<0.00050	<0.00050	<0.0020				<0.00050	<0.00050	<0.0010	<0.00050	<0.0020			<0.0010		<0.00020	
	4-Jun-2020			<0.00050	<0.00050	<0.0020				<0.00050	<0.00050	<0.0010	<0.00050	<0.0020			<0.0010		<0.00020	
	2-Jun-2021	<0.0010	<0.0010	<0.0010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	10-Jun-2022	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00020	<0.00050	<0.00050	<0.00050	<0.0020	<0.00050	<0.00050	<0.00050	<0.00050	<0.00020	<0.00050
	16-Jun-2023	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010

Monitoring Well	Date	1,2-Dichlorobenzene	1,3-Dichlorobenzene	1,4-Dichlorobenzene	1,1-Dichloroethane	1,2-Dichloroethane	1,1-Dichloroethene	1,2-Dichloroethene (cis)	1,2-Dichloroethene (trans)	Dichlorodifluoromethane	1,2-Dichloropropane	1,3-Dichloropropane	2,2-Dichloropropane	1,1-Dichloropropene	1,3-Dichloropropene [cis]	1,3-Dichloropropene [trans]	Hexachlorobutadiene	p-Isopropyltoluene	Methyl t-Butyl Ether (MTBE)
Unit		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		0.0007	-	0.001	-	0.005	0.014	-	-	-	-	-	-	-	-	-	-	-	0.015
MW21A	6-Jun-2014	-	-	-	-	-	-	-	-		-				-	-			-
	4-Jun-2015	-	-	-	-	-	-	-	-		-				-	-			-
	8-Jun-2016	-	-	-	-	-	-	-	-		-				-	-			-
	7-Jun-2017	-	-	-	-	-	-	-	-		-				-	-			-
	26-Jun-2018	-	-	-	-	-	-	-	-		-				-	-			-
	17-Jun-2019	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050		<0.00050				<0.00050	<0.00050			<0.00050
	5-Jun-2020	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050		<0.00050				<0.00050	<0.00050			<0.00050
	3-Jun-2021	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050
	10-Jun-2022	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	15-Jun-2023	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0015	<0.0010	<0.0010	<0.0010	<0.0010
MW22A	6-Jun-2014	-	-	-	-	-	-	-	-		-				-	-			-
	4-Jun-2015	-	-	-	-	-	-	-	-		-				-	-			-
	8-Jun-2016	-	-	-	-	-	-	-	-		-				-	-			-
	7-Jun-2017	-	-	-	-	-	-	-	-		-				-	-			-
	26-Jun-2018	-	-	-	-	-	-	-	-		-				-	-			-
	17-Jun-2019	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050		<0.00050				<0.00050	<0.00050			<0.00050
	5-Jun-2020	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050		<0.00050				<0.00050	<0.00050			<0.00050
	3-Jun-2021	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050
	10-Jun-2022	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	16-Jun-2023	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0015	<0.0010	<0.0010	<0.0010	<0.0010
MW23A	30-May-2014	-	-	-	-	-	-	-	-		-				-	-			-
	4-Jun-2015	-	-	-	-	-	-	-	-		-				-	-			-
	8-Jun-2016	-	-	-	-	-	-	-	-		-				-	-			-
	7-Jun-2017	-	-	-	-	-	-	-	-		-				-	-			-
	26-Jun-2018	-	-	-	-	-	-	-	-		-				-	-			-
	17-Jun-2019	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050		<0.00050				<0.00050	<0.00050			<0.00050
	5-Jun-2020	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050		<0.00050				<0.00050	<0.00050			<0.00050
	3-Jun-2021	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050
	10-Jun-2022	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	16-Jun-2023	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0015	<0.0010	<0.0010	<0.0010	<0.0010
MW25A	6-Jun-2014	-	-	-	-	-	-	-	-		-				-	-			-
	4-Jun-2015	-	-	-	-	-	-	-	-		-				-	-			-
	8-Jun-2016	-	-	-	-	-	-	-	-		-				-	-			-
	7-Jun-2017	-	-	-	-	-	-	-	-		-				-	-			-
	26-Jun-2018	-	-	-	-	-	-	-	-		-				-	-			-
	17-Jun-2019	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050		<0.00050				<0.00050	<0.00050			<0.00050
	5-Jun-2020	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050		<0.00050				<0.00050	<0.00050			<0.00050
	3-Jun-2021	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050
	10-Jun-2022	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	16-Jun-2023	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0015	<0.0010	<0.0010	<0.0010	<0.0010
MW26A	6-Jun-2014	-	-	-	-	-	-	-	-		-				-	-			-
	4-Jun-2015	-	-	-	-	-	-	-	-		-				-	-			-
	8-Jun-2016	-	-	-	-	-	-	-	-		-				-	-			-
	7-Jun-2017	-	-	-	-	-	-	-	-		-				-	-			-
	26-Jun-2018	-	-	-	-	-	-	-	-		-				-	-			-
	17-Jun-2019	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050		<0.00050				<0.00050	<0.00050			<0.00050
	5-Jun-2020	-	-	-	-	-	-	-	-		-				-	-			-
	3-Jun-2021	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050
	10-Jun-2022	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	16-Jun-2023	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0015	<0.0010	<0.0010	<0.0010	<0.0010
MW27A	30-May-2014	-	-	-	-	-	-	-	-		-				-	-			-
	4-Jun-2015	-	-	-	-	-	-	-	-		-				-	-			-
	8-Jun-2016	-	-	-	-	-	-	-	-		-				-	-			-
	7-Jun-2017	-	-	-	-	-	-	-	-		-				-	-			-
	26-Jun-2018	-	-	-	-	-	-	-	-		-				-	-			-
	17-Jun-2019	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050		<0.00050				<0.00050	<0.00050			<0.00050
	4-Jun-2020	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050		<0.00050				<0.00050	<0.00050			<0.00050
	2-Jun-2021	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050
	10-Jun-2022	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	16-Jun-2023	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0015	<0.0010	<0.0010	<0.0010	<0.0010

Monitoring Well	Date	Methylene Chloride	Methyl Methacrylate	iso-Propylbenzene (cumene)	n-Propylbenzene	1,1,1,2-Tetrachloroethane	1,1,2,2-Tetrachloroethane	Tetrachloroethene	1,2,3-Trichlorobenzene	1,2,4-Trichlorobenzene	1,3,5-Trichlorobenzene	1,1,1-Trichloroethane	1,1,2-Trichloroethane	Trichloroethene	Trichlorofluoromethane	Trihalomethanes	1,2,3-Trichloropropane	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	Vinyl chloride
Unit		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		0.05	0.47	-	-	-	-	0.01	0.008	0.015	0.014	-	-	0.005	-	0.1	-	-	-	0.002
MW21A	6-Jun-2014	-	-			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	4-Jun-2015	-	-			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	8-Jun-2016	-	-			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	7-Jun-2017	-	-			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	26-Jun-2018	<0.0020	-			-	-	<0.00050	-	-	-	-	-	<0.00050	-	-		-	-	<0.00050
	17-Jun-2019	<0.0020	<0.00050			<0.0010	<0.0020	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0013		<0.00050	<0.00050	<0.00050
	5-Jun-2020	<0.0020	<0.00050			<0.0010	<0.0020	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0013		<0.00050	<0.00050	<0.00050
	3-Jun-2021	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0020	<0.0010	<0.0010	<0.0010
	10-Jun-2022	<0.0010	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	-	<0.00050	<0.00050	<0.00050	<0.00050	-	<0.00050	<0.00050	<0.00050	<0.00050
	15-Jun-2023	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010	<0.0010
MW22A	6-Jun-2014	-	-			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	4-Jun-2015	-	-			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	8-Jun-2016	-	-			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	7-Jun-2017	-	-			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	26-Jun-2018	<0.0020	-			-	-	<0.00050	-	-	-	-	-	<0.00050	-	-		-	-	<0.00050
	17-Jun-2019	<0.0020	<0.00050			<0.0010	<0.0020	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0013		<0.00050	<0.00050	<0.00050
	5-Jun-2020	<0.0020	<0.00050			<0.0010	<0.0020	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0013		<0.00050	<0.00050	<0.00050
	3-Jun-2021	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0020	<0.0010	<0.0010	<0.0010
	10-Jun-2022	<0.0010	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	-	<0.00050	<0.00050	<0.00050	<0.00050	-	<0.00050	<0.00050	<0.00050	<0.00050
	16-Jun-2023	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010	<0.0010
MW23A	30-May-2014	-	-			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	4-Jun-2015	-	-			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	8-Jun-2016	-	-			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	7-Jun-2017	-	-			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	26-Jun-2018	<0.0020	-			-	-	<0.00050	-	-	-	-	-	<0.00050	-	-		-	-	<0.00050
	17-Jun-2019	<0.0020	<0.00050			<0.0010	<0.0020	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0013		<0.00050	<0.00050	<0.00050
	5-Jun-2020	<0.0020	<0.00050			<0.0010	<0.0020	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0013		<0.00050	<0.00050	<0.00050
	3-Jun-2021	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0020	<0.0010	<0.0010	<0.0010
	10-Jun-2022	<0.0010	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	-	<0.00050	<0.00050	<0.00050	<0.00050	-	<0.00050	<0.00050	<0.00050	<0.00050
	16-Jun-2023	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010	<0.0010
MW25A	6-Jun-2014	-	-			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	4-Jun-2015	-	-			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	8-Jun-2016	-	-			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	7-Jun-2017	-	-			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	26-Jun-2018	<0.0020	-			-	-	<0.00050	-	-	-	-	-	<0.00050	-	-		-	-	<0.00050
	17-Jun-2019	<0.0020	<0.00050			<0.0010	<0.0020	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0013		<0.00050	<0.00050	<0.00050
	5-Jun-2020	<0.0020	<0.00050			<0.0010	<0.0020	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0013		<0.00050	<0.00050	<0.00050
	3-Jun-2021	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0020	<0.0010	<0.0010	<0.0010
	10-Jun-2022	<0.0010	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	-	<0.00050	<0.00050	<0.00050	<0.00050	-	<0.00050	<0.00050	<0.00050	<0.00050
	16-Jun-2023	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010	<0.0010
MW26A	6-Jun-2014	-	-			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	4-Jun-2015	-	-			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	8-Jun-2016	-	-			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	7-Jun-2017	-	-			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	26-Jun-2018	<0.0020	-			-	-	<0.00050	-	-	-	-	-	<0.00050	-	-		-	-	<0.00050
	17-Jun-2019	<0.0020	<0.00050			<0.0010	<0.0020	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0013		<0.00050	<0.00050	<0.00050
	5-Jun-2020	-	-			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	3-Jun-2021	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0020	<0.0010	<0.0010	<0.0010
	10-Jun-2022	<0.0010	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	-	<0.00050	<0.00050	<0.00050	<0.00050	-	<0.00050	<0.00050	<0.00050	<0.00050
	16-Jun-2023	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010	<0.0010
MW27A	30-May-2014	-	-			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	4-Jun-2015	-	-			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	8-Jun-2016	-	-			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	7-Jun-2017	-	-			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	26-Jun-2018	<0.0020	-			-	-	<0.00050	-	-	-	-	-	<0.00050	-	-		-	-	<0.00050
	17-Jun-2019	<0.0020	<0.00050			<0.0010	<0.0020	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0013		<0.00050	<0.00050	<0.00050
	4-Jun-2020	<0.0020	<0.00050			<0.0010	<0.0020	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0013		<0.00050	<0.00050	<0.00050
	2-Jun-2021	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0020	<0.0010	<0.0010	<0.0010
	10-Jun-2022	<0.0010	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	-	<0.00050	<0.00050	<0.00050	<0.00050	-	<0.00050	<0.00050	<0.00050	<0.00050
	16-Jun-2023	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010	<0.0010

Notes:

[1] Alberta Environment and Parks (AEP). 2022. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. ISBN 978-1-4601-5501-1. Referenced guidelines are for fine textured soils under Agricultural land use

[2] Alberta Environment and Parks (AEP). Environmental Quality Guidelines for Alberta Surface Waters. March 2018. Table 1 Surface water quality guidelines for the protection of freshwater aquatic life (PAL). Most conservative values applied (chronic or acute).

[3] Guideline varies with hardness.

[4] Guideline varies with pH and temperature.

[5] Guideline varies with chloride.

[6] Guideline varies with pH.

"-" No applicable guideline or not analyzed.

BOLD - Greater than Tier 1 Guideline.

Italic - Detection limit greater than Tier 1 guideline.

* - laboratory filtered.

Table 4c: Field and Groundwater Analytical Results Summary - Clay Shale Wells

Parameter Group: Volatile Organic Compounds (VOCs)

Monitoring Well	Date	Bromobenzene	Bromochloromethane	Bromodichloromethane	Bromoform	Bromomethane	n-Butylbenzene	sec-Butylbenzene	tert-Butylbenzene	Carbon tetrachloride	Chlorobenzene	Chloroethane	Chloroform	Chloromethane	2-Chlorotoluene	4-Chlorotoluene	Dibromochloromethane	1,2-Dibromo-3-chloropropane
Unit		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		-	-	-	-	-	-	-	-	0.002	0.0013	-	0.08	-	-	-	0.1	-
MW28A	30-May-2014			-	-	-				-	-	-	-	-			-	
	4-Jun-2015			-	-	-				-	-	-	-	-			-	
	8-Jun-2016			-	-	-				-	-	-	-	-			-	
	7-Jun-2017			-	-	-				-	-	-	-	-			-	
	26-Jun-2018			-	-	-				-	-	-	-	-			-	
	17-Jun-2019			<0.00050	<0.00050	<0.0020				<0.00050	<0.00050	<0.0010	<0.00050	<0.0020			<0.0010	
	4-Jun-2020			<0.00050	<0.00050	<0.0020				<0.00050	<0.00050	<0.0010	<0.00050	<0.0020			<0.0010	
	2-Jun-2021	<0.0010	<0.0010	<0.0010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.0010
	10-Jun-2022	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00020	<0.00050	<0.00050	<0.00050	<0.0020	<0.00050	<0.00050	<0.00050	<0.00050
	16-Jun-2023	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0010
MW32A	4-Jun-2015			-	-	-				-	-	-	-	-			-	
	8-Jun-2016			-	-	-				-	-	-	-	-			-	
	7-Jun-2017			-	-	-				-	-	-	-	-			-	
	26-Jun-2018			-	-	-				-	-	-	-	-			-	
	12-Jun-2019			<0.00050	<0.00050	<0.0020				<0.00050	<0.00050	<0.0010	<0.00050	<0.0020			<0.0010	
	29-May-2020			<0.00050	<0.00050	<0.0020				<0.00050	<0.00050	<0.0010	<0.00050	<0.0020			<0.0010	
	4-Jun-2021	<0.0010	<0.0010	<0.0010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.0010
	10-Jun-2022	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00020	<0.00050	<0.00050	<0.00050	<0.0020	<0.00050	<0.00050	<0.00050	<0.00050
	16-Jun-2023	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0010
15MW35A	8-Jun-2016			-	-	-				-	-	-	-	-			-	
	7-Jun-2017			-	-	-				-	-	-	-	-			-	
	26-Jun-2018			-	-	-				-	-	-	-	-			-	
	17-Jun-2019			<0.00050	<0.00050	<0.0020				<0.00050	<0.00050	<0.0010	<0.00050	<0.0020			<0.0010	
	5-Jun-2020			-	-	-				-	-	-	-	-			-	
	3-Jun-2021	<0.0010	<0.0010	<0.0010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.0010
	9-Jun-2022	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00020	<0.00050	<0.00050	<0.00050	<0.0020	<0.00050	<0.00050	<0.00050	<0.00050
	16-Jun-2023	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0010
15MW36A	8-Jun-2016			-	-	-				-	-	-	-	-			-	
	7-Jun-2017			-	-	-				-	-	-	-	-			-	
	26-Jun-2018			-	-	-				-	-	-	-	-			-	
	12-Jun-2019			<0.00050	<0.00050	<0.0020				<0.00050	<0.00050	<0.0010	<0.00050	<0.0020			<0.0010	
	5-Jun-2020			<0.00050	<0.00050	<0.0020				<0.00050	<0.00050	<0.0010	<0.00050	<0.0020			<0.0010	
	3-Jun-2021	<0.0010	<0.0010	<0.0010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.0010
	10-Jun-2022	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00020	<0.00050	<0.00050	<0.00050	<0.0020	<0.00050	<0.00050	<0.00050	<0.00050
	16-Jun-2023	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0010
19MW37A	15-Nov-2019			-	-	-				-	-	-	-	-			-	
	4-Jun-2020			<0.00050	<0.00050	<0.0020				<0.00050	<0.00050	<0.0010	<0.00050	<0.0020			<0.0010	
	15-May-2023	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0010
23MW38A	21-Dec-2023	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0010

Monitoring Well	Date	1,2-Dibromoethane	Dibromomethane	1,2-Dichlorobenzene	1,3-Dichlorobenzene	1,4-Dichlorobenzene	1,1-Dichloroethane	1,2-Dichloroethane	1,1-Dichloroethene	1,2-Dichloroethene (cis)	1,2-Dichloroethene (trans)	Dichlorodifluoromethane	1,2-Dichloropropane	1,3-Dichloropropane	2,2-Dichloropropane	1,1-Dichloropropene	1,3-Dichloropropene [cis]	1,3-Dichloropropene [trans]	Hexachlorobutadiene	p-Isopropyltoluene
Unit		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		-	0.1	0.0007	-	0.001	-	0.005	0.014	-	-	-	-	-	-	-	-	-	-	-
MW28A	30-May-2014	-		-	-	-	-	-	-	-	-		-				-	-		
	4-Jun-2015	-		-	-	-	-	-	-	-	-		-				-	-		
	8-Jun-2016	-		-	-	-	-	-	-	-	-		-				-	-		
	7-Jun-2017	-		-	-	-	-	-	-	-	-		-				-	-		
	26-Jun-2018	-		-	-	-	-	-	-	-	-		-				-	-		
	17-Jun-2019	<0.00020		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050		<0.00050				<0.00050	<0.00050		
	4-Jun-2020	<0.00020		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050		<0.00050				<0.00050	<0.00050		
	2-Jun-2021	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	10-Jun-2022	<0.00020	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	16-Jun-2023	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0015	<0.0010	<0.0010	<0.0010
MW32A	4-Jun-2015	-		-	-	-	-	-	-	-	-		-				-	-		
	8-Jun-2016	-		-	-	-	-	-	-	-	-		-				-	-		
	7-Jun-2017	-		-	-	-	-	-	-	-	-		-				-	-		
	26-Jun-2018	-		-	-	-	-	-	-	-	-		-				-	-		
	12-Jun-2019	<0.00020		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050		<0.00050				<0.00050	<0.00050		
	29-May-2020	<0.00020		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050		<0.00050				<0.00050	<0.00050		
	4-Jun-2021	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	10-Jun-2022	<0.00020	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	16-Jun-2023	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0015	<0.0010	<0.0010	<0.0010
15MW35A	8-Jun-2016	-		-	-	-	-	-	-	-	-		-				-	-		
	7-Jun-2017	-		-	-	-	-	-	-	-	-		-				-	-		
	26-Jun-2018	-		-	-	-	-	-	-	-	-		-				-	-		
	17-Jun-2019	<0.00020		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050		<0.00050				<0.00050	<0.00050		
	5-Jun-2020	-		-	-	-	-	-	-	-	-		-				-	-		
	3-Jun-2021	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	9-Jun-2022	<0.00020	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	16-Jun-2023	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0015	<0.0010	<0.0010	<0.0010
15MW36A	8-Jun-2016	-		-	-	-	-	-	-	-	-		-				-	-		
	7-Jun-2017	-		-	-	-	-	-	-	-	-		-				-	-		
	26-Jun-2018	-		-	-	-	-	-	-	-	-		-				-	-		
	12-Jun-2019	<0.00020		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050		<0.00050				<0.00050	<0.00050		
	5-Jun-2020	<0.00020		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050		<0.00050				<0.00050	<0.00050		
	3-Jun-2021	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	10-Jun-2022	<0.00020	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	16-Jun-2023	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0015	<0.0010	<0.0010	<0.0010
19MW37A	15-Nov-2019	-		-	-	-	-	<0.00050	-	-	-		-				-	-		
	4-Jun-2020	<0.00020		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050		<0.00050				<0.00050	<0.00050		
	15-May-2023	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0015	<0.0010	<0.0010	<0.0010
23MW38A	21-Dec-2023	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0015	<0.0010	<0.0010	<0.0010

Monitoring Well	Date	Methyl t-Butyl Ether (MTBE)	Methylene Chloride	Methyl Methacrylate	iso-Propylbenzene (cumene)	n-Propylbenzene	1,1,1,2-Tetrachloroethane	1,1,2,2-Tetrachloroethane	Tetrachloroethene	1,2,3-Trichlorobenzene	1,2,4-Trichlorobenzene	1,3,5-Trichlorobenzene	1,1,1-Trichloroethane	1,1,2-Trichloroethane	Trichloroethene	Trichlorofluoromethane	Trihalomethanes	1,2,3-Trichloropropane	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	Vinyl chloride
Unit		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		0.015	0.05	0.47	-	-	-	-	0.01	0.008	0.015	0.014	-	-	0.005	-	0.1	-	-	-	0.002
MW28A	30-May-2014	-	-	-			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	4-Jun-2015	-	-	-			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	8-Jun-2016	-	-	-			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	7-Jun-2017	-	-	-			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	26-Jun-2018	-	<0.0020	-			-	-	<0.00050	-	-	-	-	-	<0.00050	-	-		-	-	<0.00050
	17-Jun-2019	<0.00050	<0.0020	<0.00050			<0.0010	<0.0020	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0013		<0.00050	<0.00050	<0.00050
	4-Jun-2020	<0.00050	<0.0020	<0.00050			<0.0010	<0.0020	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0013		<0.00050	<0.00050	<0.00050
	2-Jun-2021	<0.00050	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0020	<0.0010	<0.0010	<0.0010
	10-Jun-2022	<0.00050	<0.0010	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	-	<0.00050	<0.00050	<0.00050	<0.00050	-	<0.00050	<0.00050	<0.00050	<0.00050
	16-Jun-2023	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010	<0.0010
MW32A	4-Jun-2015	-	-	-			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	8-Jun-2016	-	-	-			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	7-Jun-2017	-	-	-			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	26-Jun-2018	-	<0.0020	-			-	-	<0.00050	-	-	-	-	-	<0.00050	-	-		-	-	<0.00050
	12-Jun-2019	<0.00050	<0.0020	<0.00050			<0.0010	<0.0020	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0013		<0.00050	<0.00050	<0.00050
	29-May-2020	<0.00050	<0.0020	<0.00050			<0.0010	<0.0020	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0013		<0.00050	<0.00050	<0.00050
	4-Jun-2021	<0.00050	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0020	<0.0010	<0.0010	<0.0010
	10-Jun-2022	<0.00050	<0.0010	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	-	<0.00050	<0.00050	<0.00050	<0.00050	-	<0.00050	<0.00050	<0.00050	<0.00050
	16-Jun-2023	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010	<0.0010
15MW35A	8-Jun-2016	-	-	-			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	7-Jun-2017	-	-	-			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	26-Jun-2018	-	<0.0020	-			-	-	<0.00050	-	-	-	-	-	<0.00050	-	-		-	-	<0.00050
	17-Jun-2019	<0.00050	<0.0020	<0.00050			<0.0010	<0.0020	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0013		<0.00050	<0.00050	<0.00050
	5-Jun-2020	-	-	-			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	3-Jun-2021	<0.00050	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0020	<0.0010	<0.0010	<0.0010
	9-Jun-2022	<0.00050	<0.0010	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	-	<0.00050	<0.00050	<0.00050	<0.00050	-	<0.00050	<0.00050	<0.00050	<0.00050
	16-Jun-2023	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010	<0.0010
15MW36A	8-Jun-2016	-	-	-			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	7-Jun-2017	-	-	-			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	26-Jun-2018	-	<0.0020	-			-	-	<0.00050	-	-	-	-	-	<0.00050	-	-		-	-	<0.00050
	12-Jun-2019	<0.00050	<0.0020	<0.00050			<0.0010	<0.0020	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0013		<0.00050	<0.00050	<0.00050
	5-Jun-2020	<0.00050	<0.0020	<0.00050			<0.0010	<0.0020	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0013		<0.00050	<0.00050	<0.00050
	3-Jun-2021	<0.00050	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0020	<0.0010	<0.0010	<0.0010
	10-Jun-2022	<0.00050	<0.0010	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	-	<0.00050	<0.00050	<0.00050	<0.00050	-	<0.00050	<0.00050	<0.00050	<0.00050
	16-Jun-2023	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010	<0.0010
19MW37A	15-Nov-2019	-	-	-			-	-	<0.00050	-	-	-	-	-	<0.00050	-	-		-	-	<0.00050
	4-Jun-2020	<0.00050	<0.0020	<0.00050			<0.0010	<0.0020	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0013		<0.00050	<0.00050	<0.00050
	15-May-2023	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010	<0.0010
23MW38A	21-Dec-2023	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010	<0.0010

Notes:

[1] Alberta Environment and Parks (AEP). 2022. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. ISBN 978-1-4601-5501-1. Referenced guidelines are for fine textured soils under Agricultural land use.

[2] Alberta Environment and Parks (AEP). Environmental Quality Guidelines for Alberta Surface Waters. March 2018. Table 1 Surface water quality guidelines for the protection of freshwater aquatic life (PAL). Most conservative values applied (chronic or acute).

[3] Guideline varies with hardness.
[4] Guideline varies with pH and temperature.
[5] Guideline varies with chloride.
[6] Guideline varies with pH.
"-" No applicable guideline or not analyzed.
BOLD - Greater than Tier 1 Guideline.
Italic - Detection limit greater than Tier 1 guideline.
* - laboratory filtered.

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Table 4d: Field and Groundwater Analytical Results Summary - Lower Bedrock Wells

Parameter Group		Field			Routine																	Nutrients					Hydrocarbons										Organics		
Parameter		pH	Electrical Conductivity	Temperature	pH	Electrical Conductivity	Total Dissolved Solids	Hardness	Alkalinity, total (as CaCO3)	Bicarbonate	Carbonate	Hydroxide	Calcium	Magnesium	Potassium	Sodium	Chloride	Fluoride	Sulphate	Ionic Balance	Ammonia-N	Nitrate (N)	Nitrite (N)	Nitrate and Nitrite (N)	Total Kjeldahl Nitrogen	Benzene	Toluene	Ethylbenzene	Xylenes (m & p)	Xylene (o)	Xylenes	Styrene	F1 (C6-C10)	F1-BTEX	F2 (C10-C16)	Total Phenols	Chemical Oxygen Demand	Dissolved Organic Carbon
Unit		pH Units			pH Units	µS/cm	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	-	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		6.5-8.5	1000	-	6.5-8.5	1000	500	-	-	-	-	-	-	-	-	200	100	1	128-429	-	0.018-190	3	0.02-0.20	100	-	0.005	0.024	0.0016	-	-	0.02	0.072	2.2	2.2	1.1	-	-	-
Monitoring Well	Date																																						
15MW35-Deep	8-Jun-2016	8.22	**4900**	8.9	8.19	**4700**	**2400**	53	460	560	<0.50	<0.50	18	2.1	3.3	**970**	**1100**	-	25	1.0	**1.1**	0.25	<0.010	0.25	2.2	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	110	18
	7-Jun-2017	8.10	**3920**	10.0	8.13	**5300**	**2800**	58	410	500	<0.50	<0.50	20	2.1	3.8	**1100**	**1400**	-	13	2.3	**1.2**	<0.22	<0.16	<0.050	2.5	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	130	-
	26-Jun-2018	7.66	-	13.2	8.14	**5100**	**2800**	59	450	540	<1.0	<1.0	20	2.0	3.7	**1100**	**1400**	-	25	1.7	1.0	<0.02	<0.010	<0.020	2.2	<0.00040	<0.00040	<0.00040	-	-	<0.00089	<0.00050	-	<0.10	<0.10	0.0033	100	19
	17-Jun-2019	7.9	**5390**	10.4	8.29	**5300**	**3000**	60	430	530	<1.0	<1.0	21	2.0	3.6	**1300**	**1400**	-	27	9.5	**1.1**	<0.010	<0.010	<0.014	1.8	<0.00040	<0.00040	<0.00040	<0.00080	<0.00040	<0.00089	<0.00050	<0.10	<0.10	<0.10	0.015	110	19
	5-Jun-2020	7.64	**5270**	9.8	8.11	**5600**	**3000**	69	360	440	<1.0	<1.0	24	2.4	3.9	**1200**	**1500**	-	23	2.7	1.5	<0.010	<0.010	<0.014	2.0	<0.00040	<0.00040	<0.00040	<0.00080	<0.00040	<0.00089	<0.00050	<0.10	<0.10	<0.10	<0.0015	144	29
	3-Jun-2021	7.79	**5080**	15.7	8.46	**4760**	**3090**	69.4	430	505	9.5	<5.0	23.7	2.5	4.35	**1290**	**1480**	0.56	31.8	113	1.1	<0.10	<0.050	<0.11	1.6	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00071	<0.00050	<0.10	<0.10	<0.10	0.0014	88	19.4
	9-Jun-2022	7.90	**8960**	10	8.33	**5690**	**3060**	68.3	411	492	4.4	<1.0	23.2	2.5	3.67	**1090**	**1640**	0.683	22.1	89.1	1.5	<0.10	<0.050	<0.112	1.9	<0.00050	<0.00050	<0.00050	<0.00030	<0.00040	<0.00050	<0.00050	<0.10	<0.10	<0.10	0.0107	98	14.9
	16-Jun-2023	**8.51**	**2650**	20	**8.73**	**5,170**	**2,840**	63.3	430	474	25	<1.0	21.4	2.4	4.15	**1,050**	**1,420**	0.61	46.1	95	**1.02**	<0.200	<0.100	<0.224	1.71	<0.00050	<0.00050	<0.00050	<0.00040	<0.00030	<0.00050	<0.00050	<0.10	<0.100	0.28	0.0019	106	23.8
15MW36-Deep	8-Jun-2016	**8.52**	**3830**	7.7	**8.51**	**3600**	**2000**	52	550	650	13	<0.50	17	2.4	5.4	**800**	**770**	-	46	1.1	**0.92**	0.018	0.043	0.061	1.9	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	99	12
	7-Jun-2017	8.0	**4840**	10.3	8.33	**4800**	**2600**	53	770	940	3.1	<0.50	18	2.1	3.9	**1100**	**1100**	-	11	2.3	**1.3**	<0.044	<0.033	<0.010	2.6	<0.00040	<0.00040	<0.00040	-	-	<0.00080	-	-	<0.10	<0.10	-	140	-
	26-Jun-2018	7.38	**4900**	10.9	8.19	**4700**	**2600**	53	780	960	<1.0	<1.0	18	2.0	3.7	**1100**	**1000**	-	10	2.6	1.3	<0.02	<0.010	<0.020	2.8	<0.00040	<0.00040	<0.00040	-	-	<0.00089	<0.00050	-	<0.10	<0.10	0.010	130	35
	12-Jun-2019	8.05	**5280**	12.3	8.39	**4800**	**2500**	52	770	900	16.0	<1.0	18	1.9	3.7	**1100**	**980**	-	11	4.7	**1.3**	<0.010	<0.010	<0.014	2.1	<0.00040	<0.00040	<0.00040	<0.00080	<0.00040	<0.00089	<0.00050	<0.10	<0.10	<0.10	0.010	140	33
	5-Jun-2020	7.78	**4760**	11.4	8.32	**4800**	**2700**	57	750	910	3.8	<1.0	19	2.1	3.6	**1100**	**1100**	-	12	3.0	**1.3**	<0.010	<0.010	<0.014	1.9	<0.00040	<0.00040	<0.00040	<0.00080	<0.00040	<0.00080	<0.00050	<0.10	<0.10	<0.10	<0.0015	144	33
	3-Jun-2021	7.9	**4430**	12.6	**8.63**	**4110**	**2930**	64.6	799	918	28.2	<5.0	21.6	2.6	4.61	**1310**	**1100**	0.38	11.2	124.0	**1.05**	<0.10	<0.050	<0.11	1.9	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00071	<0.00050	<0.10	<0.10	<0.10	0.005	121	31.4
	10-Jun-2022	8.19	**5600**	10.8	**8.67**	**4690**	**2710**	51.7	939	1060	41.4	<1.0	17.3	2.07	3.43	**974**	**1090**	0.55	7.87	87.7	**1.18**	<0.10	<0.050	<0.112	2.6	<0.00050	<0.00050	<0.00050	<0.00030	<0.00040	<0.00050	<0.00050	<0.10	<0.10	<0.10	<0.0010	126	37.7
	16-Jun-2023	8.44	**2270**	20	**8.88**	**4,680**	**2,610**	49.1	760	820	52.8	<1.0	16.4	1.97	3.75	**1,000**	**1,070**	0.432	8.86	98	**1.41**	<0.200	<0.100	<0.224	2.44	<0.00050	<0.00050	<0.00050	<0.00040	<0.00030	<0.00050	<0.00050	<0.10	<0.100	<0.10	0.0213	126	36.6

Notes:

[1] Alberta Environment and Parks (AEP). 2022. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. ISBN 978-1-4601-5501-1. Referenced guidelines are for fine textured soils under Agricultural land use

[2] Alberta Environment and Parks (AEP). Environmental Quality Guidelines for Alberta Surface Waters. March 2018. Table 1 Surface water quality guidelines for the protection of freshwater aquatic life (PAL). Most conservative values applied (chronic or acute).

[3] Guideline varies with hardness.

[4] Guideline varies with pH and temperature.

[5] Guideline varies with chloride.

[6] Guideline varies with pH.

"-" No applicable guideline or not analyzed.

BOLD - Greater than Tier 1 Guideline.

Italic - Detection limit greater than Tier 1 guideline.

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Table 4d: Field and Groundwater Analytical Results Summary - Lower Bedrock Wells

Parameter Group		Dissolved Metals																																				
	Parameter	Aluminum	Antimony	Arsenic	Barium	Beryllium	Bismuth	Boron	Cadmium	Cesium	Chromium	Cobalt	Copper	Iron	Lead	Lithium	Manganese	Mercury	Molybdenum	Nickel	Phosphorus	Rubidium	Selenium	Silicon	Silver	Strontium	Sulphur	Tellurium	Thallium	Thorium	Tin	Titanium	Tungsten	Uranium	Vanadium	Zinc	Zirconium
	Unit	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		0.007-0.05	0.006	0.005	1	-	-	1.0	0.00004-0.00037	-	0.05	-	0.007	0.3	0.001-0.007	-	0.05	0.000005	-	0.007-0.17	-	-	0.002	-	0.0001	-	-	-	-	-	-	-	-	0.01	-	0.03	-
Monitoring Well	**Date**																																					
15MW35-Deep	8-Jun-2016	0.017	<0.00060	0.0018	0.27	-	-	0.69	0.000040	-	<0.0010	-	0.00094	<0.060	<0.00020	-	0.048	0.0000020	-	0.0038	-	-	0.00020	-	<0.00010	-	-	-	-	-	-	-	-	0.0023	-	<0.0030	-
	7-Jun-2017	0.0031	<0.00060	0.00081	0.41	-	-	0.75	<0.000020	-	<0.0010	-	0.00048	<0.060	<0.00020	-	**0.053**	<0.0000020	-	0.0013	-	-	<0.00020	-	<0.00010	-	-	-	-	-	-	-	-	0.00064	-	**0.16**	-
	26-Jun-2018	0.0034	<0.00060	0.00089	0.38	-	-	0.81	<0.000020	-	<0.0010	-	0.00079	<0.060	<0.00020	-	**0.061**	<0.0000020	-	0.0017	-	-	0.0003	-	<0.00010	-	-	-	-	-	-	-	-	0.00075	-	**0.48**	-
	17-Jun-2019	0.0044	<0.00060	0.00092	0.39	<0.0010	-	0.75	0.00004	-	<0.0010	0.00051	0.00034	<0.060	<0.00020	0.17	**0.082**	<0.0000020	0.018	0.0017	<0.10	-	<0.00020	3.7	<0.00010	0.5	8.2	-	<0.00020	-	<0.0010	<0.0010	-	0.00078	<0.0010	**0.03**	-
	5-Jun-2020	0.0054	<0.00060	0.00087	0.42	<0.001	-	0.78	<0.000020	-	<0.0010	0.0005	<0.00020	<0.060	<0.00020	0.19	**0.12**	<0.0000019	0.018	0.0018	<0.1	-	<0.00020	4	<0.00010	0.52	8.5	-	<0.0002	-	<0.001	0.0015	-	0.00081	<0.001	<0.0030	-
	3-Jun-2021	0.006	<0.00050	0.00082	0.469	<0.00050	<0.00025	0.823	<0.000025	<0.000050	<0.00050	0.00051	<0.0010	<0.050	<0.00025	0.216	**0.106**	<0.0000050	0.0216	<0.0025	<0.25	0.0065	<0.00025	4.67	<0.000050	0.57	15.8	<0.0010	<0.000050	<0.00050	0.0005	<0.0015	0.00052	0.00107	<0.0025	0.022	<0.0010
	9-Jun-2022	0.0073	<0.00050	0.00102	0.629	<0.00010	<0.00025	0.682	<0.000025	<0.000050	<0.0025	0.0009	<0.0010	<0.15	<0.00025	0.205	**0.665**	-	0.0191	0.00302	<0.25	0.00578	<0.00025	3.82	<0.000050	0.62	5.4	<0.0010	<0.000050	<0.00050	<0.00050	<0.0015	<0.00050	0.000637	<0.0025	<0.0050	<0.0015
	16-Jun-2023	<0.0100	<0.00100	0.00112	0.341	<0.000200	<0.000500	0.68	<0.000500	<0.000100	<0.00100	<0.00100	<0.00200	<0.100	<0.000500	0.179	**0.0544**	<0.0000050	0.0198	<0.00500	<0.500	0.00666	<0.000500	3.68	<0.000100	0.529	40.4	<0.00200	<0.000100	<0.00100	0.00601	<0.00300	<0.00100	0.00113	<0.00500	<0.0100	<0.00200
15MW36-Deep	8-Jun-2016	**0.19**	0.0030	**0.0088**	0.23	-	-	0.71	0.000070	-	<0.0010	-	**0.011**	**0.41**	0.00094	-	0.030	**0.00019**	-	0.0086	-	-	0.00096	-	<0.00010	-	-	-	-	-	-	-	-	0.0066	-	0.0068	-
	7-Jun-2017	0.0069	<0.00060	0.0024	0.32	-	-	0.97	<0.000020	-	<0.0010	-	0.0006	<0.060	<0.00020	-	**0.071**	<0.0000020	-	0.0046	-	-	0.00030	-	<0.00010	-	-	-	-	-	-	-	-	0.0016	-	**0.10**	-
	26-Jun-2018	0.0039	<0.00060	0.0025	0.32	-	-	1.00	<0.000020	-	<0.0010	-	0.00085	<0.060	<0.00020	-	**0.072**	<0.0000020	-	0.0050	-	-	0.00064	-	<0.00010	-	-	-	-	-	-	-	-	0.0016	-	**0.11**	-
	12-Jun-2019	0.0059	<0.00060	0.002	0.34	<0.0010	-	1.00	<0.000020	-	<0.0010	0.001	0.00029	<0.060	<0.00020	0.19	**0.13**	<0.0000020	0.013	0.0046	<0.10	-	<0.00020	3.5	<0.00010	0.42	3.7	-	<0.00020	-	0.0025	<0.0010	-	0.0015	<0.0010	**0.01**	-
	5-Jun-2020	0.0034	<0.00060	0.0019	0.37	<0.001	-	1.0	<0.000020	-	<0.0010	0.0014	<0.00020	0.23	<0.00020	0.19	**0.58**	<0.0000019	0.015	0.0052	<0.1	-	<0.00020	4.1	<0.00010	0.42	4.3	-	<0.0002	-	0.0014	0.0012	-	0.0016	<0.001	<0.0030	-
	3-Jun-2021	0.0096	<0.00050	0.0016	0.481	<0.00050	<0.00025	**1.15**	<0.000025	<0.000050	<0.00050	0.0008	0.0016	0.126	<0.00025	0.231	**0.466**	<0.0000050	0.0198	0.0036	<0.25	0.0067	0.00034	5.29	<0.000050	0.561	5.8	<0.0010	<0.000050	<0.00050	0.00115	<0.0015	<0.00050	0.00209	<0.0025	0.005	0.0018
	10-Jun-2022	0.0212	<0.00050	0.00198	0.461	<0.00010	<0.00025	0.806	<0.000025	<0.000050	<0.0025	0.00169	<0.0010	<0.15	<0.00025	0.201	**0.703**	-	0.0173	0.0074	<0.25	0.00537	<0.00025	4.18	<0.000050	0.457	4.79	<0.0010	<0.00005	<0.00050	0.00138	<0.0015	<0.00050	0.00138	<0.0025	0.0127	<0.0015
	16-Jun-2023	0.0065	<0.00050	0.00197	0.427	<0.000100	<0.000250	0.729	<0.0000250	<0.000050	<0.00050	0.00073	<0.00100	0.093	<0.000250	0.184	**0.478**	<0.0000050	0.0196	0.0035	<0.250	0.005	<0.000250	3.77	<0.000050	0.446	4.27	<0.00100	<0.000050	<0.00050	0.00335	<0.00150	<0.00050	0.00144	<0.00250	<0.0050	0.0017

Notes:

[1] Alberta Environment and Parks (AEP). 2022. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. ISBN 978-1-4601-5501-1. Referenced guidelines are for fine textured soils under Agricultural land use

[2] Alberta Environment and Parks (AEP). Environmental Quality Guidelines for Alberta Surface Waters. March 2018. Table 1 Surface water quality guidelines for the protection of freshwater aquatic life (PAL). Most conservative values applied (chronic or acute).

[3] Guideline varies with hardness.

[4] Guideline varies with pH and temperature.

[5] Guideline varies with chloride.

[6] Guideline varies with pH.

- No applicable guideline or not analyzed.

BOLD - Greater than Tier 1 Guideline.

Italic - Detection limit greater than Tier 1 guideline.

TETRA TECH

Table 4d: Field and Groundwater Analytical Results Summary - Lower Bedrock Wells

Monitoring Well	Date	Bromobenzene	Bromochloromethane	Bromodichloromethane	Bromoform	Bromomethane	n-Butylbenzene	sec-Butylbenzene	tert-Butylbenzene	Carbon tetrachloride	Chlorobenzene	Chloroethane	Chloroform	Chloromethane	2-Chlorotoluene	4-Chlorotoluene	Dibromochloromethane	1,2-Dibromo-3-chloropropane
Parameter Group		Volatile Organic Compounds (VOCs)																
Unit		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		-	-	-	-	-	-	-	-	0.002	0.0013	-	0.08	-	-	-	0.1	-
15MW35-Deep	8-Jun-2016			-	-	-				-	-	-	-	-			-	
	7-Jun-2017			-	-	-				-	-	-	-	-			-	
	26-Jun-2018			-	-	-				-	-	-	-	-			-	
	17-Jun-2019			<0.00050	<0.00050	<0.0020				<0.00050	<0.00050	<0.0010	<0.00050	<0.0020			<0.0010	
	5-Jun-2020			<0.00050	<0.00050	<0.0020				<0.00050	<0.00050	<0.0010	<0.00050	<0.0020			<0.0010	
	3-Jun-2021	<0.0010	<0.0010	<0.0010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.0010
	9-Jun-2022	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00020	<0.00050	<0.00050	<0.00050	<0.0020	<0.00050	<0.00050	<0.00050	<0.00050
	16-Jun-2023	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0010
15MW36-Deep	8-Jun-2016			-	-	-				-	-	-	-	-			-	
	7-Jun-2017			-	-	-				-	-	-	-	-			-	
	26-Jun-2018			-	-	-				-	-	-	-	-			-	
	12-Jun-2019			<0.00050	<0.00050	<0.0020				<0.00050	<0.00050	<0.0010	<0.00050	<0.0020			<0.0010	
	5-Jun-2020			<0.00050	<0.00050	<0.0020				<0.00050	<0.00050	<0.0010	<0.00050	<0.0020			<0.0010	
	3-Jun-2021	<0.0010	<0.0010	<0.0010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.0010
	10-Jun-2022	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00020	<0.00050	<0.00050	<0.00050	<0.0020	<0.00050	<0.00050	<0.00050	<0.00050
	16-Jun-2023	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0010

Monitoring Well	Date	1,2-Dibromoethane	Dibromomethane	1,2-Dichlorobenzene	1,3-Dichlorobenzene	1,4-Dichlorobenzene	1,1-Dichloroethane	1,2-Dichloroethane	1,1-Dichloroethene	1,2-Dichloroethene (cis)	1,2-Dichloroethene (trans)	Dichlorodifluoromethane	1,2-Dichloropropane	1,3-Dichloropropane	2,2-Dichloropropane	1,1-Dichloropropene	1,3-Dichloropropene [cis]	1,3-Dichloropropene [trans]	Hexachlorobutadiene	p-Isopropyltoluene	Methyl t-Butyl Ether (MTBE)
Unit		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		-	-	0.0007	-	0.001	-	0.005	0.014	-	-	-	-	-	-	-	-	-	-	-	0.015
15MW35-Deep	8-Jun-2016	-		-	-	-	-	-	-	-	-		-				-	-			-
	7-Jun-2017	-		-	-	-	-	-	-	-	-		-				-	-			-
	26-Jun-2018	-		-	-	-	-	-	-	-	-		-				-	-			-
	17-Jun-2019	<0.00020		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050		<0.00050				<0.00050	<0.00050			<0.00050
	5-Jun-2020	<0.00020		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050		<0.00050				<0.00050	<0.00050			<0.00050
	3-Jun-2021	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050
	9-Jun-2022	<0.00020	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	16-Jun-2023	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0015	<0.0010	<0.0010	<0.0010	<0.0010
15MW36-Deep	8-Jun-2016	-		-	-	-	-	-	-	-	-		-				-	-			-
	7-Jun-2017	-		-	-	-	-	-	-	-	-		-				-	-			-
	26-Jun-2018	-		-	-	-	-	-	-	-	-		-				-	-			-
	12-Jun-2019	<0.00020		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050		<0.00050				<0.00050	<0.00050			<0.00050
	5-Jun-2020	<0.00020		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050		<0.00050				<0.00050	<0.00050			<0.00050
	3-Jun-2021	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050
	10-Jun-2022	<0.00020	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	16-Jun-2023	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0015	<0.0010	<0.0010	<0.0010	<0.0010

Monitoring Well	Date	Methylene Chloride	Methyl Methacrylate	iso-Propylbenzene (cumene)	n-Propylbenzene	1,1,1,2-Tetrachloroethane	1,1,2,2-Tetrachloroethane	Tetrachloroethene	1,2,3-Trichlorobenzene	1,2,4-Trichlorobenzene	1,3,5-Trichlorobenzene	1,1,1-Trichloroethane	1,1,2-Trichloroethane	Trichloroethene	Trichlorofluoromethane	Trihalomethanes	1,2,3-Trichloropropane	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	Vinyl chloride
Unit		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		0.05	0.47	-	-	-	-	0.01	0.008	0.015	0.014	-	-	0.005	-	0.1	-	-	-	0.002
15MW35-Deep	8-Jun-2016	-	-			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	7-Jun-2017	-	-			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	26-Jun-2018	<0.0020	-			-	-	<0.00050	-	-	-	-	-	<0.00050	-	-		-	-	<0.00050
	17-Jun-2019	<0.0020	<0.00050			<0.0010	<0.0020	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0013		<0.00050	<0.00050	<0.00050
	5-Jun-2020	<0.0020	<0.00050			<0.0010	<0.0020	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0013		<0.00050	<0.00050	<0.00050
	3-Jun-2021	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0020	<0.0010	<0.0010	<0.0010
	9-Jun-2022	<0.0010	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	-	<0.00050	<0.00050	<0.00050	<0.00050	-	<0.00050	<0.00050	<0.00050	<0.00050
	16-Jun-2023	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010	<0.0010
15MW36-Deep	8-Jun-2016	-	-			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	7-Jun-2017	-	-			-	-	-	-	-	-	-	-	-	-	-		-	-	-
	26-Jun-2018	<0.0020	-			-	-	<0.00050	-	-	-	-	-	<0.00050	-	-		-	-	<0.00050
	12-Jun-2019	<0.0020	<0.00050			<0.0010	<0.0020	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0013		<0.00050	<0.00050	<0.00050
	5-Jun-2020	<0.0020	<0.00050			<0.0010	<0.0020	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0013		<0.00050	<0.00050	<0.00050
	3-Jun-2021	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0020	<0.0010	<0.0010	<0.0010
	10-Jun-2022	<0.0010	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	-	<0.00050	<0.00050	<0.00050	<0.00050	-	<0.00050	<0.00050	<0.00050	<0.00050
	16-Jun-2023	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010	<0.0010

Notes:

[1] Alberta Environment and Parks (AEP). 2022. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. ISBN 978-1-4601-5501-1. Referenced guidelines are for fine textured soils under Agricultural land use.
[2] Alberta Environment and Parks (AEP). Environmental Quality Guidelines for Alberta Surface Waters. March 2018. Table 1 Surface water quality guidelines for the protection of freshwater aquatic life (PAL). Most conservative values applied (chronic or acute).
[3] Guideline varies with hardness.
[4] Guideline varies with pH and temperature.
[5] Guideline varies with chloride.
[6] Guideline varies with pH.
"-" No applicable guideline or not analyzed.
BOLD - Greater than Tier 1 Guideline.
Italic - Detection limit greater than Tier 1 guideline.

TETRA TECH

Table 5a: Quality Assurance / Quality Control - Field Duplicates

		QAQC Type	DUPLICATES											
		Field ID	MW-1B	Dup-A	RPD (%)	MW-21B	Dup-B	RPD (%)	MW-36A	Dup-C	RPD (%)	MW-28A	Dup-D	RPD (%)
		Sample Date	15-Jun-2023	15-Jun-2023		15-Jun-2023	15-Jun-2023		16 Jun 2023	15 Jun 2023		16 Jun 2023	15 Jun 2023	
		Laboratory Report Number	EO2304968	EO2304968		EO2304968	EO2304968		EO2304968	EO2304968		EO2304968	EO2304968	
		Laboratory Sample ID	EO2304968-001	EO2304968-043		EO2304968-014	EO2304968-044		EO2304968-042	EO2304968-045		EO2304968-025	EO2304968-046	
Parameter	**Unit**	**RDL**												
Routine														
pH	pH Units	0.1	8.9	8.90	0.0	8.78	8.77	0.1	9.03	9.02	0.1	8.89	8.91	0.2
Electrical Conductivity (EC)	µS/cm	2	1,840	2,070	12.5	2,720	3,040	11.8	1,570	1,580	0.6	3,260	3,270	0.3
Total Dissolved Solids (TDS)	mg/L	1	1,350	1,380	2.2	2,140	2,140	0.0	1,010	1,000	1.0	2,230	2,300	3.1
Hardness as $CaCO_3$	mg/L	0.5	19.9	20.8	4.5	89.6	88.2	1.6	9.02	8.97	0.6	34.9	39.1	12.0
Alkalinity (total as $CaCO_3$)	mg/L	2	1,080	1,080	0.0	798	828	3.8	888	878	1.1	701	695	0.9
Bicarbonate	mg/L	1	1,170	1,180	0.9	886	927	4.6	944	936	0.8	756	746	1.3
Carbonate	mg/L	1	69.4	66.8	3.7	43.2	40.8	5.6	68.5	66.1	3.5	48.8	50.4	3.3
Hydroxide	mg/L	1	<1.0	<1.0	-	<1.0	<1.0	-	<1.0	<1.0	-	<1.0	<1.0	-
Calcium	mg/L	0.05	6.58	6.90	4.9	23	22.8	0.9	2.96	2.94	0.7	12	13.6	13.3
Magnesium	mg/L	0.005	0.845	0.872	3.2	7.81	7.60	2.7	0.396	0.395	0.3	1.2	1.24	3.3
Potassium	mg/L	0.05	2.01	1.98	1.5	4.84	4.96	2.5	1.48	1.46	1.4	2.74	2.73	0.4
Sodium	mg/L	0.05	532	550	3.4	768	754	1.8	438	434	0.9	761	828	8.8
Chloride	mg/L	0.5	5.53	5.62	1.6	<2.50	<2.50	-	6.68	6.62	0.9	3.76	3.73	0.8
Fluoride	mg/L	0.02	0.856	0.824	3.7	0.361	0.382	5.7	1.68	1.67	0.6	0.671	0.639	4.9
Sulphate	mg/L	0.3	95.5	98.0	2.6	839	832	0.8	<0.30	<0.30	-	1,010	1,010	0.0
Ionic Balance	N/A	0.01	95.5	98.0	2.6	106.0	102	3.8	107	108	0.9	96.6	106	9.7
Nutrients														
Ammonia as N	mg/L	0.005	0.368	0.300	18.5	0.0764	0.0515	**32.6**	0.701	0.660	5.8	1.33	1.24	6.8
Nitrate (as NO_3-N)	mg/L	0.02	0.261	0.338	**29.5**	<0.100	<0.100	-	0.022	<0.020	-	<0.100	<0.100	-
Nitrite (as NO_2-N)	mg/L	0.01	<0.050	<0.050	-	<0.050	<0.050	-	<0.010	0.014	-	<0.050	<0.050	-
Nitrate and Nitrite (as N)	mg/L	0.05	0.261	0.338	**29.5**	<0.112	<0.112	-	<0.0224	<0.0224	-	<0.112	<0.112	-
Total Kjeldahl Nitrogen (TKN)	mg/L	0.2	1.19	1.35	13.4	0.248	0.354	-	1.16	0.991	14.6	1.95	1.72	11.8
Carbon														
Dissolved Organic Carbon (DOC)	mg/L	0.5	7.6	8.23	8.3	6.71	6.60	1.6	17.1	15.5	9.4	9.92	10.8	8.9
Dissolved Metals														
Aluminum	mg/L	0.001	0.0096	0.0170	**77.1**	<0.0050	0.0056	-	0.0052	0.0053	1.9	0.0082	0.0078	4.9
Antimony	mg/L	0.0001	<0.00050	<0.00050	-	<0.00050	<0.00050	-	<0.00010	<0.00010	-	<0.00050	<0.00050	-
Arsenic	mg/L	0.0001	0.00144	0.00142	1.4	0.00081	0.00078	3.7	0.00114	0.00117	2.6	0.00068	0.00073	7.4
Barium	mg/L	0.0001	0.0505	0.0446	11.7	0.00899	0.00968	7.7	0.0747	0.0723	3.2	0.00909	0.00892	1.9
Beryllium	mg/L	0.00002	<0.000100	<0.000100	-	<0.000100	<0.000100	-	<0.000020	<0.000020	-	<0.000100	<0.000100	-
Bismuth	mg/L	0.00005	<0.000250	<0.000250	-	<0.000250	<0.000250	-	<0.000050	<0.000050	-	<0.000250	<0.000250	-
Boron	mg/L	0.01	0.678	0.703	3.7	0.344	0.196	**43.0**	0.661	0.640	3.2	0.728	0.821	12.8
Cadmium	mg/L	0.000005	0.000041	0.0000370	9.8	<0.0000250	<0.0000250	-	<0.0000050	0.0000053	-	<0.0000250	<0.0000250	-
Cesium	mg/L	0.00001	0.00005	0.000051	-	<0.000050	<0.000050	-	<0.000010	<0.000010	-	0.000059	0.000071	**20.3**
Chromium	mg/L	0.0005	<0.00050	<0.00050	-	<0.00050	<0.00050	-	<0.00050	<0.00050	-	<0.00050	<0.00050	-
Cobalt	mg/L	0.0001	<0.00050	<0.00050	-	<0.00050	<0.00050	-	0.00027	0.00027	-	<0.00050	<0.00050	-
Copper	mg/L	0.0002	0.0017	0.00146	14.1	<0.00100	<0.00100	-	0.0003	0.00031	-	<0.00100	<0.00100	-
Iron	mg/L	0.03	<0.050	<0.050	-	<0.050	<0.050	-	0.086	0.084	-	0.235	<0.050	-
Lead	mg/L	0.00005	<0.000250	<0.000250	-	<0.000250	<0.000250	-	0.000081	0.000079	-	<0.000250	<0.000250	-
Lithium	mg/L	0.001	0.126	0.124	1.6	0.307	0.313	2.0	0.0783	0.0769	1.8	0.159	0.164	3.1
Manganese	mg/L	0.005	0.0584	0.0561	3.9	0.00243	0.00234	-	0.179	0.176	1.7	0.0213	0.0220	-
Mercury	mg/L		<0.0000050	<0.0000050	-	<0.0000050	<0.0000050	-	<0.0000050	<0.0000050	-	<0.0000050	<0.0000050	-
Molybdenum	mg/L	0.00005	0.00782	0.00760	2.8	0.000992	0.00100	0.8	0.0122	0.0124	1.6	0.00176	0.00180	2.3
Nickel	mg/L	0.0005	0.00684	0.00714	4.4	<0.00250	<0.00250	-	0.00057	0.00053	-	<0.00250	<0.00250	-
Phosphorus	mg/L	0.05	<0.250	<0.250	-	<0.250	<0.250	-	0.313	0.319	1.9	<0.250	<0.250	-
Rubidium	mg/L	0.0002	0.00375	0.00364	2.9	0.0075	0.00734	1.7	0.00196	0.00215	9.7	0.0045	0.00511	13.1
Selenium	mg/L	0.00005	<0.000250	<0.000250	-	<0.000250	<0.000250	-	0.000068	<0.000050	-	<0.000250	<0.000250	-
Silicon	mg/L	0.05	3.2	3.32	3.7	4.18	4.25	1.7	4.13	4.07	1.5	3.97	4.78	**20.4**
Silver	mg/L	0.00001	<0.000050	<0.000050	-	<0.000050	<0.000050	-	<0.000010	<0.000010	-	<0.000050	<0.000050	-
Strontium	mg/L	0.0002	0.161	0.164	1.9	0.422	0.427	1.2	0.0647	0.0659	1.9	0.314	0.332	5.7
Sulphur	mg/L	0.5	51.8	50.8	1.9	314	288	8.3	<0.50	<0.50	-	338	414	**22.5**
Tellurium	mg/L	0.0002	<0.00100	<0.00100	-	<0.00100	<0.00100	-	<0.00020	<0.00020	-	<0.00100	<0.00100	-
Thallium	mg/L	0.00001	<0.000050	<0.000050	-	<0.000050	<0.000050	-	<0.000010	<0.000010	-	<0.000050	<0.000050	-
Thorium	mg/L	0.0001	<0.00050	<0.00050	-	<0.00050	<0.00050	-	<0.00010	0.00013	-	<0.00050	<0.00050	-
Tin	mg/L	0.0001	<0.00050	<0.00050	-	<0.00050	<0.00050	-	<0.00010	<0.00010	-	<0.00050	<0.00050	-
Titanium	mg/L	0.0003	<0.00150	<0.00150	-	<0.00150	<0.00150	-	<0.00030	<0.00030	-	<0.00150	<0.00150	-
Tungsten	mg/L	0.0001	<0.00050	<0.00050	-	<0.00050	<0.00050	-	0.00055	0.00054	1.8	<0.00050	<0.00050	-
Uranium	mg/L	0.00001	0.00128	0.00136	6.3	0.00216	0.00209	3.2	0.000184	0.000180	2.2	0.000321	0.000347	8.1
Vanadium	mg/L	0.0005	<0.00250	<0.00250	-	<0.00250	<0.00250	-	<0.00050	<0.00050	-	<0.00250	<0.00250	-
Zinc	mg/L	0.001	<0.0050	<0.0050	-	<0.0050	<0.0050	-	0.0014	0.0012	-	<0.0050	<0.0050	-
Zirconium	mg/L	0.0003	<0.00100	<0.00100	-	<0.00100	<0.00100	-	0.00074	0.00073	-	<0.00100	<0.00100	-
Hydrocarbons														
Benzene	mg/L	0.0005	<0.00050	<0.00050	-	<0.00050	<0.00050	-	<0.00050	<0.00050	-	<0.00050	<0.00050	-
Toluene	mg/L	0.0005	<0.00050	<0.00050	-	<0.00050	<0.00050	-	<0.00050	<0.00050	-	<0.00050	<0.00050	-
Ethylbenzene	mg/L	0.0005	<0.00050	<0.00050	-	<0.00050	<0.00050	-	<0.00050	<0.00050	-	<0.00050	<0.00050	-
Xylene (o)	mg/L	0.0003	<0.00030	<0.00030	-	<0.00030	<0.00030	-	<0.00030	<0.00030	-	<0.00030	<0.00030	-
Xylenes (m & p)	mg/L	0.0004	<0.00040	<0.00040	-	<0.00040	<0.00040	-	<0.00040	<0.00040	-	<0.00040	<0.00040	-
Xylenes Total	mg/L	0.0005	<0.00050	<0.00050	-	<0.00050	<0.00050	-	<0.00050	<0.00050	-	<0.00050	<0.00050	-
Styrene	mg/L	0.0005	<0.00050	<0.00050	-	<0.00050	<0.00050	-	<0.00050	<0.00050	-	<0.00050	<0.00050	-
F1 (C_6-C_{10})	mg/L	0.1	<0.10	<0.10	-	<0.10	<0.10	-	<0.10	<0.10	-	<0.10	<0.10	-
F1 (C_6-C_{10}) - BTEX	mg/L	0.1	<0.100	<0.100	-	<0.100	<0.100	-	<0.100	<0.100	-	<0.100	<0.100	-
F2 (C_{10}-C_{16})	mg/L	0.1	<0.10	<0.10	-	<0.10	<0.10	-	<0.10	<0.10	-	<0.10	<0.10	-
Phenols														
Phenols	mg/L	0.001	<0.0010	<0.0010	-	0.0024	<0.0010	-	<0.0010	<0.0010	-	<0.0010	<0.0010	-

Notes:
RDL - Reportable detection limit.
RPD - Relative percent difference calculated as (abs(C1-C2)/average(C1+C2))*100.
"-" Indicates RPD not calculated. RPDs have only been considered where a concentration is greater than 5 times the RDL.
N/A - Not applicable.
BOLD - RPD value greater than 20%.

Table 5a: Quality Assurance / Quality Control - Field Duplicates

		QAQC Type	DUPLICATES											
		Field ID	MW-1B	Dup-A	RPD (%)	MW-21B	Dup-B	RPD (%)	MW-36A	Dup-C	RPD (%)	MW-28A	Dup-D	RPD (%)
		Sample Date	15-Jun-2023	15-Jun-2023		15-Jun-2023	15-Jun-2023		16 Jun 2023	15 Jun 2023		16 Jun 2023	15 Jun 2023	
		Laboratory Report Number	EO2304968	EO2304968		EO2304968	EO2304968		EO2304968	EO2304968		EO2304968	EO2304968	
		Laboratory Sample ID	EO2304968-001	EO2304968-043		EO2304968-014	EO2304968-044		EO2304968-042	EO2304968-045		EO2304968-025	EO2304968-046	
Parameter	**Unit**	**RDL**												
Volatile Organic Compounds (VOCs)														
Bromobenzene	mg/L	0.001	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.0010	<0.0010	-
Bromochloromethane	mg/L	0.001	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.0010	<0.0010	-
Bromodichloromethane	mg/L	0.001	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.0010	<0.0010	-
Bromoform	mg/L	0.001	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.0010	<0.0010	-
Bromomethane	mg/L	0.001	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.0010	<0.0010	-
n-Butylbenzene	mg/L	0.001	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.0010	<0.0010	-
sec-Butylbenzene	mg/L	0.001	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.0010	<0.0010	-
tert-Butylbenzene	mg/L	0.001	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.0010	<0.0010	-
Carbon tetrachloride	mg/L	0.0005	<0.00050	<0.00050	-	<0.00050	<0.00050	-	<0.00050	<0.00050	-	<0.00050	<0.00050	-
Chlorobenzene	mg/L	0.001	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.0010	<0.0010	-
Chloroethane	mg/L	0.001	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.0010	<0.0010	-
Chloroform	mg/L	0.001	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.0010	<0.0010	-
Chloromethane	mg/L	0.005	<0.0050	<0.0050	-	<0.0050	<0.0050	-	<0.0050	<0.0050	-	<0.0050	<0.0050	-
2-Chlorotoluene	mg/L	0.001	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.0010	<0.0010	-
4-Chlorotoluene	mg/L	0.001	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.0010	<0.0010	-
Dibromochloromethane	mg/L	0.001	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.0010	<0.0010	-
1,2-Dibromo-3-chloropropane	mg/L	0.001	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.0010	<0.0010	-
1,2-Dibromoethane	mg/L	0.001	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.0010	<0.0010	-
Dibromomethane	mg/L	0.001	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.0010	<0.0010	-
1,2-Dichlorobenzene	mg/L	0.0005	<0.00050	<0.00050	-	<0.00050	<0.00050	-	<0.00050	<0.00050	-	<0.00050	<0.00050	-
1,3-Dichlorobenzene	mg/L	0.001	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.0010	<0.0010	-
1,4-Dichlorobenzene	mg/L	0.001	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.0010	<0.0010	-
1,1-Dichloroethane	mg/L	0.001	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.0010	<0.0010	-
1,2-Dichloroethane	mg/L	0.001	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.0010	<0.0010	-
1,1-Dichloroethene	mg/L	0.001	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.0010	<0.0010	-
1,2-Dichloroethene (cis)	mg/L	0.001	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.0010	<0.0010	-
1,2-Dichloroethene (trans)	mg/L	0.001	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.0010	<0.0010	-
Dichlorodifluoromethane	mg/L	0.001	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.0010	<0.0010	-
1,2-Dichloropropane	mg/L	0.001	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.0010	<0.0010	-
1,3-Dichloropropane	mg/L	0.001	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.0010	<0.0010	-
2,2-Dichloropropane	mg/L	0.001	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.0010	<0.0010	-
1,1-Dichloropropene	mg/L	0.001	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.0010	<0.0010	-
1,3-Dichloropropene	mg/L	0.0015	<0.0015	<0.0015	-	<0.0015	<0.0015	-	<0.0015	<0.0015	-	<0.0015	<0.0015	-
1,3-Dichloropropene [cis]	mg/L	0.001	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.0010	<0.0010	-
1,3-Dichloropropene [trans]	mg/L	0.001	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.0010	<0.0010	-
Hexachlorobutadiene	mg/L	0.001	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.0010	<0.0010	-
p-Isopropyltoluene	mg/L	0.001	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.0010	<0.0010	-
Methyl t-Butyl Ether (MTBE)	mg/L	0.0005	<0.00050	<0.00050	-	<0.00050	<0.00050	-	<0.00050	<0.00050	-	<0.00050	<0.00050	-
Methylene Chloride	mg/L	0.001	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.0010	<0.0010	-
iso-Propylbenzene (cumene)	mg/L	0.001	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.0010	<0.0010	-
n-Propylbenzene	mg/L	0.001	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.0010	<0.0010	-
1,1,1,2-Tetrachloroethane	mg/L	0.001	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.0010	<0.0010	-
1,1,2,2-Tetrachloroethane	mg/L	0.001	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.0010	<0.0010	-
Tetrachloroethene	mg/L	0.001	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.0010	<0.0010	-
1,2,3-Trichlorobenzene	mg/L	0.001	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.0010	<0.0010	-
1,2,4-Trichlorobenzene	mg/L	0.001	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.0010	<0.0010	-
1,1,1-Trichloroethane	mg/L	0.001	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.0010	<0.0010	-
1,1,2-Trichloroethane	mg/L	0.001	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.0010	<0.0010	-
Trichloroethene	mg/L	0.001	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.0010	<0.0010	-
Trichlorofluoromethane	mg/L	0.001	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.0010	<0.0010	-
Trihalomethanes	mg/L	0.002	<0.0020	<0.0020	-	<0.0020	<0.0020	-	<0.0020	<0.0020	-	<0.0020	<0.0020	-
1,2,3-Trichloropropane	mg/L	0.001	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.0010	<0.0010	-
1,2,4-Trimethylbenzene	mg/L	0.001	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.0010	<0.0010	-
1,3,5-Trimethylbenzene	mg/L	0.001	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.0010	<0.0010	-
Vinyl chloride	mg/L	0.001	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.0010	<0.0010	-

Notes:
RDL - Reportable detection limit.
RPD - Relative percent difference calculated as (abs(C1-C2)/average(C1+C2))*100.
"-" Indicates RPD not calculated. RPDs have only been considered where a concentration is greater than 5 times the RDL.
N/A - Not applicable.
BOLD - RPD value greater than 20%.

Table 5b: Quality Assurance / Quality Control - Blanks

		QAQC Type	BLANKS	
		Field ID	FIELD BLANK	TRIP BLANK
		Sample Date	15-Jun-2023	15-Jun-2023
		Laboratory Report Number	EO2304968	EO2304968
		Laboratory Sample ID	EO2304968-048	EO2304968-047
Parameter	**Unit**	**RDL**		
Routine				
pH	pH Units	0.1	**5.18**	**5.17**
Electrical Conductivity (EC)	µS/cm	2	<1.0	<1.0
Total Dissolved Solids (TDS)	mg/L	1	**4.6**	<1.0
Hardness as $CaCO_3$	mg/L	0.5	<0.50	<0.50
Alkalinity (total as $CaCO_3$)	mg/L	2	<1.0	<1.0
Bicarbonate	mg/L	1	<1.0	<1.0
Carbonate	mg/L	1	<1.0	<1.0
Hydroxide	mg/L	1	<1.0	<1.0
Calcium	mg/L	0.05	<0.050	<0.050
Magnesium	mg/L	0.005	<0.050	<0.050
Potassium	mg/L	0.05	<0.0050	<0.0050
Sodium	mg/L	0.05	<0.050	<0.050
Chloride	mg/L	0.5	**0.255**	<0.050
Fluoride	mg/L	0.02	<0.50	<0.50
Sulphate	mg/L	0.3	<0.30	<0.30
Ionic Balance	N/A	0.01	100	100
Nutrients				
Ammonia as N	mg/L	0.005	<0.0050	<0.0050
Nitrate (as NO_3-N)	mg/L	0.02	<0.020	<0.020
Nitrite (as NO_2-N)	mg/L	0.01	<0.010	<0.010
Nitrate and Nitrate (as N)	mg/L	0.05	<0.0224	<0.0224
Total Kjeldahl Nitrogen (TKN)	mg/L	0.2	<0.050	<0.050
Carbon				
Dissolved Organic Carbon (DOC)	mg/L	0.5	**4.21**	<0.50
Dissolved Metals				
Aluminum	mg/L	0.001	<0.0010	<0.0010
Antimony	mg/L	0.0001	<0.00010	<0.00010
Arsenic	mg/L	0.0001	<0.00010	<0.00010
Barium	mg/L	0.0001	<0.00010	<0.00010
Beryllium	mg/L	0.00002	<0.000020	<0.000020
Bismuth	mg/L	0.00005	<0.000050	<0.000050
Boron	mg/L	0.01	<0.010	<0.010
Cadmium	mg/L	0.000005	<0.0000050	<0.0000050
Cesium	mg/L	0.00001	<0.000010	<0.000010
Chromium	mg/L	0.0005	<0.00050	<0.00050
Cobalt	mg/L	0.0001	<0.00010	<0.00010
Copper	mg/L	0.0002	**0.00035**	<0.00020
Iron	mg/L	0.03	<0.010	<0.010
Lead	mg/L	0.00005	<0.000050	<0.000050
Lithium	mg/L	0.001	<0.0010	<0.0010
Manganese	mg/L	0.005	<0.00010	<0.00010
Mercury	mg/L		<0.0000050	<0.0000050
Molybdenum	mg/L	0.00005	<0.000050	<0.000050
Nickel	mg/L	0.0005	<0.00050	<0.00050
Phosphorus	mg/L	0.05	<0.050	<0.050
Rubidium	mg/L	0.0002	<0.00020	<0.00020
Selenium	mg/L	0.00005	<0.000050	<0.000050
Silicon	mg/L	0.05	**0.070**	<0.050
Silver	mg/L	0.00001	<0.000010	<0.000010
Strontium	mg/L	0.0002	<0.00020	<0.00020
Sulphur	mg/L	0.5	<0.50	<0.50
Tellurium	mg/L	0.0002	<0.00020	<0.00020
Thallium	mg/L	0.00001	<0.000010	<0.000010
Thorium	mg/L	0.0001	<0.00010	<0.00010
Tin	mg/L	0.0001	<0.00010	<0.00010
Titanium	mg/L	0.0003	<0.00030	<0.00030
Tungsten	mg/L	0.0001	<0.00010	<0.00010
Uranium	mg/L	0.00001	<0.000010	<0.000010
Vanadium	mg/L	0.0005	<0.00050	<0.00050
Zinc	mg/L	0.001	<0.0010	<0.0010
Zirconium	mg/L	0.0003	<0.00020	<0.00020
Hydrocarbons				
Benzene	mg/L	0.0005	<0.00050	<0.00050
Toluene	mg/L	0.0005	<0.00050	<0.00050
Ethylbenzene	mg/L	0.0005	<0.00050	<0.00050
Xylene (o)	mg/L	0.0003	<0.00030	<0.00030
Xylenes (m & p)	mg/L	0.0004	<0.00040	<0.00040
Xylenes Total	mg/L	0.0005	<0.00050	<0.00050
Styrene	mg/L	0.0005	<0.00050	<0.00050
F1 (C_6-C_{10})	mg/L	0.1	<0.10	<0.10
F1 (C_6-C_{10}) - BTEX	mg/L	0.1	<0.100	<0.100
F2 (C_{10}-C_{16})	mg/L	0.1	<0.10	<0.10
Phenols				
Phenols	mg/L	0.001	<0.0010	<0.0010

Notes:
RDL - Reportable detection limit.
N/A - Not applicable.
BOLD - Detect value.

Table 5b: Quality Assurance / Quality Control - Blanks

		QAQC Type	BLANKS	
		Field ID	FIELD BLANK	TRIP BLANK
		Sample Date	15-Jun-2023	15-Jun-2023
		Laboratory Report Number	EO2304968	EO2304968
		Laboratory Sample ID	EO2304968-048	EO2304968-047
Parameter	**Unit**	**RDL**		
Volatile Organic Compounds (VOCs)				
Bromobenzene	mg/L	0.001	<0.0010	<0.0010
Bromochloromethane	mg/L	0.001	<0.0010	<0.0010
Bromodichloromethane	mg/L	0.001	<0.0010	<0.0010
Bromoform	mg/L	0.001	<0.0010	<0.0010
Bromomethane	mg/L	0.001	<0.0010	<0.0010
n-Butylbenzene	mg/L	0.001	<0.0010	<0.0010
sec-Butylbenzene	mg/L	0.001	<0.0010	<0.0010
tert-Butylbenzene	mg/L	0.001	<0.0010	<0.0010
Carbon tetrachloride	mg/L	0.0005	<0.00050	<0.00050
Chlorobenzene	mg/L	0.001	<0.0010	<0.0010
Chloroethane	mg/L	0.001	<0.0010	<0.0010
Chloroform	mg/L	0.001	<0.0010	**0.0013**
Chloromethane	mg/L	0.005	<0.0050	<0.0050
2-Chlorotoluene	mg/L	0.001	<0.0010	<0.0010
4-Chlorotoluene	mg/L	0.001	<0.0010	<0.0010
Dibromochloromethane	mg/L	0.001	<0.0010	<0.0010
1,2-Dibromo-3-chloropropane	mg/L	0.001	<0.0010	<0.0010
1,2-Dibromoethane	mg/L	0.001	<0.0010	<0.0010
Dibromomethane	mg/L	0.001	<0.0010	<0.0010
1,2-Dichlorobenzene	mg/L	0.0005	<0.00050	<0.00050
1,3-Dichlorobenzene	mg/L	0.001	<0.0010	<0.0010
1,4-Dichlorobenzene	mg/L	0.001	<0.0010	<0.0010
1,1-Dichloroethane	mg/L	0.001	<0.0010	<0.0010
1,2-Dichloroethane	mg/L	0.001	<0.0010	<0.0010
1,1-Dichloroethene	mg/L	0.001	<0.0010	<0.0010
1,2-Dichloroethene (cis)	mg/L	0.001	<0.0010	<0.0010
1,2-Dichloroethene (trans)	mg/L	0.001	<0.0010	<0.0010
Dichlorodifluoromethane	mg/L	0.001	<0.0010	<0.0010
1,2-Dichloropropane	mg/L	0.001	<0.0010	<0.0010
1,3-Dichloropropane	mg/L	0.001	<0.0010	<0.0010
2,2-Dichloropropane	mg/L	0.001	<0.0010	<0.0010
1,1-Dichloropropene	mg/L	0.001	<0.0010	<0.0010
1,3-Dichloropropene	mg/L	0.0015	<0.0015	<0.0015
1,3-Dichloropropene [cis]	mg/L	0.001	<0.0010	<0.0010
1,3-Dichloropropene [trans]	mg/L	0.001	<0.0010	<0.0010
Hexachlorobutadiene	mg/L	0.001	<0.0010	<0.0010
p-Isopropyltoluene	mg/L	0.001	<0.0010	<0.0010
Methyl t-Butyl Ether (MTBE)	mg/L	0.0005	<0.00050	<0.00050
Methylene Chloride	mg/L	0.001	<0.0010	<0.0010
iso-Propylbenzene (cumene)	mg/L	0.001	<0.0010	<0.0010
n-Propylbenzene	mg/L	0.001	<0.0010	<0.0010
1,1,1,2-Tetrachloroethane	mg/L	0.001	<0.0010	<0.0010
1,1,2,2-Tetrachloroethane	mg/L	0.001	<0.0010	<0.0010
Tetrachloroethene	mg/L	0.001	<0.0010	<0.0010
1,2,3-Trichlorobenzene	mg/L	0.001	<0.0010	<0.0010
1,2,4-Trichlorobenzene	mg/L	0.001	<0.0010	<0.0010
1,1,1-Trichloroethane	mg/L	0.001	<0.0010	<0.0010
1,1,2-Trichloroethane	mg/L	0.001	<0.0010	<0.0010
Trichloroethene	mg/L	0.001	<0.0010	<0.0010
Trichlorofluoromethane	mg/L	0.001	<0.0010	<0.0010
Trihalomethanes	mg/L	0.002	<0.0020	<0.0020
1,2,3-Trichloropropane	mg/L	0.001	<0.0010	<0.0010
1,2,4-Trimethylbenzene	mg/L	0.001	<0.0010	<0.0010
1,3,5-Trimethylbenzene	mg/L	0.001	<0.0010	<0.0010
Vinyl chloride	mg/L	0.001	<0.0010	<0.0010

Notes:
RDL - Reportable detection limit.
N/A - Not applicable.
BOLD - Detect value.

FIGURES

Figure 1	Site Location Plan
Figure 2	Site Plan Showing Site Boundaries
Figure 3a	Monitoring Well Location Plan
Figure 3b	Surface Water Drainage Patterns
Figure 4a	Cross-Section Locations
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Figure 4c	Cross-Section B-B’
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Figure 5a	Surficial Materials West - Hydrograph
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Figure 5c	Upper Sandstone West - Hydrograph
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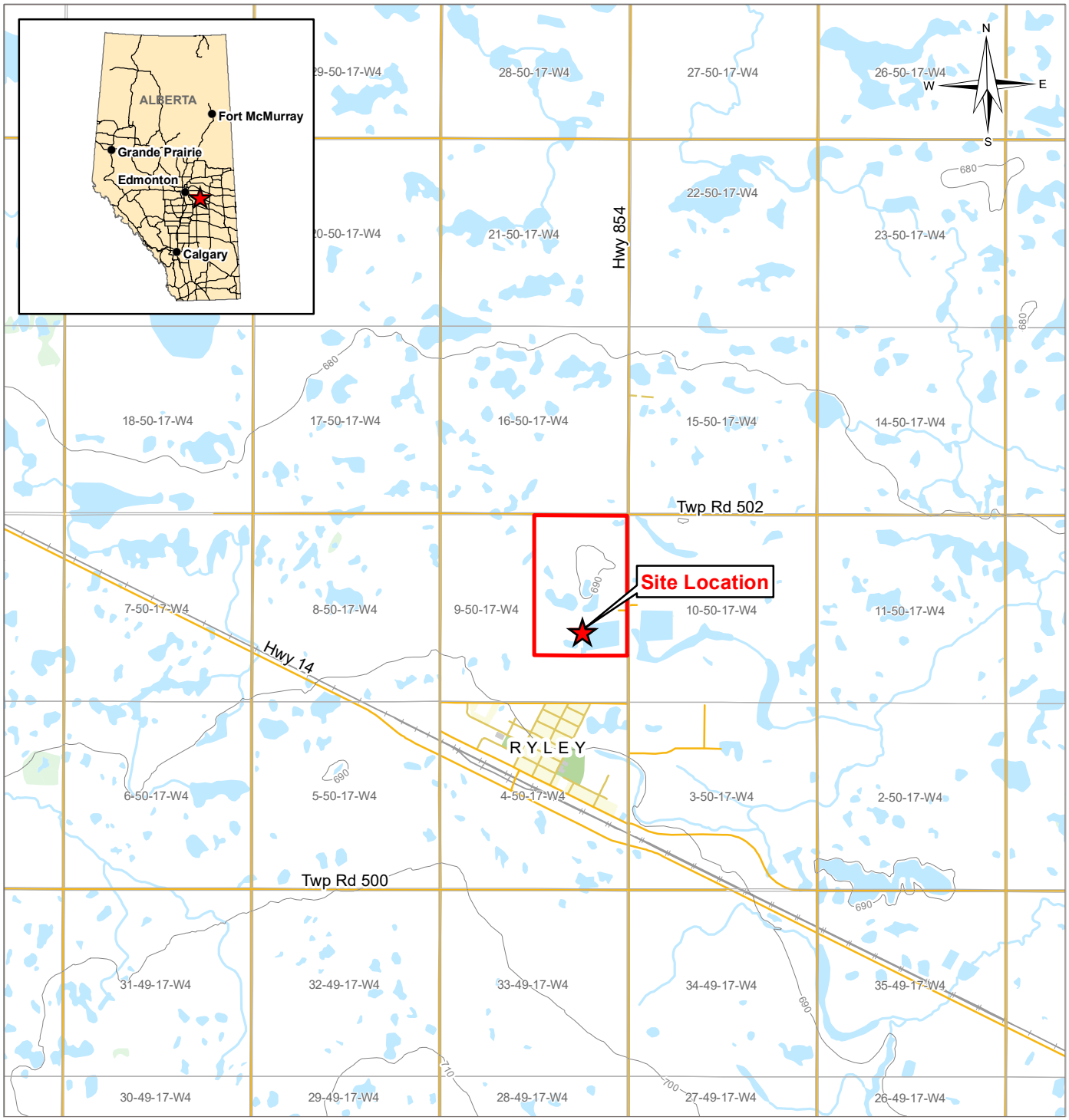
Figure 5e	Clay Shale West - Hydrograph
Figure 5f	Clay Shale East - Hydrograph
Figure 5g	Lower Bedrock - Hydrograph
Figure 6a	Groundwater Elevation Contours Surficial Materials – June 2023
Figure 6b	Groundwater Elevation Contours Upper Sandstone – June 2023
Figure 6c	Groundwater Elevation Contours Clay Shale – June 2023
Figure 6d	Groundwater Elevation Lower Bedrock – June 2023
Figure 7	Groundwater Exceedances Plan View



LEGEND

- Site Location
- Site Outline
- Main Road
- Local Road
- Resource/Recreational Road
- Railway
- Building
- Park
- Residential Area
- Contour (10 m)
- Watercourse
- Waterbody
- Wooded Area

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

STATUS
ISSUED FOR USE

2023 GROUNDWATER MONITORING PROGRAM RYLEY, ALBERTA

Site Location Plan

PROJECTION	DATUM	CLIENT
UTM Zone 12	NAD83	CleanHarbors

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

TETRA TECH

FILE NO.
SWOP04591-03_Figure01_SiteLocation.mxd

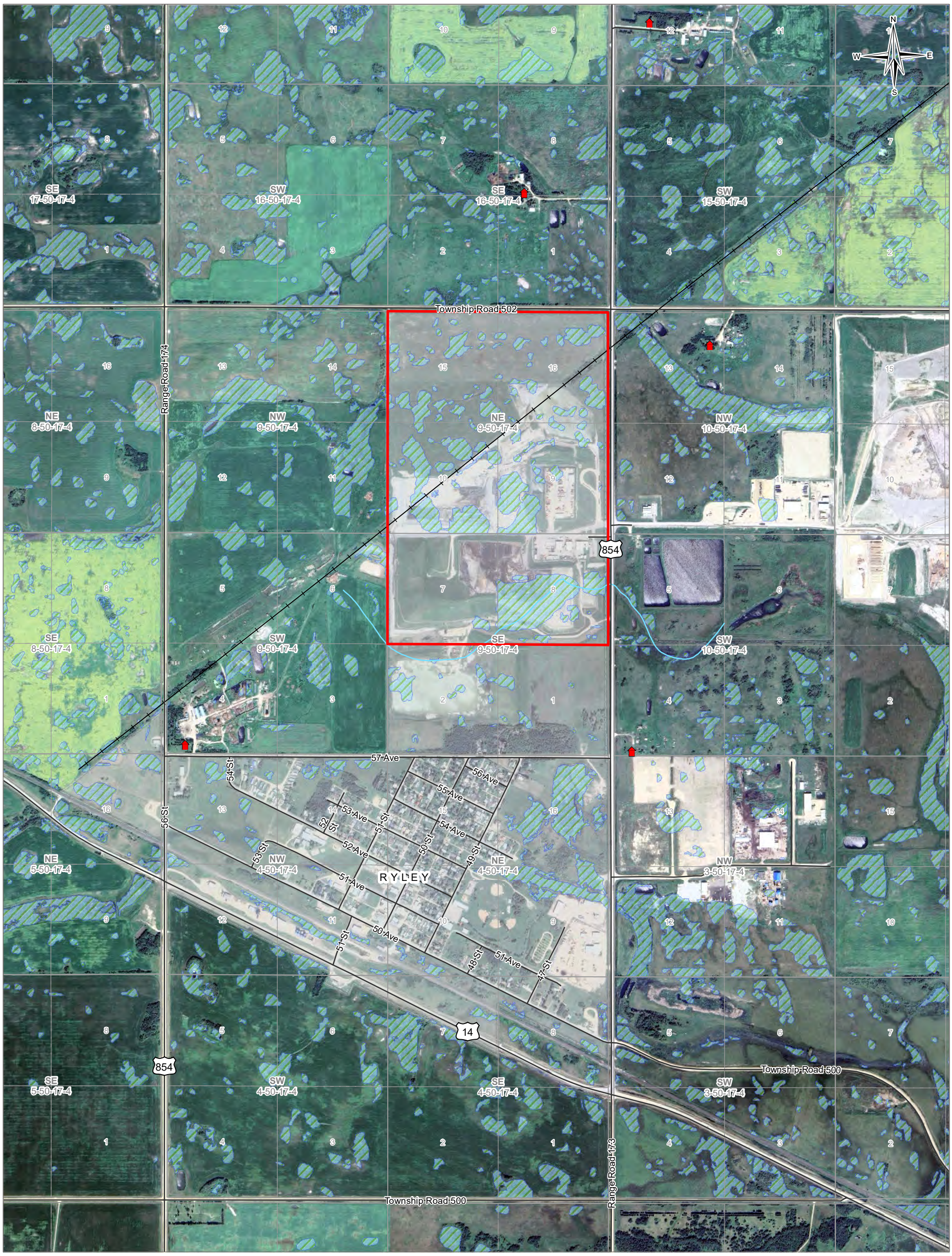
OFFICE	DWN	CKD	APVD	REV
Tt-EDM	MRB	SL	WW	0

DATE	PROJECT NO.
March 22, 2024	SWM.SWOP04591-03

Figure 1

G:\SOLID_WASTE\SWOP\SWOP04591-03\GIS\Maps\2023_Groundwater_Monitoring\SWOP04591-03_Figure01_SiteLocation.mxd modified 3/22/2024 by MEGAN.BURNS

G:\SOLID_WASTE\SWOP\SWOP04591-03\GIS\Maps\2023_Groundwater_Monitoring\SWOP04591-03_Figure02_SiteBoundary.mxd modified 3/22/2024 by MEGAN.BURNS



LEGEND

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

NOTES
Base data source: CanVec 1:50,000
Imagery provided by Google Earth; Airbus (2023)
Alberta Merged Wetland Inventory (2020)

STATUS
ISSUED FOR USE

2023 GROUNDWATER MONITORING PROGRAM RYLEY, ALBERTA

Site Plan Showing Site Boundaries

PROJECTION	DATUM	CLIENT
UTM Zone 12	NAD83	CleanHarbors

Scale: 1:13,500
200 100 0 200
Metres

TETRA TECH

FILE NO.
SWOP04591-03_Figure02_SiteBoundary.mxd

OFFICE	DWN	CKD	APVD	REV
Tt-EDM	MRB	SL	WW	0

DATE	PROJECT NO.
March 22, 2024	SWM.SWOP04591-03

Figure 2

LEGEND:

- MONITORING WELL LOCATION
- DECOMMISSIONED MONITORING WELL LOCATION
- SURFICIAL MATERIALS
- UPPER SANDSTONE
- CLAY SHALE
- LOWER BEDROCK
- TOPOGRAPHIC CONTOURS

NOTES
IMAGE FROM GOOGLE EARTH 2024.

EXISTING GROUND SURVEY RECIEVED JUNE 30, 2023

0 100 m

Scale: 1: 2 500

CLIENT

CleanHarbors

TETRA TECH

2023 GROUNDWATER MONITORING PROGRAM RYLEY, ALBERTA

Monitoring Well Location Plan

PROJECT NO.	DWN	CKD	REV
SWM.SWOP04591-03	MM/DBD	WW	0

OFFICE	DATE
Tt-EDM	January 16, 2024

Figure 3a

Q:\Edmonton\Drafting\00_MASTER PROJECT BASE PLANS\Clean Harbors Ryley\PROJECTS\SWM.SWOP04591-03_Groundwater Monitoring 2023\Acad\SWM.SWOP04591-03_Figure03a-03b_MWLocs.dwg [FIGURE 3A] March 20, 2024 - 2:22:21 pm (BY: FLEMING, ALEXA)

LEGEND:

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

NOTES
IMAGE FROM GOOGLE EARTH 2024.
EXISTING GROUND SURVEY RECIEVED JUNE 30, 2023

0 100 m
Scale: 1: 2 500

CLIENT
Clean Harbors

TETRA TECH

2023 GROUNDWATER MONITORING PROGRAM RYLEY, ALBERTA

Surface Water Drainage Patterns

PROJECT NO.	DWN	CKD	REV
SWM.SWOP04591-03	MM/DBD	WW	0

OFFICE	DATE
Tt-EDM	January 16, 2024

Figure 3b

Q:\Edmonton\Drafting\00_MASTER PROJECT BASE PLANS\Clean Harbors Ryley\PROJECTS\SWM.SWOP04591-03_Groundwater Monitoring 2023\Acad\SWM.SWOP04591-03_Figure03a-03b_MWLocs.dwg [FIGURE 3B] March 20, 2024 - 2:22:41 pm (BY: FLEMING, ALEXA)

LEGEND:

- MONITORING WELL LOCATION
- DECOMMISSIONED MONITORING WELL LOCATION
- SURFICIAL MATERIALS
- UPPER SANDSTONE
- CLAY SHALE
- LOWER BEDROCK
- A A' - CROSS-SECTION LOCATION
- TOPOGRAPHIC CONTOURS

NOTES
IMAGE FROM GOOGLE EARTH 2024.

EXISTING GROUND SURVEY RECIEVED JUNE 30, 2023

0 100 m
Scale: 1: 2 500

CLIENT
CleanHarbors

TETRA TECH

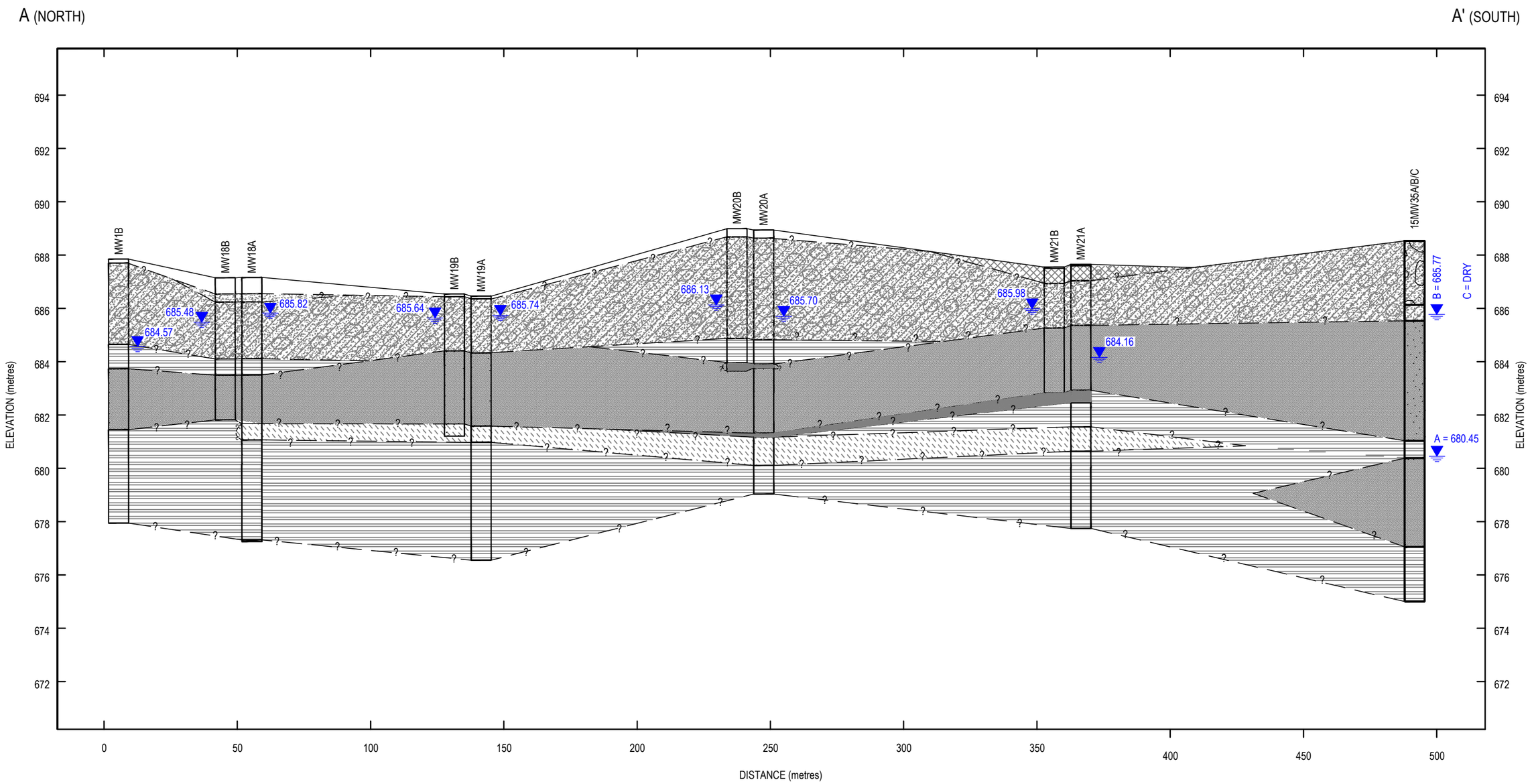
2023 GROUNDWATER MONITORING PROGRAM RYLEY, ALBERTA

Cross-Section Locations

PROJECT NO.	DWN	CKD	REV
SWM.SWOP04591-03	MM/DBD	WW	0
OFFICE	DATE		
Tt-EDM	January 16, 2024		

Figure 4a

Q:\Edmonton\Drafting\00_MASTER PROJECT BASE PLANS\Clean Harbors Ryley\PROJECTS\SWM.SWOP04591-03_Groundwater Monitoring 2023\Acad\SWM.SWOP04591-03_Figure04a_Figure07.dwg [FIGURE 4A] March 20, 2024 - 2:23:00 pm (BY: FLEMING, ALEXA)



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) (COLLECTED IN JUNE 2023)
- ? — ? — ? — - INFERRED

CLIENT

CleanHarbors

TETRA TECH

2023 GROUNDWATER MONITORING PROGRAM RYLEY, ALBERTA

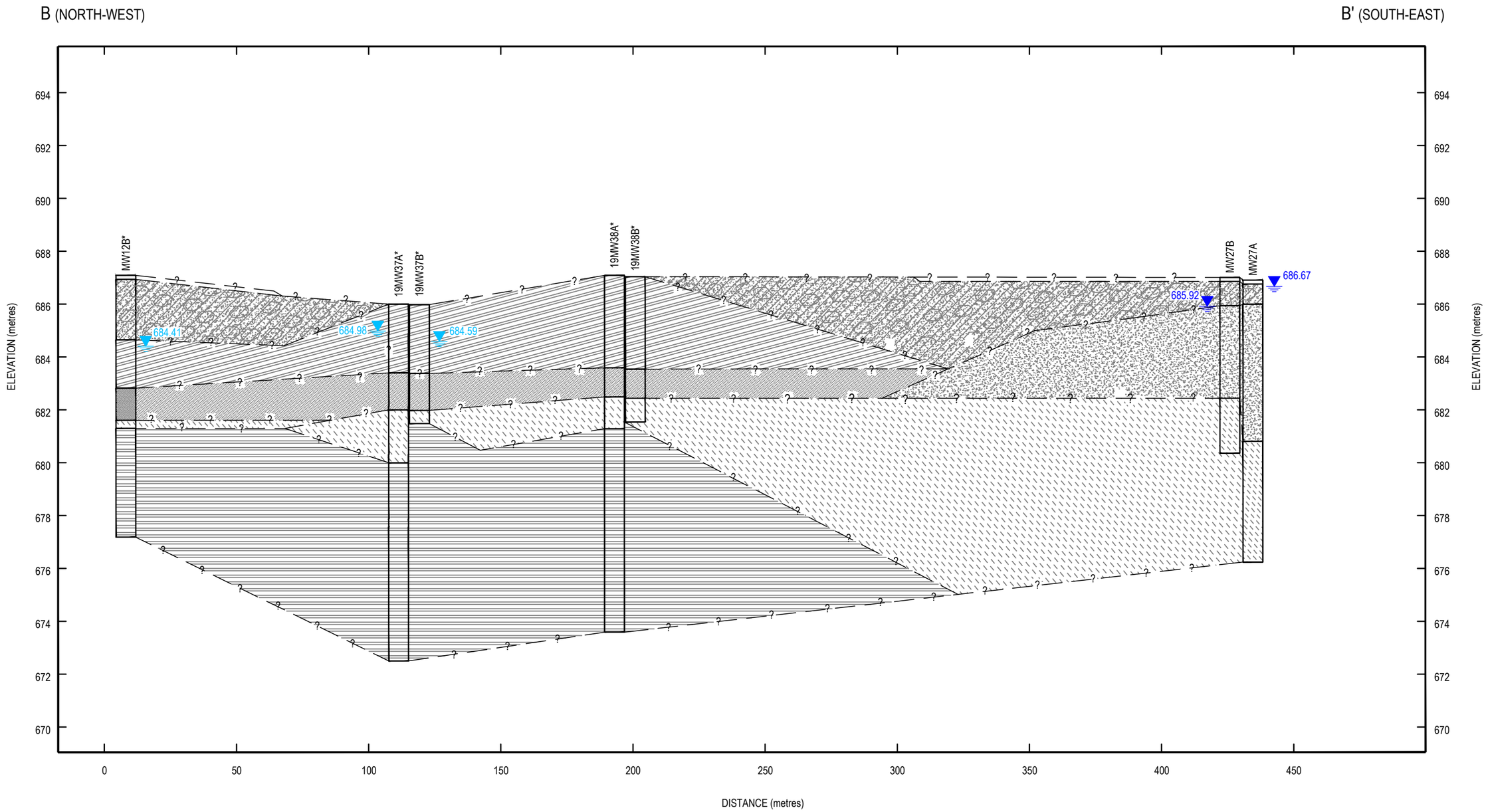
Cross-Section A-A'

PROJECT NO.	DWN	CKD	REV
SWM.SWOP04591-03	MM/DBD	WW	0

OFFICE	DATE
Tt-EDM	January 16, 2024

Figure 4b

Q:\Edmonton\Drafting\00_MASTER PROJECT BASE PLANS\Clean Harbors Ryley\PROJECTS\SWM.SWOP04591-03_Groundwater Monitoring 2023\Acad\SWM.SWOP04591-03_Figure04be_CrossSections.dwg [FIGURE 4B] January 16, 2024 - 2:40:47 pm [BY: BURNS, MEGAN]



SCALE AS SHOWN
10 X VERTICAL EXAGGERATION

LEGEND:

- TOPSOIL
- SAND
- SHALE
- SAND AND SHALE STONE
- CLAY
- GRAVEL
- SANDSTONE
- FILL
- SILT
- TILL
- SILTSTONE
- GROUNDWATER ELEVATIONS IN METRES ABOVE SEA LEVEL (MASL) (COLLECTED IN JUNE 2023)
- GROUNDWATER ELEVATIONS IN METRES ABOVE SEA LEVEL (MASL) (COLLECTED IN MAY 2023 BEFORE WELL WAS DECOMMISSIONED)
- INFERRED

NOTES
* WELL DECOMMISSIONED

19MW38A/B DECOMMISSIONED IN 2022 AND REPLACED BY 23MW38A/B IN DECEMBER 2023

CLIENT
Clean Harbors

TETRA TECH

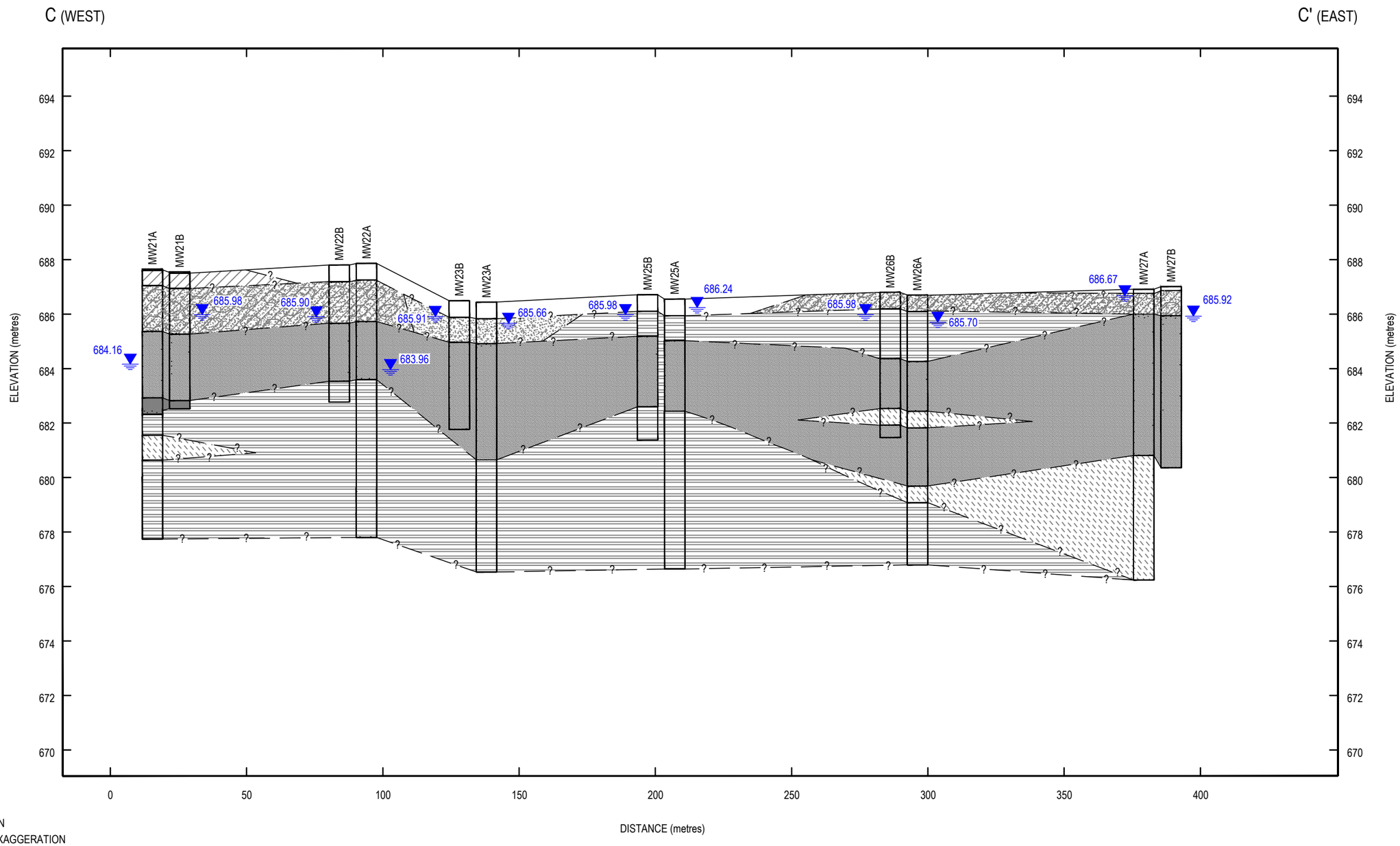
2023 GROUNDWATER MONITORING PROGRAM RYLEY, ALBERTA

Cross-Section B-B'

PROJECT NO.	DWN	CKD	REV
SWM.SWOP04591-03	MM/DBD	WW	0
OFFICE	DATE		
Tt-EDM	January 16, 2024		

Figure 4c

Q:\Edmonton\Drafting\00_MASTER PROJECT BASE PLANS\Clean Harbors Ryley\PROJECTS\SWM.SWOP04591-03_Groundwater Monitoring 2023\Acad\SWM.SWOP04591-03_Figure04bc_CrossSections.dwg [FIGURE 4C] January 16, 2024 - 3:14:21 pm (BY: BURNS, MEGAN)



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) (COLLECTED IN JUNE 2023)
- ? ? ? - INFERRED

CLIENT

CleanHarbors

TETRA TECH

2023 GROUNDWATER MONITORING PROGRAM RYLEY, ALBERTA

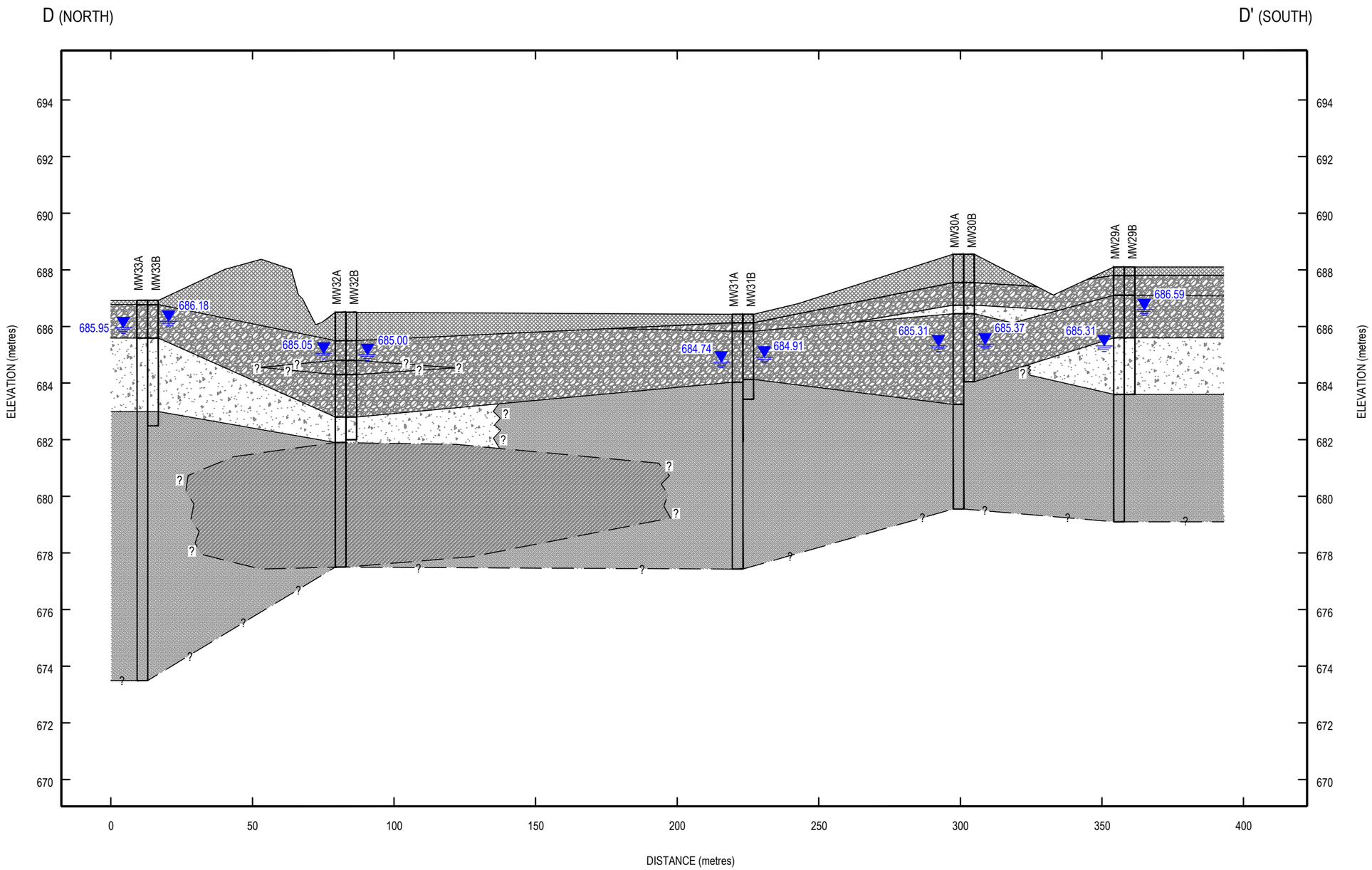
Cross-Section C-C'

PROJECT NO.	DWN	CKD	REV
SWM.SWOP04591-03	MM/DBD	WW	0

OFFICE	DATE
Tt-EDM	January 16, 2024

Figure 4d

Q:\Edmonton\Drafting\00_MASTER PROJECT BASE PLANS\Clean Harbors Ryley\PROJECTS\SWM.SWOP04591-03_Groundwater Monitoring 2023\Acad\SWM.SWOP04591-03_Figure04be_CrossSections.dwg [FIGURE 4D] January 16, 2024 - 3:42:49 pm (BY: BURNS, MEGAN)



SCALE AS SHOWN
10 X VERTICAL EXAGGERATION

LEGEND:

- FILL
- SAND
- CLAY
- SANDSTONE
- TILL
- XXX.XX - GROUNDWATER ELEVATIONS IN METRES ABOVE SEA LEVEL (MASL) (COLLECTED IN JUNE 2023)
- ? — ? — ? — - INFERRED

CLIENT

CleanHarbors

TETRA TECH

2023 GROUNDWATER MONITORING PROGRAM RYLEY, ALBERTA

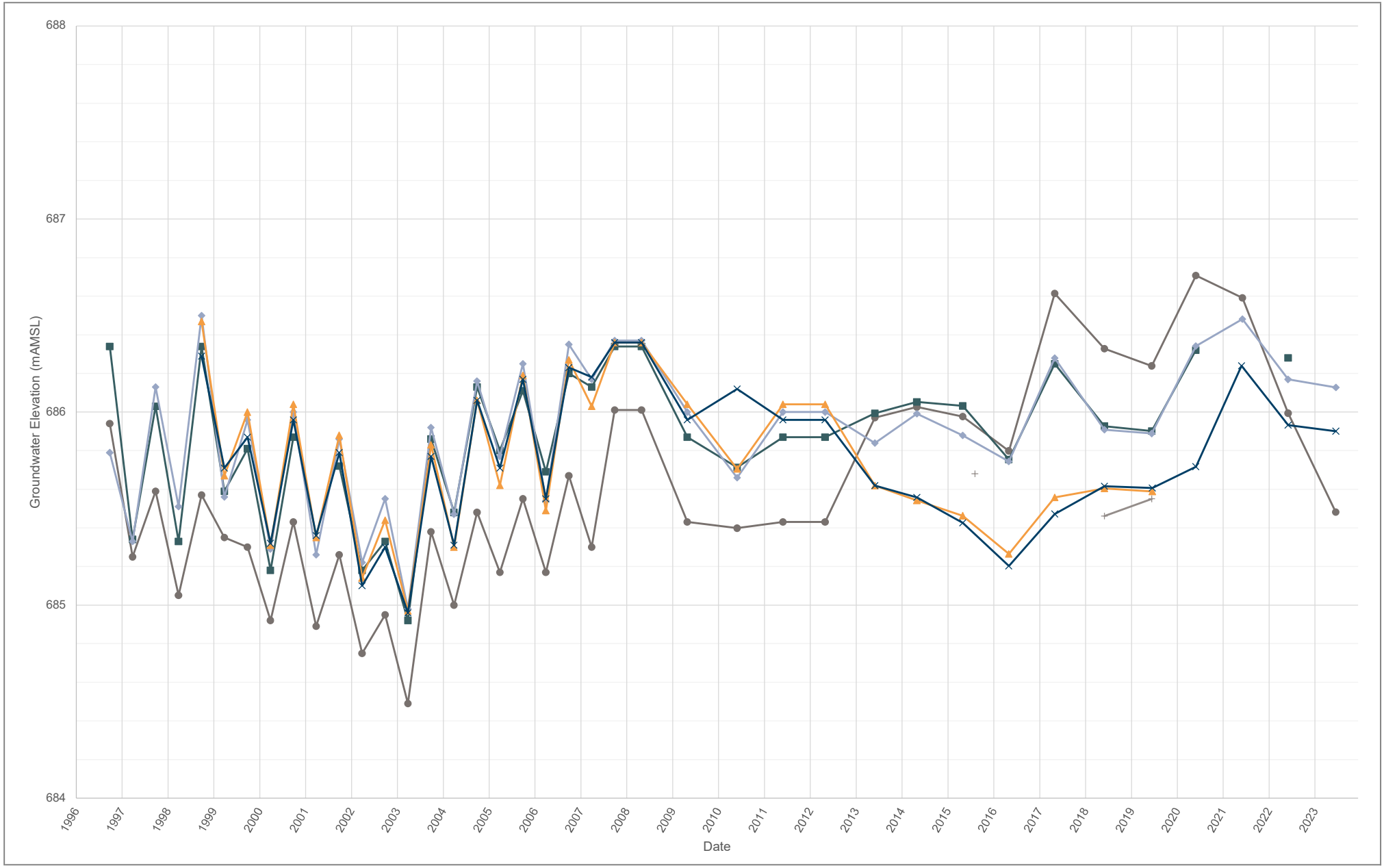
Cross-Section D-D'

PROJECT NO.	DWN	CKD	REV
SWM.SWOP04591-03	MM/DBD	WW	0

OFFICE	DATE
Tt-EDM	January 16, 2024

Figure 4e

Q:\Edmonton\Drafting\00_MASTER PROJECT BASE PLANS\Clean Harbors Ryley\PROJECTS\SWM.SWOP04591-03_Groundwater Monitoring 2023\Acad\SWM.SWOP04591-03_Figure04be_CrossSections.dwg [FIGURE 4E] January 17, 2024 - 9:47:50 am (BY: BURNS, MEGAN)



LEGEND

MW18B MW19B MW20B MW21B MW22B 15MW35C

CLIENT

CleanHarbors

2023 GROUNDWATER MONITORING PROGRAM
RYLEY, AB

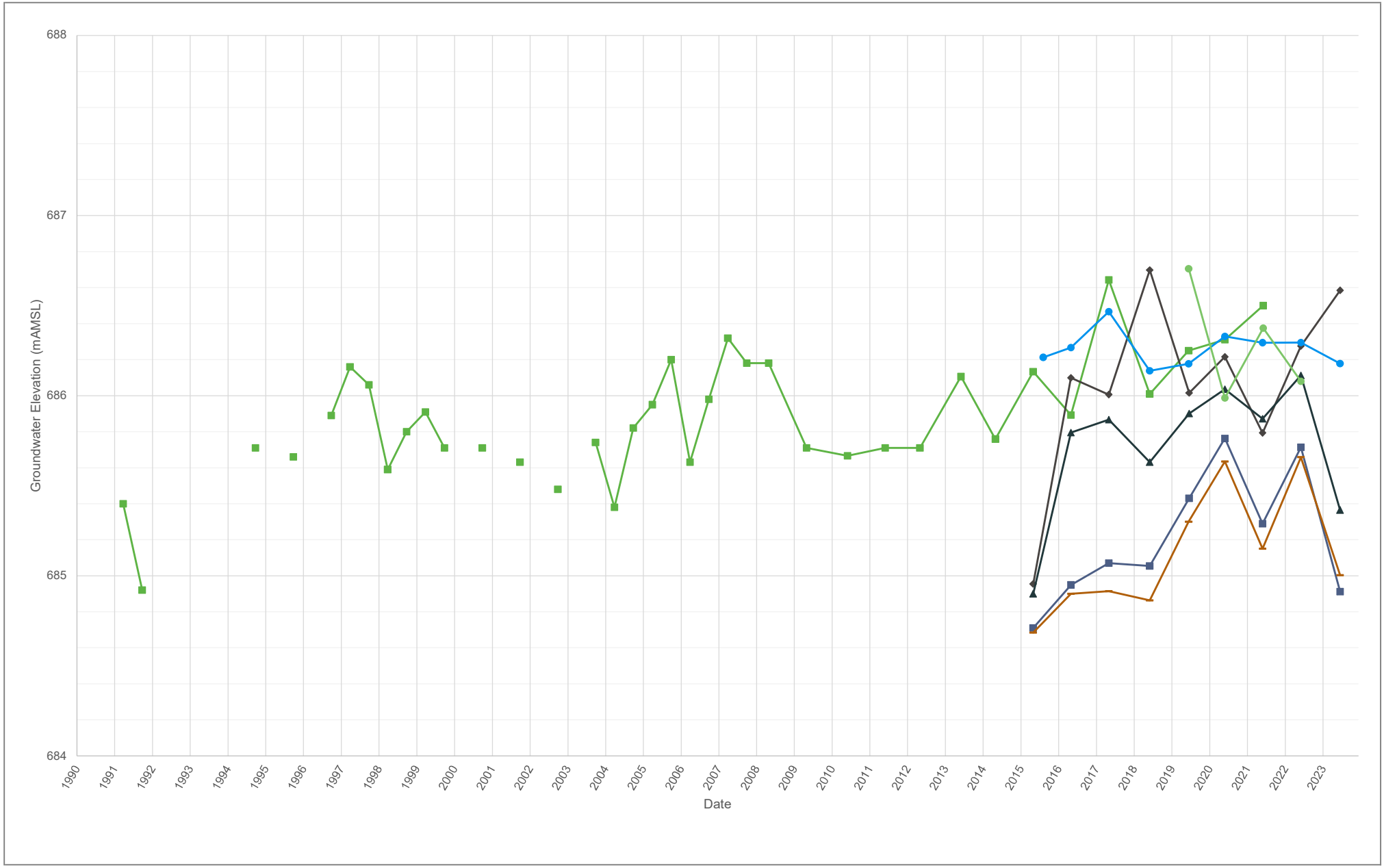
Surficial Materials West - Hydrograph

TETRA TECH

PROJECT NO.	DWN	CKD	APVD	REV
SWM.SWOP04591-03	MS	CF	AH	001
OFFICE	DATE		STATUS	
Tt - EBA - CAL	March, 2024		Issued for Use	

Figure 5a

https://tetratechinc.sharepoint.com/teams/704-SWM.SWOP04591-03/Shared%20Documents/Forms/AllItems.aspx?sw=auth&id=%2Fteams%2F704%2DSWM%2ESWOP04591%2D03%2FShared%20Documents%2F001%2FF



LEGEND

MW10 — MW29B — MW30B — MW31B — MW32B — MW33B — 19MW38B Decommissioned October 24, 2022

CLIENT

CleanHarbors

TETRA TECH

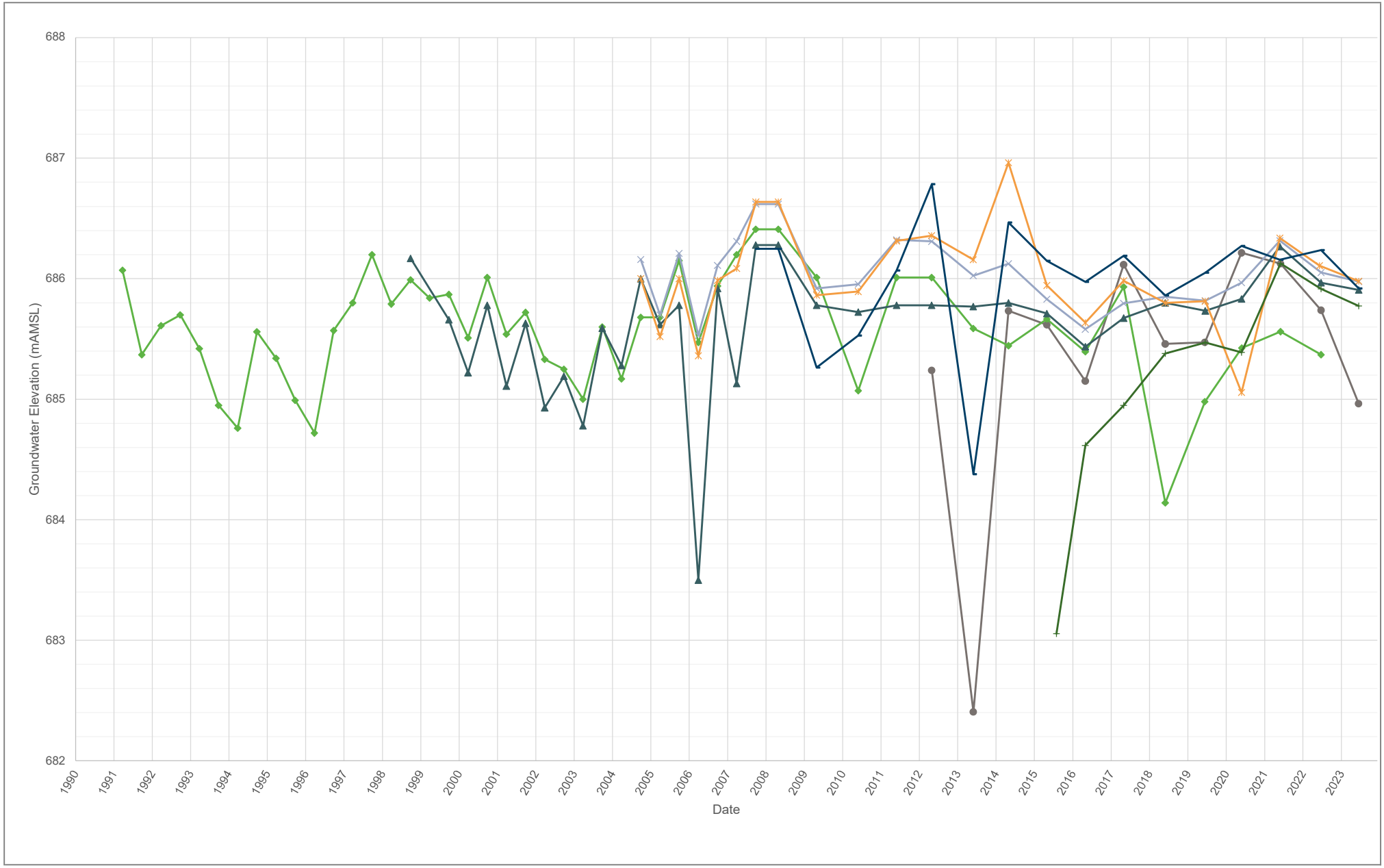
2023 GROUNDWATER MONITORING PROGRAM
RYLEY, AB

Surficial Materials East - Hydrograph

PROJECT NO.	DWN	CKD	APVD	REV
SWM.SWOP04591-03	MS	CF	AH	001
OFFICE	DATE		STATUS	
Tt - EBA - CAL	March, 2024		Issued for Use	

Figure 5b

https://tetratechinc.sharepoint.com/teams/704-SWM.SWOP04591-03/Shared%20Documents/Forms/AllItems.aspx?sw=auth&id=%2Fteams%2F704%2DSWM%2ESWOP04591%2D03%2FShared%20Documents%2F001%2FF



LEGEND

- MW1C
- MW12A Decommissioned April 27, 2023
- MW23B
- MW25B
- MW26B
- MW27B
- 15MW35B

CLIENT

CleanHarbors

TETRA TECH

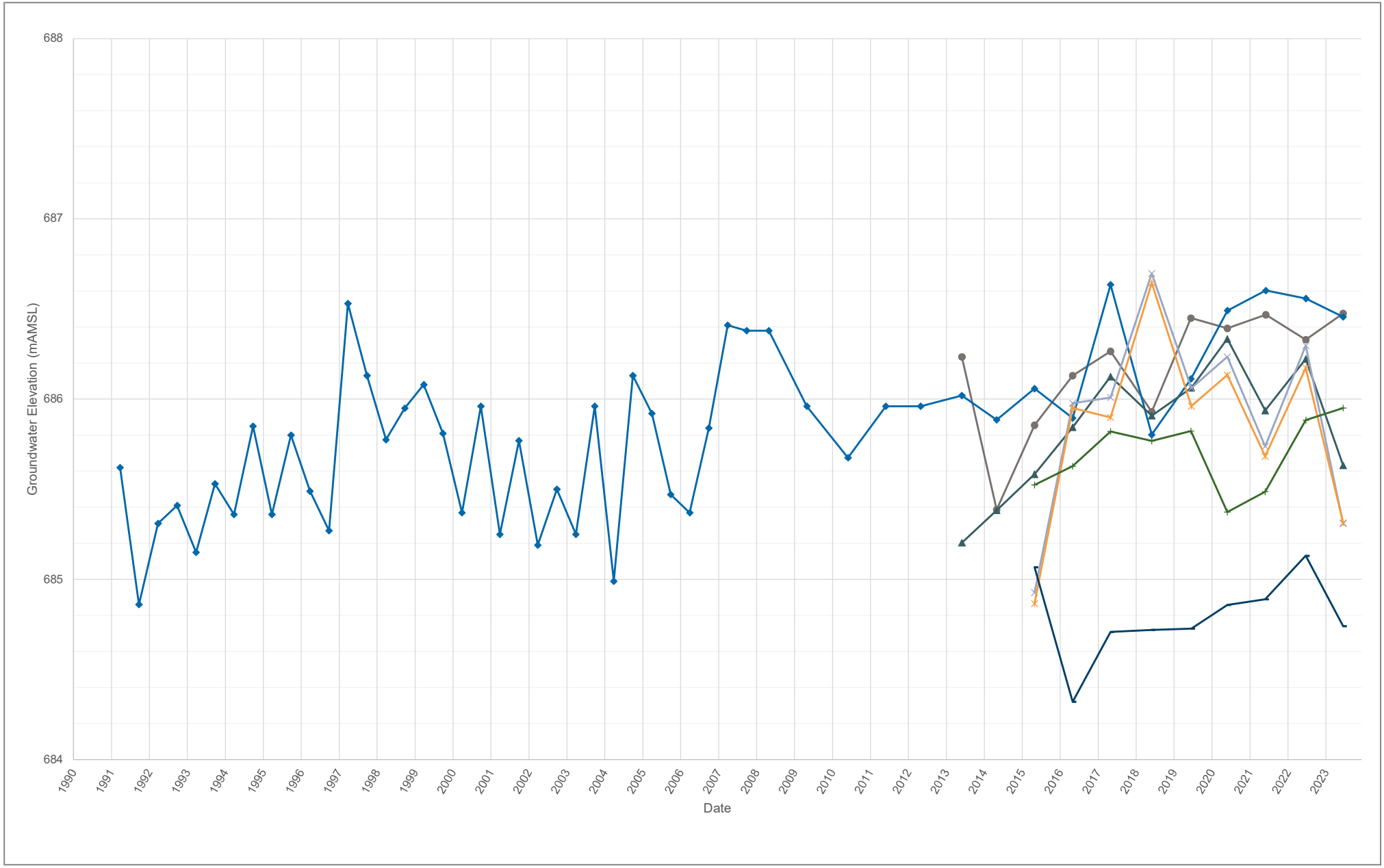
2023 GROUNDWATER MONITORING PROGRAM
RYLEY, AB

Upper Sandstone West - Hydrograph

PROJECT NO.	DWN	CKD	APVD	REV
SWM.SWOP04591-03	MS	CF	AH	001
OFFICE	DATE		STATUS	
Tt - EBA - CAL	March, 2024		Issued for Use	

Figure 5c

https://tetratechinc.sharepoint.com/teams/704-SWM.SWOP04591-03/Shared%20Documents/Forms/AllItems.aspx?sw=auth&id=%2Fteams%2F704%2DSWM%2ESWOP04591%2D03%2FShared%20Documents%2F001%2FF



LEGEND

MW8B — MW11 — MW28B — MW29A — MW30A — MW31A — MW33A

CLIENT

CleanHarbors

TETRA TECH

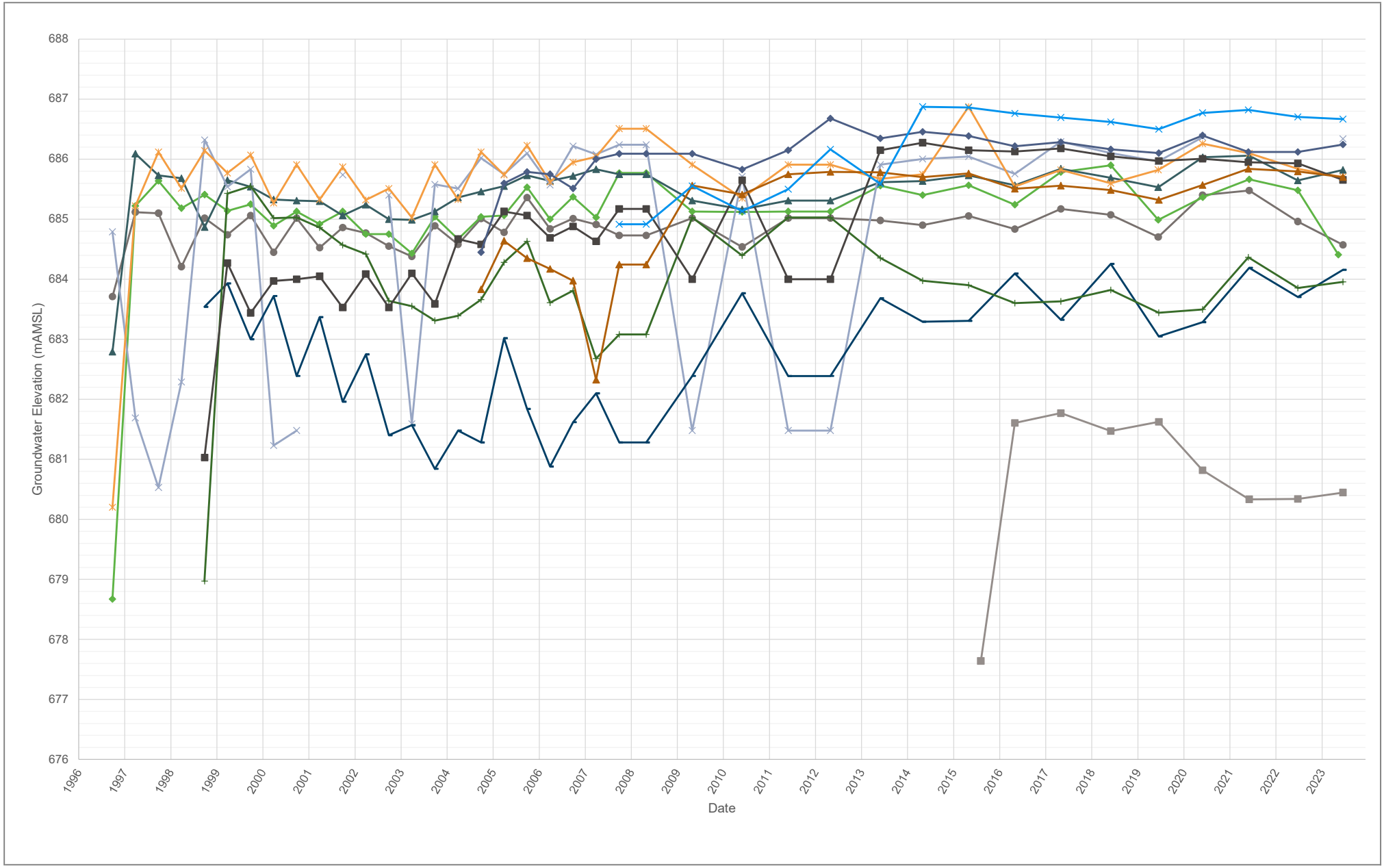
2023 GROUNDWATER MONITORING PROGRAM
RYLEY, AB

Upper Sandstone East - Hydrograph

PROJECT NO.	DWN	CKD	APVD	REV
SWM.SWOP04591-03	MS	CF	AH	001
OFFICE	DATE		STATUS	
Tt - EBA - CAL	March, 2024		Issued for Use	

Figure 5d

https://tetratechinc.sharepoint.com/teams/704-SWM.SWOP04591-03/Shared%20Documents/Forms/AllItems.aspx?sw=auth&id=%2Fteams%2F704%2DSWM%2ESWOP04591%2D03%2FShared%20Documents%2F001%2FF



LEGEND

- MW1B
- MW12B Decommissioned June 27, 2023
- MW18A
- MW19A
- MW20A
- MW21A
- MW22A
- MW23A
- MW25A
- MW26A
- MW27A
- 15MW35A

CLIENT

CleanHarbors

TETRA TECH

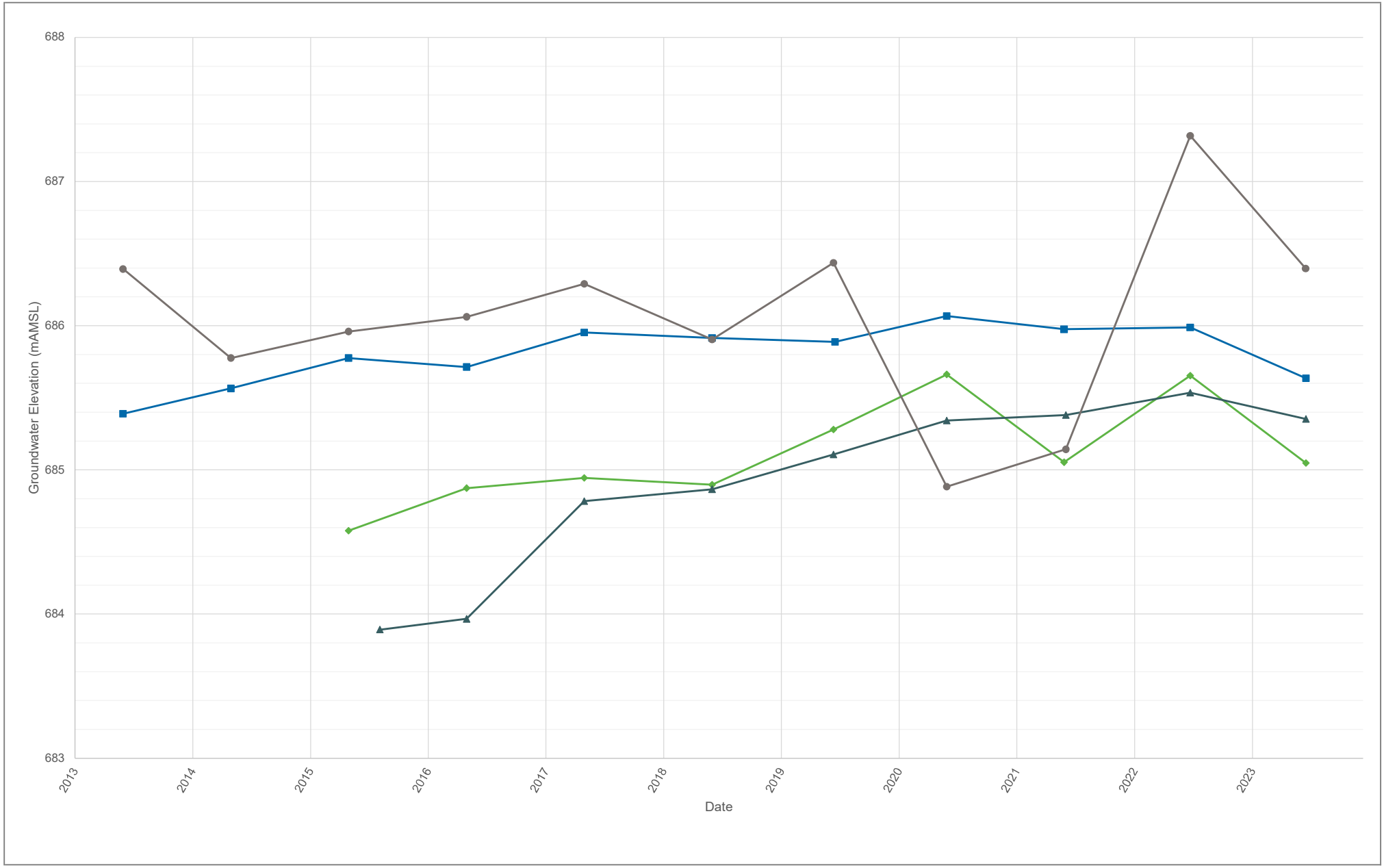
2023 GROUNDWATER MONITORING PROGRAM RYLEY, AB

Clay Shale West - Hydrograph

PROJECT NO.	DWN	CKD	APVD	REV
SWM.SWOP04591-03	MS	CF	AH	001
OFFICE	DATE		STATUS	
Tt - EBA - CAL	March, 2024		Issued for Use	

Figure 5e

https://tetratechinc.sharepoint.com/teams/704-SWM.SWOP04591-03/Shared%20Documents/Forms/AllItems.aspx?sw=auth&id=%2Fteams%2F704%2DSWM%2ESWOP04591%2D03%2FShared%20Documents%2F001%2FF



LEGEND

MW28A MW32A 15MW36A MW08A

CLIENT

CleanHarbors

TETRA TECH

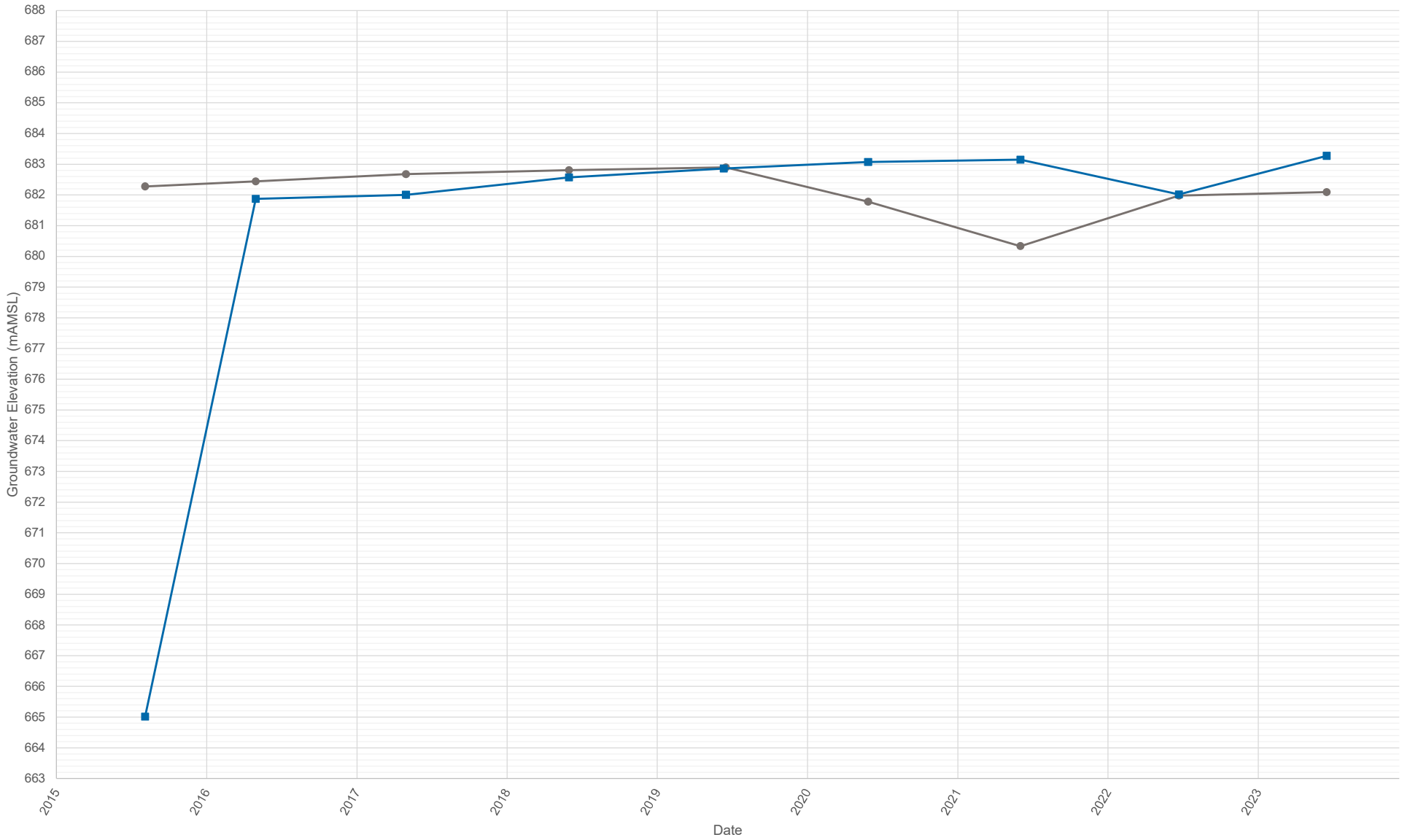
2023 GROUNDWATER MONITORING PROGRAM
RYLEY, AB

Clay Shale East - Hydrograph

PROJECT NO.	DWN	CKD	APVD	REV
SWM.SWOP04591-03	MS	CF	AH	001
OFFICE	DATE		STATUS	
Tt - EBA - CAL	March, 2024		Issued for Use	

Figure 5f

https://tetratechinc.sharepoint.com/teams/704-SWM.SWOP04591-03/Shared%20Documents/Forms/AllItems.aspx?sw=auth&id=%2Fteams%2F704%2DSWM%2ESWOP04591%2D03%2FShared%20Documents%2F001%2FF



LEGEND

15MW35-Deep

15MW36-Deep

CLIENT

CleanHarbors

TETRA TECH

2023 GROUNDWATER MONITORING PROGRAM
RYLEY, AB

Lower Bedrock - Hydrograph

PROJECT NO.	DWN	CKD	APVD	REV
SWM.SWOP04591-03	MS	CF	AH	001
OFFICE	DATE		STATUS	
Tt - EBA - CAL	March, 2024		Issued for Use	

Figure 5g

https://tetratechinc.sharepoint.com/teams/704-SWM.SWOP04591-03/Shared%20Documents/Forms/AllItems.aspx?sw=auth&id=%2Fteams%2F704%2DSWM%2ESWOP04591%2D03%2FShared%20Documents%2F001%2FF

G:\SOLID_WASTE\SWOP\SWOP04591-03\GIS\Maps\2023_Groundwater_Monitoring\SWOP04591-03_Figure06a_Surficial.mxd modified 3/22/2024 by MEGAN.BURNS

LEGEND

Monitoring Well

Decommissioned Monitoring Well

68X.XX Groundwater Elevation (masl)

Interpreted Groundwater Elevation Contour (0.2 m)

Inferred Groundwater Flow Direction

NOTES
Base data source: Imagery provided by Google Earth; Airbus (2023)

STATUS
ISSUED FOR USE

Scale: 1:4,000

80 40 0 80

Metres

PROJECTION	DATUM
UTM Zone 12	NAD83

FILE NO.
SWOP04591-03_Figure06a_Surficial.mxd

CLIENT
CleanHarbors

TETRA TECH

2023 GROUNDWATER MONITORING PROGRAM RYLEY, ALBERTA

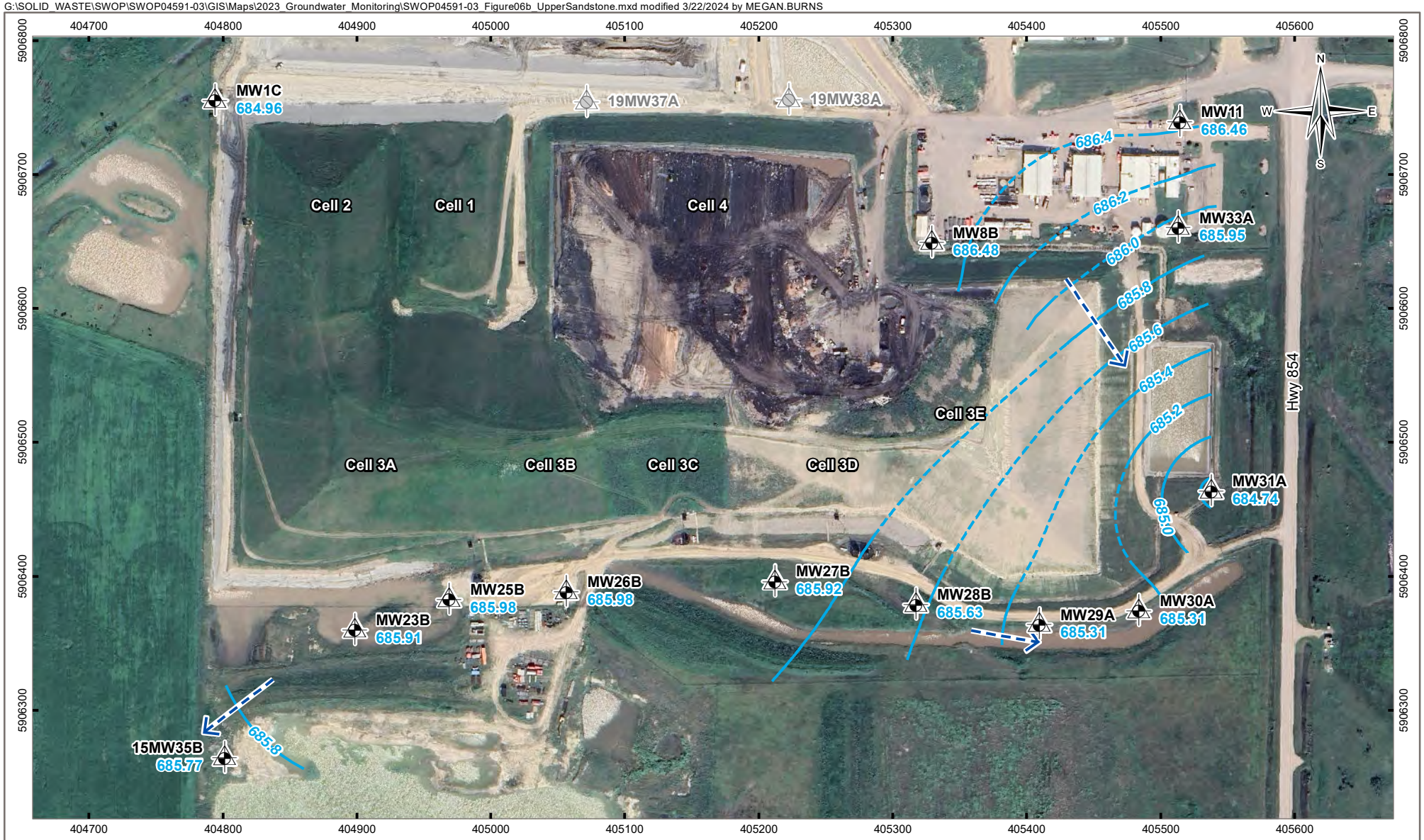
Groundwater Elevation Contours Surficial Materials - June 2023

OFFICE	DWN	CKD	APVD	REV
Tt-EDM	MRB	SL	WW	0

DATE	PROJECT NO.
March 22, 2024	SWM.SWOP04591-03

Figure 6a

G:\SOLID_WASTE\SWOP\SWOP04591-03\GIS\Maps\2023_Groundwater_Monitoring\SWOP04591-03_Figure06b_UpperSandstone.mxd modified 3/22/2024 by MEGAN.BURNS



LEGEND

Monitoring Well

Decommissioned Monitoring Well

68X.XX Groundwater Elevation (masl)

Interpreted Groundwater Elevation Contour (0.2 m)

Inferred Groundwater Flow Direction

NOTES
Base data source: Imagery provided by Google Earth; Airbus (2023)

STATUS
ISSUED FOR USE

Scale: 1:4,000

80 40 0 80
Metres

PROJECTION	DATUM
UTM Zone 12	NAD83

FILE NO.
SWOP04591-03_Figure06b_UpperSandstone.mxd

CLIENT
CleanHarbors

TETRA TECH

2023 GROUNDWATER MONITORING PROGRAM RYLEY, ALBERTA

Groundwater Elevation Contours Upper Sandstone - June 2023

OFFICE	DWN	CKD	APVD	REV
Tt-EDM	MRB	SL	WW	0

DATE	PROJECT NO.
March 22, 2024	SWM.SWOP04591-03

Figure 6b

G:\SOLID_WASTE\SWOP\SWOP04591-03\GIS\Maps\2023_Groundwater_Monitoring\SWOP04591-03_Figure06c_ClayShale.mxd modified 3/22/2024 by MEGAN.BURNS

LEGEND

Monitoring Well

Decommissioned Monitoring Well

68X.XX Groundwater Elevation (masl)

Interpreted Groundwater Elevation Contour (0.5 m)

Inferred Groundwater Flow Direction

NOTES
Base data source: Imagery provided by Google Earth; Airbus (2023)

STATUS
ISSUED FOR USE

Scale: 1:4,000

80 40 0 80
Metres

PROJECTION	DATUM
UTM Zone 12	NAD83

FILE NO.
SWOP04591-03_Figure06c_ClayShale.mxd

CLIENT
Clean Harbors

TETRA TECH

2023 GROUNDWATER MONITORING PROGRAM RYLEY, ALBERTA

Groundwater Elevation Contours Clay Shale - June 2023

OFFICE	DWN	CKD	APVD	REV
Tt-EDM	MRB	SL	WW	0

DATE	PROJECT NO.
March 22, 2024	SWM.SWOP04591-03

Figure 6c

LEGEND

Monitoring Well

68X.XX Groundwater Elevation (masl)

NOTES
Base data source: Imagery provided by Google Earth; Airbus (2023)

* Groundwater elevation recorded on May 4, 2023

STATUS
ISSUED FOR USE

2023 GROUNDWATER MONITORING PROGRAM RYLEY, ALBERTA

Groundwater Elevation Lower Bedrock - June 2023

PROJECTION	DATUM	CLIENT
UTM Zone 12	NAD83	CleanHarbors

Scale: 1:8,000
150 75 0 150
Metres

TETRA TECH

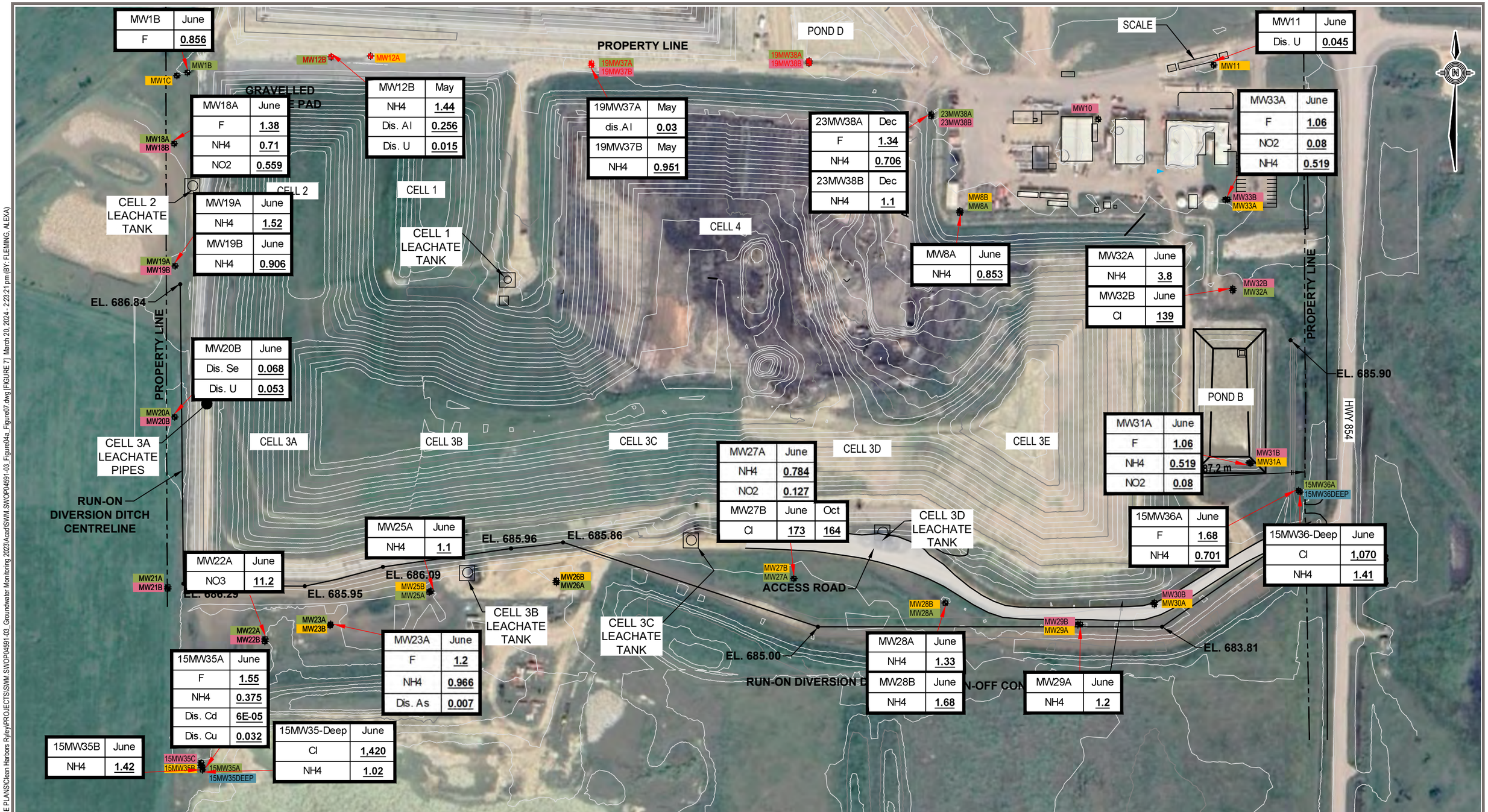
FILE NO.
SWOP04591-03_Figure06d_LowerBedrock.mxd

OFFICE	DWN	CKD	APVD	REV
Tt-EDM	MRB	SL	WW	0

DATE	PROJECT NO.
March 22, 2024	SWM.SWOP04591-03

Figure 6d

G:\SOLID_WASTE\SWOP\SWOP04591-03\GIS\Maps\2023_Groundwater_Monitoring\SWOP04591-03_Figure06d_LowerBedrock.mxd modified 3/22/2024 by MEGAN.BURNS



LEGEND:

- MONITORING WELL LOCATION
- DECOMMISSIONED MONITORING WELL LOCATION
- SURFICIAL MATERIALS
- UPPER SANDSTONE
- CLAY SHALE
- LOWER BEDROCK
- TOPOGRAPHIC CONTOURS

TABLE LEGEND

PARAMETER		UNITS	ABT-GL	MONITORING 2023
CL	CHLORIDE	mg/L	100	##
F	FLUORIDE	mg/L	1	##
NO3	NITRATE	mg-N/L	3	##
NH4	AMMONIA	mg-N/L	0.018-190	##
NO2	NITRITE	mg-N/L	0.02-0.1	##
Dis. Al	DISSOLVED ALUMINUM	mg/L	0.005-0.05	##
Dis. As	DISSOLVED ARSENIC	mg/L	0.005	##
Dis. Cd	DISSOLVED CADMIUM	mg/L	0.00004-0.00037	##
Dis. Cu	DISSOLVED COPPER	mg/L	0.002	##
Dis. Se	DISSOLVED SELENIUM	mg/L	0.002	##
Dis. U	DISSOLVED URANIUM	mg/L	0.01	##

NOTES: [1] ALBERTA TIER 1 GUIDELINE
[2] GUIDELINE VARIES WITH pH AND TEMPERATURE
[3] GUIDELINE VARIES WITH pH
[4] GUIDELINE VARIES WITH HARDNESS

BOLD & UNDERLINED - GREATER THAN REFERENCED GUIDELINE. ELECTRICAL CONDUCTIVITY, SODIUM, TOTAL DISSOLVED SOLIDS, SULPHATE, AND DISSOLVED MANGANESE EXCEEDANCES NOT SHOWN ON THIS FIGURE. MOST WELLS EXCEEDED THE GUIDELINE FOR THESE PARAMETERS IN 2023. pH VALUES ABOVE THE GUIDELINE RANGE ALSO NOT SHOWN.

NOTES
IMAGE FROM GOOGLE EARTH 2024.
EXISTING GROUND SURVEY RECIEVED JUNE 30, 2023

0 100 m
Scale: 1: 2 500

CLIENT
Clean Harbors

TETRA TECH

2023 GROUNDWATER MONITORING PROGRAM RYLEY, ALBERTA

GROUNDWATER EXCEEDANCES PLAN VIEW

PROJECT NO.	DWN	CKD	REV
SWM.SWOP04591-03	MM/DBD	WW	0

OFFICE	DATE
Tt-EDM	January 16, 2024

Figure 7

Q:\Edmonton\Drafting\00_MASTER PROJECT BASE PLANS\Clean Harbors Ryley\PROJECTS\SWM.SWOP04591-03_Groundwater Monitoring 2023\Acad\SWM.SWOP04591-03_Figure04a_Figure07.dwg [FIGURE 7] March 20, 2024 - 2:23:21 pm (BY: FLEMING, ALEXA)

APPENDIX A

REGULATORY APPROVAL – ALBERTA ENVIRONMENT AND RECORD OF SITE CONDITION

Environment and Parks

AMENDING APPROVAL

PROVINCE OF ALBERTA

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

APPROVAL NO. 10348-03-01

APPLICATION NO. 015-10348

EFFECTIVE DATE: June 21, 2022

EXPIRY DATE: March 31, 2027

APPROVAL HOLDER: Clean Harbors Canada, Inc.

Pursuant to Division 2, of Part 2, of the *Environmental Protection and Enhancement Act*, R.S.A.2000, c.E-12, as amended, the approval for the following activity:

> construction, operation and reclamation of 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 amended as per the attached terms and conditions.

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

Date Signed June 21, 2022

TERMS AND CONDITIONS ATTACHED TO APPROVAL

1. *Environmental Protection and Enhancement Act* Approval No. 10348-03-00 is hereby amended by this Amending Approval.

2. Parts 1, 2, 3, 4, 5, 6, 7 and 8 are deleted, and the following are substituted:

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;

TERMS AND CONDITIONS ATTACHED TO 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;

(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) “CAO” means Chief Administrative Officer;

(p) “central waste receiving and stabilization area” means the central waste receiving and stabilization area as described in application No. 015-10348;

(q) “COD” means Chemical Oxygen Demand;

(r) “composite liner” means a liner that meets the specifications in 3.1.2(b) of this approval;

(s) "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;

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

(u) “day”, when referring to sampling, means any sampling period of 24 consecutive hours;

(v) "decommissioning" means the dismantling and decontamination of the facility undertaken subsequent to the termination or abandonment of any

TERMS AND CONDITIONS ATTACHED TO APPROVAL

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;

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

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

(y) “dismantling” means the removal of buildings, structures, process and pollution abatement equipment, vessels, storage facilities, material handling facilities, railways, roadways, pipelines and any other installations that are being or have been used or held for or in connection with the facility;

(z) “DOC” means Dissolved Organic Carbon;

(aa) “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;

(bb) “domestic wastewater system” means the parts of the facility that collect, store, or treat domestic wastewater from the facility;

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

(dd) “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 ¼ and NE ¼ 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;

(ee) “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;

(ff) “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;

TERMS AND CONDITIONS ATTACHED TO APPROVAL

(gg) "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;

(hh) "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;

(ii) "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;

(jj) "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;

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

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

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

(nn) "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;

(oo) "H_2S" means hydrogen sulphide;

(pp) "HDPE" means High Density Polyethylene;

(qq) "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;

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

TERMS AND CONDITIONS ATTACHED TO APPROVAL

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

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

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

(vv) "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;

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

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

(yy) "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;

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

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

(bbb) "laydown area" means the laydown area as described in application No. 015-10348;

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

(ddd) "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;

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

(fff) "leak detection system" means a system that gathers liquid between a primary liner and a secondary liner system, and consists of a permeable

TERMS AND CONDITIONS ATTACHED TO APPROVAL

drainage material, a network of perforated pipes and sumps or manholes from where the liquid can be removed;

(ggg) "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;

(hhh) "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;

(iii) "major ions" means the following:

Calcium	Carbonate
Magnesium	Bicarbonate
Sodium	Chloride
Potassium	Sulfate

(jjj) "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;

(kkk) "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;

(lll) "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

TERMS AND CONDITIONS ATTACHED TO APPROVAL

(mmm) "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;

(nnn) "month" means calendar month;

(ooo) “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;

(ppp) “NAPS” means the National Air Pollution Surveillance program;

(qqq) "new landfill cells" means Cell 3D as described in application No. 005-10348, Cell 3E as described in application No. 012-10348, Cell 4 as described in application No. 014-10348, and Cell 5 as described in application No. 015-10348;

(rrr) "new surface water detention pond" means the surface water detention pond(s) as described in application No. 012-10348 or No. 015-10348;

(sss) “NORM” means Naturally Occurring Radioactive Materials;

(ttt) “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;

(uuu) “nutrients” means the following:

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

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

(www) “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;

(xxx) “PM” means particulate matter;

TERMS AND CONDITIONS ATTACHED TO APPROVAL

(yyy) “PM_{10}” means particulate matter less than 10 microns in diameter;

(zzz) “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;

(aaaa) “post-closure” means the period of time after completion of the final landfill closure;

(bbbb) “ppm” means concentration in parts per million;

(cccc) “primary liner” means the uppermost geomembrane liner;

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

(eeee) "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;

(ffff) “regulations” means the regulations enacted pursuant to the Act, as amended;

(gggg) “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;

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

(iiii) “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 ponds and tank farm bermed area;

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

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

(llll) “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

TERMS AND CONDITIONS ATTACHED TO APPROVAL

are released to the atmosphere as described in the application;

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

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

(oooo) "SOP" means Standard Operating Procedures;

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

(qqqq) "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;

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

(ssss) "TDS" means Total Dissolved Solids;

(tttt) "TNMOCs" means total non-methane organic compounds;

(uuuu) "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;

(vvvv) "total metals" means the following:

Antimony	Cobalt	Selenium
Arsenic	Copper	Silver
Barium	Iron	Thallium
Beryllium	Lead	Tin
Boron	Manganese	Uranium
Cadmium	Mercury	Vanadium
Chromium	Nickel	Zinc

(wwww) "TSP" means total suspended particulate matter;

(xxxx) "TSS" means Total Suspended Solids;

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(yyyy) "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;

(zzzz) "VOCs" means volatile organic compounds;

(aaaaa) "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;

(bbbbb) "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 or No. 015-10348;

(ccccc) "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;

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

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

(fffff) "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.

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;

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(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,

(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.

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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

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,

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(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, 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:

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(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.

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.

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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:

(a) Cell 4, unless and until updated financial security of the facility has been provided to the Director to include Cell 4; and

(b) Cell 5, unless and until updated financial security of the facility has been provided to the Director to include Cell 5.

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 geo-composite drainage layer placed in direct contact with an underlying 80 mil HDPE geomembrane liner as a primary liner;

(ii) a geo-composite drainage layer placed in direct contact with an underlying 80 mil HDPE geomembrane liner as a secondary liner; and

(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;

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(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 x 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 x 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

(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

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(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 For any new landfill cell(s) to be constructed below the native ground surface in the NE 09-050-17-W4M area of the facility, the approval holder shall construct the cell(s) in the following manner:

(a) shallow groundwater shall be dewatered and managed to ensure that construction specifications for the composite liner system referred to in 3.1.2 shall not be compromised;

(b) measures of groundwater dewatering and management during construction shall be documented, and the document shall be maintained as part of the documentation for construction of the composite liner system;

(c) the integrity of the composite liner system shall be verified and maintained to function as designed, and the verification shall be documented; and

(d) the documentation referred to in (b) and (c) above shall be submitted as part of the summary report required in 3.1.9.

3.1.4 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.

3.1.5 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.

3.1.6 If the Detailed Construction Plan and Specifications in 3.1.5 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.

3.1.7 The approval holder shall implement the Detailed Construction Plan and Specifications in 3.1.5 as authorized in writing by the Director.

3.1.8 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 3.1.7, unless the following conditions are met:

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(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.

3.1.9 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.

3.1.10 The summary report in 3.1.9 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 3.1.7, subject to the deviations as per 3.1.8;

(b) description of any minor deviations as per 3.1.8;

(c) confirmation by the professional registered with APEGA, that deviations as per 3.1.8 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;

(f) documentation required in 3.1.3; and

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

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

3.1.12 The approval holder shall construct the new surface water detention pond(s) in the:

(a) SE 09-050-17-W4M area of the facility as described in application No. 012-10348; and

(b) NE 09-050-17-W4M area of the facility as described in application No. 015-10348 with a clay liner that has:

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

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

unless otherwise authorized in writing by the Director.

3.1.13 The approval holder shall construct the laydown area in the NE 09-050-17-W4M area of the facility as described in application No. 015-10348, unless otherwise authorized in writing by the Director.

3.1.14 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 RECEIVING AND STABILIZATION AREAS

3.2.1 The approval holder shall construct the waste receiving area(s) in the SE 09-050-17-W4M area of the facility as described in the application, unless otherwise authorized in writing by the Director.

3.2.2 The approval holder shall construct the waste stabilization area(s) in the SE 09-050-17-W4M area of the facility 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.

3.2.3 The approval holder shall construct the central waste receiving and stabilization area in the NE 09-050-17-W4M area of the facility as described in application No. 015-10348, unless otherwise authorized in writing by the Director.

3.2.4 The approval holder shall decommission and reclaim the waste receiving and stabilization area(s) in the SE 09-050-17-W4M area of the facility upon completing:

(a) construction; and

(b) commissioning

of the central waste receiving and stabilization area in the NE 09-050-17-W4M area of the facility, 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 facility to that located within SE ¼ and NE ¼ of Section 09, Township 050, 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),

(C) waste receiving area(s), and

(D) waste stabilization area(s); 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 4.6.60(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.

FACILITY WILDLIFE MANAGEMENT PLAN

4.1.10 The approval holder shall:

(a) develop; and

(b) implement

a Facility Wildlife Management Plan at the facility to keep wildlife away from exposed waste areas within 120 days of the issuance of this approval, unless otherwise authorized in writing by the Director.

4.1.11 The approval holder shall:

(a) review the Facility Wildlife Management Plan annually; and

(b) update the Facility Wildlife Management Plan if any of the following circumstances apply:

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

(ii) an update is requested in writing by the Director.

4.1.12 The approval holder shall retain a copy of the most recent Facility Wildlife Management Plan at the facility.

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

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4.1.14 If the Facility Wildlife Management Plan submitted pursuant to 4.1.13 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.

4.1.15 The approval hold shall implement the latest Facility Wildlife Management Plan, unless otherwise authorized in writing by the Director.

COMMUNITY COMPLAINT RESPONSE PLAN

4.1.16 The approval holder shall:

(a) develop; and

(b) implement

a Community Complaint Response Plan at the facility within 90 days of the issuance of this approval, unless otherwise authorized in writing by the Director.

4.1.17 The approval holder shall include, at a minimum, all of the following in the Community Complaint Response Plan referred to in 4.1.16:

(a) procedures and methods to be taken to respond to the complaint, which shall include but not limited to the following:

(i) recording of the complaint,

(ii) reviewing of the complaint records and other relevant information,

(iii) investigation of the complaint, and

(iv) timeline and follow-up actions for responding to the complaint based on the findings of the complaint review and investigation;

(b) the recording of the complaint referred to in (a)(i) above shall include but not limited to the following:

(i) contact information of the complainant(s) (names, phone numbers, e-mails and addresses),

(ii) detailed description of the event for which the complaint is filed,

(iii) date and time of the event occurring,

(iv) location where the event is noticed, and direction and distance of the event location relative to the facility,

(v) wind direction and speed at the facility, and

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(vi) other local meteorological information at the time of the event occurring;

(c) the reviewing of the complaint referred to in (a)(ii) above shall include but not limited to the following:

(i) reviewing complaint records,

(ii) reviewing the facility operating records,

(iii) reviewing additional local meteorological data, and

(iv) timeline for reviewing the complaint;

(d) the investigation of the complaint referred to in (a)(iii) above shall include but not limited to the following:

(i) meeting complainant(s) to obtain further information related to the complaint,

(ii) visiting other local residents to collect additional information,

(iii) assessing other activities in the vicinity of the facility that may have potential for causing the event, and

(iv) timeline for the complaint investigation;

(e) the timeline and follow-up actions referred to in (a)(iv) above shall include but not limited to the following:

(i) timeline for responding to the complaint; and

(ii) follow-up actions:

(A) if the complaint is found to be related to the facility operations, the follow-up actions shall include:

(A.1) notifying the complainant(s) of the findings of the complaint review and investigation within the timeline specified in (i) above,

(A.2) taking immediate measures to correct the source(s) of the compliant,

(A.3) taking measures to prevent the issue from occurring again in future, and

(A.4) providing a summary of the complaint review and investigation in the Annual Landfill Operations Report pursuant to 4.6.60(n); or

(B) if the complaint is found not to be related to the facility operations, the follow-up actions shall include:

(B.1) notifying the complainant(s) of the findings of the complaint review and investigation within the timeline specified in (i) above, and

(B.2) providing a summary of the complaint review and investigation in the Annual Landfill Operations Report pursuant to 4.6.60(n).

4.1.18 The approval holder shall:

(a) review the Community Complaint Response Plan annually; and

(b) update the Community Complaint Response Plan if any of the following circumstances apply:

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

(ii) an update is requested in writing by the Director.

4.1.19 The approval holder shall retain a copy of the most recent Community Complaint Response Plan at the facility.

4.1.20 The approval holder shall submit a copy of the most recent Community Complaint Response Plan to the Director upon written request from the Director within the timeline specified in writing by the Director.

4.1.21 If the Community Complaint Response Plan submitted pursuant to 4.1.20 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.

4.1.22 The approval hold shall implement the latest Community Complaint Response Plan, unless otherwise authorized in writing by the Director.

PARTICIPATION IN DEVELOPMENT OF LOCAL EMERGENCY MANAGEMENT PLANS

4.1.23 The approval holder shall support the Village of Ryley and Beaver County in the development of Local Emergency Management Plans by providing assistance to the Village and County in, at a minimum, all of the following:

(a) identifying hazards at the facility;

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(b) assessing degree of risk of the hazards at the facility;

(c) suggesting risk mitigation measures;

(d) offering input to development of emergency notification and emergency evacuation procedures for local residents;

(e) keeping the Village and County updated for any major new development at the facility; and

(f) advising the Village and County of the need for updating the Local Emergency Management Plans following any major new development at the facility.

FACILITY EMERGENCY MANAGEMENT PLAN

4.1.24 The approval holder shall:

(a) develop; and

(b) implement

a Facility Emergency Management Plan at the facility within 90 days of the issuance of this approval, unless otherwise authorized in writing by the Director.

4.1.25 The Facility Emergency Management Plan referred to in 4.1.24 shall include, at a minimum, all of the following:

(a) identification of hazards at the facility;

(b) assessment of degree of risk and impact of hazards at the facility;

(c) preventative measures for hazards at the facility;

(d) mitigation measures for hazards at the facility;

(e) emergency preparedness at the facility;

(f) procedures for emergency management at the facility; and

(g) emergency notification and emergency evacuation procedures for local residents.

4.1.26 The approval holder shall:

(a) review the Facility Emergency Management Plan annually; and

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(b) update the Facility Emergency Management Plan if any of the following circumstances apply:

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

(ii) an update is requested in writing by the Director.

4.1.27 The approval holder shall retain a copy of the most recent Facility Emergency Management Plan at the facility.

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

4.1.29 If the Facility Emergency Management Plan submitted pursuant to 4.1.28 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.

4.1.30 The approval hold shall implement the latest Facility Emergency Management Plan, unless otherwise authorized in writing by the Director.

COMMUNITY ACCESIBLE WEBSITE

4.1.31 The approval shall:

(a) develop; and

(b) maintain

a community accessible website available to all local residents within 120 days of the issuance of this approval, unless otherwise authorized in writing by the Director.

4.1.32 The community accessible website referred to in 4.1.31 shall include, at a minimum, all of the following information:

(a) Annual Landfill Operations Reports (including the three-year compliance audit report, Annual Dugout and Water Well Sampling Program Report, and Annual Landfill Cell Closure Report, etc.);

(b) Monthly Waste Management Report, and Annual Waste Management Summary Report;

(c) Monthly Ambient Air Monitoring Report, and Annual Ambient Air Monitoring Report;

(d) Monthly Runoff and Industrial Wastewater Report, and Annual Runoff and Industrial Wastewater Report;

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(e) Annual Groundwater Monitoring Program Report;

(f) Soil Monitoring Program Report, and Soil Management Program Report;

(g) Facility Wildlife Management Plan;

(h) Community Complaint Response Plan;

(i) regulatory correspondences for incidents and complaints;

(j) correspondences made to Alberta Environment and Parks and copied CAOs at the Village of Ryley and Beaver County;

(k) Facility Emergency Management Plan, including emergency notification and emergency evacuation procedures;

(l) Village of Ryley Emergency Management Plan, including emergency notification and emergency evacuation procedures;

(m) Beaver County Emergency Management Plan, including emergency notification and emergency evacuation procedures; and

(n) any other information as requested in writing by the Director.

4.1.33 The approval holder shall:

(a) review the community accessible website annually; and

(b) update the website if any of the following circumstances apply:

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

(ii) an update is requested in writing by the Director.

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;

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(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.

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:

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(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:

(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 in 4.6.34(l).

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.

SOURCE 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.

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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

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

AMBIENT AIR MONITORING AND REPORTING

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 4.2.21.

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 4.2.21.

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

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

4.2.17 The approval holder shall submit an enhanced Ambient Air Quality Monitoring Program to the Director within 90 days of the issuance of this approval, unless otherwise authorized in writing by the Director.

4.2.18 The approval holder shall include, at a minimum, all of the following in the enhanced Ambient Air Quality Monitoring Program referred to in 4.2.17:

(a) three (3) intermittent ambient air quality monitoring stations:

(i) the existing Highway 854 station,

(ii) the existing Ryley School station, and

(iii) the existing Facility Site station, to be relocated as authorized in writing by the Director;

(b) the following monitoring parameters for the existing Highway 854 station:

(i) TSP,

(ii) PM_{10} (for 2 year transition from PM_{10} to TSP, starting from authorization of the enhanced Ambient Air Quality Monitoring Program by the Director),

(iii) total metals in:

(A) TSP, and

(B) PM_{10} (for 2 year transition from PM_{10} to TSP, starting from authorization of the enhanced Ambient Air Quality Monitoring Program by the Director),

if concentration of TSP or PM_{10} exceeds 50 $\mu g/m^3$,

(iv) VOCs, and

(v) TNMOCs;

(c) the following monitoring parameters for the Ryley School and Facility Site stations:

(i) TSP, and

(ii) total metals in TSP, if concentration of TSP exceeds 50 $\mu g/m^3$; and

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(d) the following monitoring frequencies for the three (3) stations referred to in (a) above:

(i) for the Highway 854 station, once every six (6) days in alignment with the NAPS sampling schedule, and

(ii) for the Ryley School and Facility Site stations, linking the two (2) stations in such a way that the two (2) stations will collect air samples whenever the wind direction is oriented in a northeast to southwest direction.

4.2.19 The approval holder shall include a minimum of one (1) meteorological station in each of the Ryley School and Facility Site intermittent ambient air quality monitoring stations referred to in 4.2.18(a) that measures and records, at a minimum, all of the following parameters:

(a) wind speed; and

(b) wind direction.

4.2.20 If the revised:

(a) Ambient Air Monitoring Program;

(b) reporting requirements; or

(c) both of the above

submitted pursuant to 4.2.16 or 4.2.17 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.

4.2.21 The approval holder shall implement the revised:

(a) Ambient Air Monitoring Program;

(b) reporting requirements; or

(c) both of the above

submitted pursuant to 4.2.16 or 4.2.17 as authorized in writing by the Director within the timeline specified in writing by the Director.

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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, for the SE 09-050-17-W4M area of the facility, prior to decommissioning and reclamation of the old surface water detention pond;

(b) application No. 014-10348, for the SE 09-050-17-W4M area of the facility, after decommissioning and reclamation of the old surface water detention pond; and

(c) application No. 015-10348, for the NE 09-050-17-W4M area of the facility;

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 4.3.8, 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 4.3.12; and

(b) through

(i) 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 in the SE 09-050-17-W4M area of the facility, under normal operating conditions; or

(ii) 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 new surface water detention pond in the SE 09-050-17-W4M area of the facility;

unless otherwise authorized in writing by the Director.

4.3.5 Subject to 4.3.8, the approval holder shall only make or permit a release from the new surface water detention pond in the SE 09-050-17-W4M area of the facility:

(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 in the SE 09-050-17-W4M area of the facility, and

(ii) referred to as sampling location B1 in 4.3.12; 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 Subject to 4.3.8, the approval holder shall only make or permit a release from each of the new surface water detention pond(s) in the NE 09-050-17-W4M area of the facility:

(a) through a pump and a release hose into the drainage control ditch, east of the landfill access road, to the new surface water detention pond in the SE 09-050-17-W4M area of the facility, under normal operating conditions; or

(b) through a pump and a release hose directly to the culvert under Highway 854, during periods of high runoff exceeding the holding capacity of the new surface water detention pond in the SE 09-050-17-W4M area of the facility;

unless otherwise authorized in writing by the Director.

4.3.7 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;

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(c) to a disposal well approved by AER;

(d) as per 4.6.52; 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.

LIMITS

4.3.8 Releases of runoff:

(a) from the old surface water detention pond to the surrounding watershed;

(b) from the new surface water detention pond in the SE 09-050-17-W4M area of the facility to the surrounding watershed;

(c) from each of the new surface water detention pond(s) in the NE 09-050-17-W4M area of the facility to the surrounding watershed, or to the new surface water detention pond in the SE 09-050-17-W4M area of the facility; or

(d) from any combination of the above

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

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

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

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4.3.9 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-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

MONITORING AND REPORTING

4.3.10 The approval holder shall monitor the runoff control system as required in TABLE 4.3-D, subject to 4.3.13.

4.3.11 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 4.3.13.

4.3.12 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 release point of the new surface water detention pond in the SE 09-050-17-W4M area of the facility;

(d) sampling location B2 is defined as the new surface water detention pond in the SE 09-050-17-W4M area of the facility;

(e) sampling location C1 is defined as the release point of each of the new surface water detention pond(s) in the NE 09-050-17-W4M area of the facility;

(f) sampling location C2 is defined as each of the new surface water detention pond(s) in the NE 09-050-17-W4M area of the facility; and

(g) sampling location D is defined as the tank farm bermed area.

4.3.13 The monitoring and reporting requirements in 4.3.10 and 4.3.11 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 Ponds				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, C1		
pH	Once per batch release, prior to release	Representative Grab	A2, B2, C2		
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	D		
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			

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

(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.

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4.3.15 The approval holder shall:

(a) treat any acute lethality test that deviates from the corresponding test method referred to in 4.3.14 as invalid; and

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

4.3.16 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.

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

4.3.18 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

(ii) specified runoff

as per 4.3.7;

(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

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

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

4.3.20 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 4.3.7;

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

(f) an annual summary of the results pursuant to 4.3.22;

(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.

4.3.21 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 each of the new surface water detention ponds at least once per year; and

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

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

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

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 4.6.52.

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:

(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 4.6.52.

TERMS AND CONDITIONS ATTACHED TO APPROVAL

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.

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.

TERMS AND CONDITIONS ATTACHED TO APPROVAL

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.

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

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 4.6.60(i).

SECTION 4.6: HWRSP FACILITY AND LANDFILL

GENERAL

4.6.1 The approval holder shall not:

(a) receive;

(b) process;

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(c) dispose of; or

(d) perform any combination of the above for

any of the following wastes, individually or in any combination, at the respective locations specified below:

(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;

(viii) NORM waste, at the facility;

(ix) waste generating offensive odours, at the facility, unless and until effective control measures are provided to prevent releases of offensive odours to the outside of the facility fenceline.

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.

HWRSP FACILITY

OPERATIONS PLAN

4.6.4 The approval holder shall:

(a) develop;

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(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.

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;

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(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;

(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.

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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;

(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.

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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:

(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

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(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.

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

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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.

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.

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

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(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.

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,

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(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) SOP for lab screening of pyrophoric wastes for water quenching;

(k) SOP for water quenching treatment of pyrophoric wastes;

(l) an Odour and Fugitive Dust Response Program, including odour from the HWRSP Facility;

(m) a Fugitive Dust and Odour Best Management Plan, including odour from the HWRSP Facility;

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

(o) a leachate monitoring and management program;

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

(q) a groundwater monitoring program;

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

(s) a soil monitoring program;

(t) a soil management program;

(u) a landfill cell cover system;

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

(w) a health and safety program;

(x) a Facility Wildlife Management Plan, pursuant to 4.1.15;

(y) a Community Complaint Response Plan, pursuant to 4.1.22;

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(z) a Facility Emergency Management Plan, pursuant to 4.1.30; and

(aa) 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 include, at a minimum, all of the following in the SOP referred to in 4.6.34(j) for lab screening of pyrophoric wastes to assess the suitability of using water quenching to neutralize the reactivity of the pyrophoric wastes:

(a) procedures and methods for obtaining representative pyrophoric wastes sample for lab test;

(b) procedures and methods for conducting lab screening test using representative sample of pyrophoric wastes, including:

(i) setup of lab test equipment,

(ii) test procedures,

(iii) collection of samples of off-gases from lab water quenching test,

(iv) screening parameters, including, at a minimum, odour, ammonia, H_2S, PM, total metals, VOCs, TNMOCs, and total hydrocarbons, and

(v) analytical methods for testing the screening parameters;

(c) assessment of lab test results and passing criteria for screening; and

(d) documentation and record keeping of lab screening test results.

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

4.6.37 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.

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

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

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OPERATIONS

4.6.40 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.

4.6.41 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.

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

4.6.43 The approval holder:

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

(b) shall only operate waste:

(i) receiving, and

(ii) stabilization

area(s) as descried in the application;

(c) shall not transfer waste from the waste stabilization area to the Class I landfill cell before the waste stabilization or solidification or both have been completed; and

(d) may treat pyrophoric wastes by water quenching only within the waste stabilization area, subject to passing lab screening criteria;

unless otherwise authorized in writing by the Director.

4.6.44 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.

4.6.45 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.

4.6.46 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.

4.6.47 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.

4.6.48 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.

4.6.49 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.

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

4.6.51 For any waste disposed of at the landfill that is subject to wind dispersal or release of offensive odours or both, the approval holder shall:

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

(b) immediately apply effective cover on top of the waste to control releases of:

(i) particulate matter, and

(ii) offensive odours.

4.6.52 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;

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

4.6.53 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.

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4.6.54 The approval holder shall:

(a) keep a record of inspections conducted pursuant to 4.6.53;

(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 4.6.53 to the Director in writing along with any corrective measures taken or proposed.

4.6.55 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.

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

4.6.57 The approval holder shall operate the laydown area in the NE 9-50-17 W4M area of the facility only as described in the application.

MONITORING AND REPORTING

4.6.58 The approval holder shall monitor the landfill operations as required in TABLE 4.6-D.

4.6.59 The approval holder shall report to the Director the results of the landfill operations monitoring as required in TABLE 4.6-D.

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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	

4.6.60 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;

(d) a summary of the operations of the waste stabilization area;

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(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(r);

(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

  (iv) the location of new landfill cell(s) constructed;

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(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.

4.6.61 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

BASELINE MONITORING AND REPORTING

4.9.1 The approval holder shall submit a proposal for a Baseline Groundwater Monitoring Program for the NE 9-50-17 W4M area of the facility on or before October 31, 2022, unless otherwise authorized in writing by the Director.

4.9.2 If the Baseline Groundwater Monitoring Program proposal submitted pursuant to 4.9.1 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.

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4.9.3 The approval holder shall implement the Baseline Groundwater Monitoring Program referred to in 4.9.1 as authorized in writing by the Director prior to commencing operation of any new landfill cell(s) in the NE 9-50-17 W4M area of the facility, unless otherwise authorized in writing by the Director.

4.9.4 The approval holder shall submit a Baseline Groundwater Monitoring Program Report to the Director within six (6) months of completing the Baseline Groundwater Monitoring Program, unless otherwise authorized in writing by the Director.

MONITORING

4.9.5 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 4.9.8.

4.9.6 The approval holder shall submit a revised Groundwater Monitoring Program to the Director on or before December 31, 2022, unless otherwise authorized in writing by the Director.

4.9.7 If the revised Groundwater Monitoring Program submitted pursuant to 4.9.6 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.

4.9.8 The approval holder shall implement the revised Groundwater Monitoring Program submitted pursuant to 4.9.6 as authorized in writing by the Director within the timeline specified in writing by the Director.

4.9.9 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

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4.9.10 The monitoring required in 4.9.9 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 4.9.11, and until the levels specified in 4.9.11 have been met.

4.9.11 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.

4.9.12 The approval holder shall implement the Remediation Plan as specified in the Landfill Operations Plan, when groundwater quality exceeds the groundwater performance criteria in 4.9.11.

4.9.13 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.

4.9.14 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.

4.9.15 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.

4.9.16 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.

4.9.17 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

(b) *Alberta Tier 2 Soil and Groundwater Remediation Guidelines*, Alberta Environment, February 2009, as amended.

REPORTING

4.9.18 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;

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(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 4.9.9 and 4.9.15(b);

(o) a summary of fluid elevations recorded as required in 4.9.16(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.

4.9.19 The approval holder shall submit the Annual Groundwater Monitoring Program Report to the Director.

4.9.20 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.

TERMS AND CONDITIONS ATTACHED TO APPROVAL

BASELINE MONITORING AND REPORTING

4.10.2 The approval holder shall submit a proposal for a Baseline Soil Monitoring Program for the NE 9-50-17 W4M area of the facility on or before October 31, 2022, unless otherwise authorized in writing by the Director.

4.10.3 If the Baseline Soil Monitoring Program proposal submitted pursuant to 4.10.2 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.

4.10.4 The approval holder shall implement the Baseline Soil Monitoring Program referred to in 4.10.2 as authorized in writing by the Director prior to commencing operation of any new landfill cell(s) in the NE 9-50-17 W4M area of the facility, unless otherwise authorized in writing by the Director.

4.10.5 The approval holder shall submit a Baseline Soil Monitoring Program Report to the Director within six (6) months of completing the Baseline Soil Monitoring Program, unless otherwise authorized in writing by the Director.

MONITORING AND REPORTING

4.10.6 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.

4.10.7 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.

4.10.8 Subject to 4.10.7, the approval holder shall implement the Soil Monitoring Program as authorized in writing by the Director.

4.10.9 If an authorization or a deficiency letter is not issued within 120 days of the applicable date required by 4.10.6, 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 4.10.6.

TERMS AND CONDITIONS ATTACHED TO APPROVAL

4.10.10 The approval holder shall submit to the Director each Soil Monitoring Program Report obtained from the soil monitoring referred to in 4.10.8 and 4.10.9 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.

4.10.11 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

4.10.12 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.

4.10.13 If a Soil Management Program Proposal is required pursuant to 4.10.12, 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 4.10.10(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 4.10.10(b); or

(c) for any other soil monitoring event not specified in this approval within six months of completion of the soil monitoring event.

4.10.14 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.

4.10.15 The approval holder shall implement the Soil Management Program as authorized in writing by the Director.

4.10.16 If the approval holder is required to implement a Soil Management Program pursuant to 4.10.15, the approval holder shall submit a written Soil Management

TERMS AND CONDITIONS ATTACHED TO APPROVAL

Program Report to the Director on or before March 31 of each year following the year in which the information was collected.

4.10.17 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:

(iii) for soil or groundwater, *Alberta Tier 1 Soil and Groundwater Remediation Guidelines*, Alberta Environment, February 2009, as amended,

(iv) for soil or groundwater, *Alberta Tier 2 Soil and Groundwater Remediation Guidelines*, Alberta Environment, February 2009, as amended,

(v) for drinking water, *Canadian Environmental Quality Guidelines*, Canadian Council of Ministers of the Environment, PN 1299, 1999, as amended, and

(vi) 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 4.6.60.

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.

June 21, 2022
DATE SIGNED

DESIGNATED DIRECTOR UNDER THE ACT
Mohammad Habib, P. Eng.

Alberta Environment and Protected Areas

Regulatory Assurance Division
Southern Region – Red Deer
304 4920 51 Street
Red Deer AB T4N 6K8
Telephone: 403-340-7052
Fax: 403-340-5022
https://www.alberta.ca

June 6, 2023

File No. 10348-03-01 Authorization

Stan Yuha, Facility Manager
Ryley Industrial Waste Management
Clean Harbors Canada Inc.
PO Box 390
Ryley, AB T0B 4A0
Email: yuha.stan@cleanharbors.com

Dear Mr. Yuha:

RE: Application for the Director's Authorization for Decommissioning Groundwater Monitoring Wells – Cell 5 Development Area
Clean Harbors Ryley Industrial Waste Management Facility
EPEA Approval No. 10348-03-01

Alberta Environment and Protected Areas (the Department) has reviewed the referenced application and dated May 29, 2023, submitted by Tetra Tech Canada on behalf of Clean Harbors Canada. It is the Department's understanding that:

- The above-mentioned groundwater monitoring wells need to be decommissioned immediately due to ongoing (2023) cell 5 construction that was authorized by the Director in May 2023.
- The plan for decommissioning and replacing the monitoring wells was included in revised Groundwater Monitoring Program (GMP; submitted to the Department in December 2022) that is to be reviewed and authorized by the Director.
- For the monitoring wells are to be decommissioned, current year (2023) samples were either collected already or will be collected from suitable replacement wells later in 2023.
- With the wells being decommissioned, the facility will still meet 2023 groundwater monitoring requirements of the revised GMP (and the Approval).

In accordance with Approval 10348-03-01 Section 4.9.15, Clean Harbors Canada is hereby authorized to carry out the decommissioning work as described in the application.

If you have any questions on the above matter, please contact Julian Huang, Municipal Approvals Engineer, at (403) 340-4988.

Sincerely,

Todd Aasen, P. Eng.
Approvals Manager
Designated Director under the Act

cc: Sean Buckles, Tetra Tech Canada, email: Sean.Buckles@tetratech.com

Alberta Environment and Protected Areas

Regulatory Assurance Division
Southern Region – Red Deer
304 4920 51 Street
Red Deer AB T4N 6K8
Telephone: 403-340-7052
https://www.alberta.ca

July 13, 2023

File No. 10348-03-01
Authorization

Stan Yuha
Facility Manager
Ryley Industrial Waste Management
Clean Harbors Canada Inc.
P.O. Box 390
Ryley, AB T0B 4A0
Email: yuha.stan@cleanharbors.com

Dear Mr. Yuha:

RE: Application for the Director's Authorization of Proposed Baseline Groundwater Monitoring Program Clean Harbors Ryley Industrial Waste Management Facility *EPEA* Approval No. 10348-03-01

Alberta Environment and Protected Areas has reviewed the above referenced application submission, prepared by Tetra Tech Canada Inc. on behalf of Clean Harbors Canada Inc., dated October 28, 2022.

In accordance with Approval 10348-03-01 Section 4.9.3, Clean Harbors Canada Inc. is hereby authorized to implement the above-mentioned Groundwater Monitoring Program.

If you have any questions on the above matter, please contact Julian Huang, Municipal Approvals Engineer, at (403) 340-4988.

Sincerely,

Todd Aasen, P.Eng.
Approvals Manager
Designated Director under the Act

cc: Sean Buckles, Tetra Tech Canada Inc.

Record of Site Condition

1 REPORT AND FORM INFORMATION

Title of report	2023 Groundwater Monitoring Program, Ryley Class I Waste Management Facility, Ryley, Alberta		
Report date (*dd-mon-yyyy*)	22-03-2024	Record of Site Condition (RSC) ID No.Ψ	

2 SITE IDENTIFICATION AND PHYSICAL LOCATION

2.1 Site name	Ryley Industrial Waste Management Facility		
2.2 Address of site	P.O. Box 390		
	Municipality	Ryley	**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
			NE	1/4	9	50	17	W4
			SE	1/4	9	50	17	W4

3 STAKEHOLDERS

3.1 Operator

Company	Clean Harbors Canada Inc.	Contact person	Stan Yuha
Mailing address	P.O. Box 390, Ryley AB T0B 4A0	Position held	Facility Manager
		Business phone No.	780.663.3828
		Business fax No.	
		Business e-mail	Yuha.Stan@cleanharbors.com

3.2 Consultant ☐ Not applicable

Company	Tetra Tech Canada Inc.	Contact person	Sean Buckles
Mailing address	**Suite 110, 140 Quarry Park Blvd SE, Calgary AB T2C 3G3**	Position held	Senior Project Engineer
		Business phone No.	403.203.3355
		Business fax No.	
		Business e-mail	Sean.Buckles@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*) _____		

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)		AER approval No.(s)	10348-03-01

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)*: Class I and Class II Industrial Landfill and Hazardous Waste/Recyclable Storage and Processing Facility				

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*): **Compounds generally identified as >Tier 1 but are naturally ocurring, remediation not required**

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*): baseline and background chemistry at the site, historical results/trends

6.3.2 What land use classification(s) is used?

☐ Natural ☒ Agricultural ☐ Residential ☐ Commercial ☐ Industrial ☐ Other (*specify:*_____)

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 $\times 10^{-7}$ m/sec.) for the 5.0 m vertical layer from the bottom of the contaminated zone.

_____($\times 10^{-7}$ 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: **1.0** (m) Deepest: 12.6(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.:* radial (refer to fig 6a in report) ☐ 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)*: irrigation, livestock

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*) (as noted, any offsite concentrations >Tier 1 interpreted to be naturally ocurring

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)*: not tested; expected to be same, naturally occurring exceedances (and pathways) as noted onsite

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 Industrial Waste Management 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[ǂ] 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 ǂ:

"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 Canada Inc.	Stan Yuha	Facility Manager	Stan Yuha	25-MAR-2024
Name of operator	Name of authorized representative	Title of authorized representative (*e.g. officer, director*)	Signature	Date (*dd-mon-yyyy*)

APPENDIX B

WATER WELL/SURFACE WATER SEARCH RESULTS AND REGIONAL GEOLOGY/HYDROGEOLOGY

Appendix B-1: Water Well Search Summary

GIC Well ID	Eliminate?	Status	Type of Work	Use	Well Owner	Date Completed	LSD	SEC	TWP	RGE	M	Drilling Company	Depth (m)
94701	No	Confirm location/use	New Well	Domestic & Industrial	ABRAHAM, JOE	1986-05-01	WH	4	50	17	4	MERV'S WATER WELL DRILLING	120.4
94710	No	Confirm location/use	Federal Well Survey	Domestic & Stock	HOSTLUND		4	9	50	17	4	UNKNOWN DRILLER	4.27
94714	No	Confirm location/use	Chemistry	Domestic	GARSTAD, MARK		SW	10	50	17	4	UNKNOWN DRILLER	67.06
94748	No	Confirm location/use	Chemistry	Domestic	BROOKS, ROBERT			16	50	17	4	UNKNOWN DRILLER	45.72
286840	No	Confirm location/use	New Well	Domestic	PEPPES, RONALD	1997-05-14	4	10	50	17	4	LOSNESS DRILLING (1975) LTD.	82.3
94704	No	Confirm location/use	New Well	Industrial	ANDRUKOW FARM SALES LTD	1986-10-02		4	50	17	4	ALF'S DRILLING & SUPPLIES LTD.	132.59
94700	Yes	Decommissioned	Existing Well-Decommissioned	Unknown	BEAVER COUNTY		NW	3	50	17	4	HOLLAND WATER WELLS	106.68
94711	Yes	Decommissioned	Test Hole-Decommissioned	Unknown	C.E. MOELL CONSULTING LTD#1	1983-01-31	NE	9	50	17	4	BIG QUILL DRILLING LTD.	90.53
94712	Yes	Decommissioned	Test Hole-Decommissioned	Unknown	C.E. MOELL CONSULTING LTD#2	1983-02-01	NE	9	50	17	4	BIG QUILL DRILLING LTD.	90.53
1888439	Yes	Decommissioned	Existing Well-Decommissioned	Unknown	C.E. MOELL & ASSOCIATES	2020-08-04	SE	10	50	17	4	HILL DRILLING LTD.	46.33
94699	Yes	House was demolished	Chemistry	Domestic & Stock	MIZERA, RUDY		SW	3	50	17	4	UNKNOWN DRILLER	60.96
94700	Yes	House was demolished	Chemistry	Domestic	MIZERA, RUDY		NW	3	50	17	4	UNKNOWN DRILLER	106.68
94709	Yes	Property sold to Laidlaw (Clean Harbors)	Chemistry	Unknown	MAGNUSSEN, E.		SE	9	50	17	4	UNKNOWN DRILLER	7.32
94702	Yes?	No Record	Chemistry	Municipal	RYLEY, VILL OF		NE	4	50	17	4	UNKNOWN DRILLER	15.24
94703	Yes?	No Record	Chemistry	Municipal	RYLEY, VILL OF		NE	4	50	17	4	UNKNOWN DRILLER	60.96
232795	Yes	Observation/Investigation Well	Test Hole	Investigation	ALTA ENV #2132E	1983-01-27	NE	10	50	17	4	ALBERTA ENVIRONMENT/EARTH SCIENCES DIVISION	91.44
232797	Yes	Observation/Investigation Well	Test Hole	Investigation	ALTA ENV #2134E	1983-01-27	NE	10	50	17	4	ALBERTA ENVIRONMENT/EARTH SCIENCES DIVISION	60.96
232798	Yes	Observation/Investigation Well	Test Hole	Investigation	ALTA ENV #2135E	1983-01-28	NE	10	50	17	4	ALBERTA ENVIRONMENT/EARTH SCIENCES DIVISION	60.96
232800	Yes	Observation/Investigation Well	Test Hole	Investigation	ALTA ENV #2142	1983-01-27	NW	10	50	17	4	ALBERTA ENVIRONMENT/EARTH SCIENCES DIVISION	60.35
159228	Yes	Observation/Investigation Well	New Well	Domestic & Industrial	LAIDLAW ENVIRONMENTAL SVC LTD	1991-09-07	SE	9	50	17	4	LAKELAND DRILLING LTD.	140.21
1888439	Yes	Observation/Investigation Well	New Well	Domestic	C.E. MOELL & ASSOCIATES LTD.	2004-04-13	SE	10	50	17	4	HILL DRILLING LTD.	46.33
1889172	Yes	Observation/Investigation Well	Piezometer	Monitoring	BEAVER MUNICIPAL SOLUTIONS	2013-05-21	9	10	50	17	4	HILL DRILLING LTD.	36.88
1889173	Yes	Observation/Investigation Well	Piezometer	Monitoring	BEAVER MUNICIPAL SOLUTIONS	2013-05-21	10	10	50	17	4	HILL DRILLING LTD.	5.49
1889174	Yes	Observation/Investigation Well	Piezometer	Monitoring	BEAVER MUNICIPAL SOLUTIONS	2013-05-22	10	10	50	17	4	HILL DRILLING LTD.	10.06
1889175	Yes	Observation/Investigation Well	Piezometer	Monitoring	BEAVER MUNICIPAL SOLUTIONS	2013-05-22	10	10	50	17	4	HILL DRILLING LTD.	21.34
94717	Yes	Observation/Investigation Well	Piezometer	Observation	ALTA ENV #2143E	1983-01-27	NW	10	50	17	4	ALBERTA ENVIRONMENT/EARTH SCIENCES DIVISION	29.87
94718	Yes	Observation/Investigation Well	Piezometer	Observation	ALTA ENV #2144E	1983-01-27	NW	10	50	17	4	ALBERTA ENVIRONMENT/EARTH SCIENCES DIVISION	42.37
94720	Yes	Observation/Investigation Well	Piezometer	Observation	ALTA ENV #2140E	1983-01-26	NE	10	50	17	4	ALBERTA ENVIRONMENT/EARTH SCIENCES DIVISION	14.94
94722	Yes	Observation/Investigation Well	Piezometer	Observation	ALTA ENV #2141E	1983-01-26	NE	10	50	17	4	ALBERTA ENVIRONMENT/EARTH SCIENCES DIVISION	26.21
94724	Yes	Observation/Investigation Well	Piezometer	Observation	ALTA ENV #2138E	1983-01-31	NE	10	50	17	4	ALBERTA ENVIRONMENT/EARTH SCIENCES DIVISION	25.3
94719	Yes	Observation/Investigation Well	Test Hole	Other	ALTA ENV #2133E	1983-01-27	NE	10	50	17	4	ALBERTA ENVIRONMENT/EARTH SCIENCES DIVISION	4.57
94721	Yes	Observation/Investigation Well	Test Hole	Unknown	ALTA ENV #2137E	1983-01-26	NE	10	50	17	4	ALBERTA ENVIRONMENT/EARTH SCIENCES DIVISION	15.24
94723	Yes	Observation/Investigation Well	Test Hole	Unknown	ALTA ENV #2139E	1983-01-31	NE	10	50	17	4	ALBERTA ENVIRONMENT/EARTH SCIENCES DIVISION	14.63
94725	Yes	Observation/Investigation Well	Test Hole	Unknown	ALTA ENV #2136E	1983-01-28	NE	10	50	17	4	ALBERTA ENVIRONMENT/EARTH SCIENCES DIVISION	29.87
1888429	Yes	Observation/Investigation Well	Test Hole	Other	C. E. MODELL & ASSOC. LTD	2004-04-16	SE	10	50	17	4	HILL DRILLING LTD.	48.77
1888430	Yes	Observation/Investigation Well	Test Hole	Other	C. E. MOELLL & ASSOC. LLTD	2004-04-15	SE	10	50	17	4	HILL DRILLING LTD.	48.77
94707	Yes	Old > 1930 install	Federal Well Survey	Domestic & Stock	MAGNUSSEN	1930-01-01	9	8	50	17	4	UNKNOWN DRILLER	4.27
94713	Yes	Old > 1930 install	Federal Well Survey	Domestic	MASTERS, J.E.	1915-01-01	SE	10	50	17	4	UNKNOWN DRILLER	7.01
94715	Yes	Old > 1930 install	Federal Well Survey	Stock	MCDONAGH, W.N.	1919-01-01	14	10	50	17	4	UNKNOWN DRILLER	91.44
94716	Yes	Old > 1930 install	Federal Well Survey	Domestic	MCDONAGH, W.N.	1912-01-01	14	10	50	17	4	UNKNOWN DRILLER	6.1
94744	Yes	Old > 1930 install	Federal Well Survey	Stock	NICHOLS	1929-01-01	8	16	50	17	4	UNKNOWN DRILLER	123.44
94745	Yes	Old > 1930 install	Federal Well Survey	Unknown	NICHOLS	1920-01-01	SE	16	50	17	4	UNKNOWN DRILLER	7.62
94754	Yes	Old > 1930 install	Federal Well Survey	Domestic		1920-01-01	NE	15	50	17	4	UNKNOWN DRILLER	32.92
94708	Yes	Federal well survey	Federal Well Survey	Domestic & Stock			SE	8	50	17	4	UNKNOWN DRILLER	121.92
94746	Yes	Greater than 1.6 km	Federal Well Survey	Domestic & Stock	WESMONKE		12	16	50	17	4	UNKNOWN DRILLER	11.58
94607	Yes	Greater than 1.6 km	Chemistry	Domestic	PHILLIPS, Brent							UNKNOWN DRILLER	94.49
94741	Yes	Greater than 1.6 km	New Well	Domestic	WOOD, DENNIS	1980-04-29	NE	15	50	17	4	GLOBE DRLG	41.15
94742	Yes	Greater than 1.6 km	Chemistry	Domestic	WOOD, DENNIS W.		NE	15	50	17	4	UNKNOWN DRILLER	96.01
94743	Yes	Greater than 1.6 km	New Well	Domestic & Stock	OSLUND, ROGER	1975-08-05	NE	15	50	17	4	ED'S DRLG	93.88
94747	Yes	Greater than 1.6 km	New Well	Stock	WESTMANCOUT, BRIAN	1985-05-03	13	16	50	17	4	GORDON'S DRILLING LTD.	20.12

Note: Data based on Alberta Water Well Information Database search, September 11, 2023.

TETRA TECH

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LEGEND

- Well Record Requiring Further Verification
- Well Record Not Requiring Further Verification
- 1.6 km Search Area
- Site Outline

Base Data

- Road
- Watercourse
- Waterbody

NOTES
Base data source: Imagery provided by Google Earth; Airbus (2023)
Well records from Alberta Water Well Database (2023)
CanVec 1:50,000

STATUS
ISSUED FOR USE

2023 GROUNDWATER MONITORING PROGRAM RYLEY, ALBERTA

Water Well Database Search

PROJECTION	DATUM	CLIENT
UTM Zone 12	NAD83	CleanHarbors

Scale: 1:20,000
400 200 0 400
Metres

TETRA TECH

FILE NO.
SWOP04591-03_AppB2_WaterWellSearch.mxd

OFFICE	DWN	CKD	APVD	REV
Tt-VANC	DS	SL	CF	0

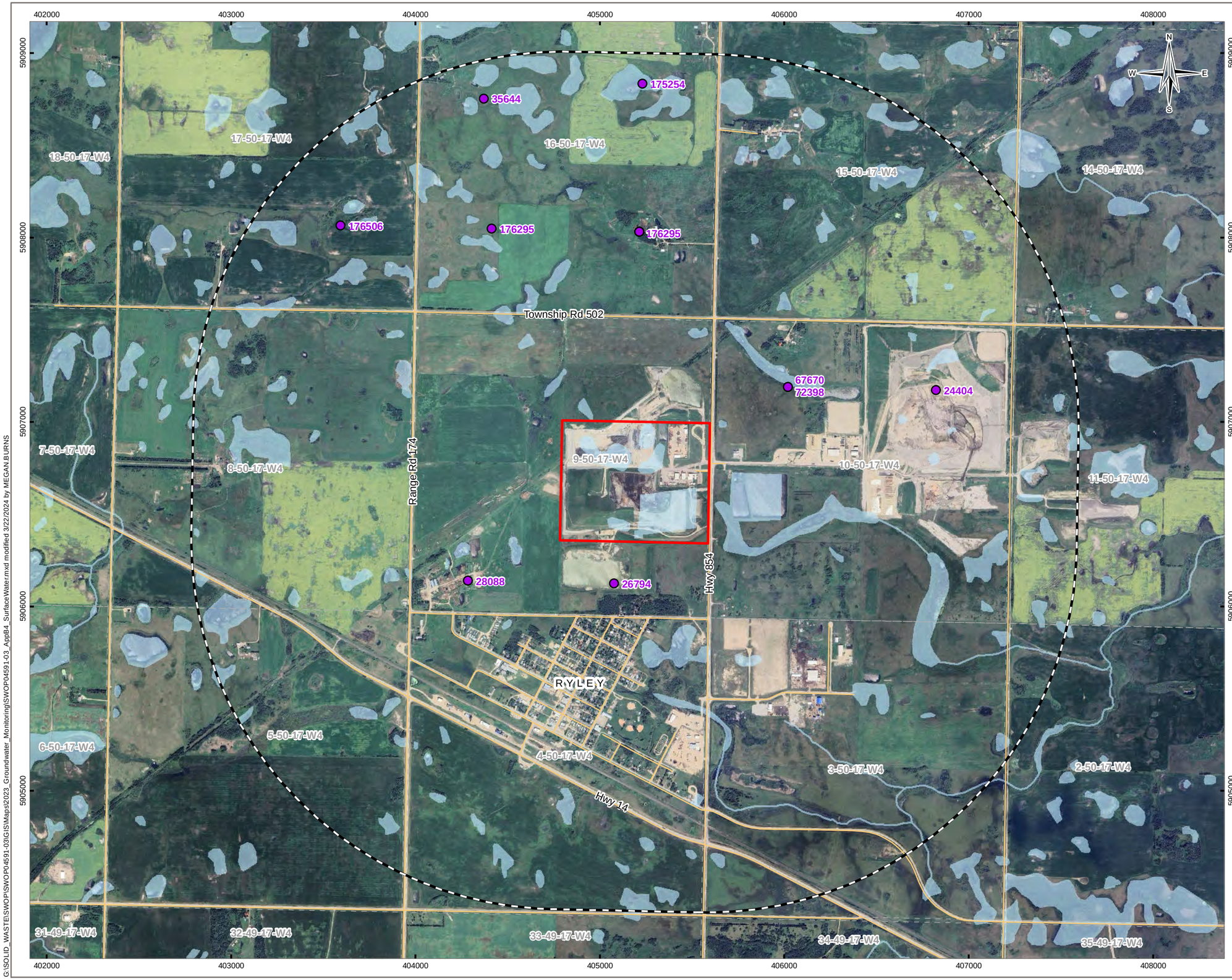
DATE	PROJECT NO.
March 22, 2024	SWM.SWOP04591-03

Appendix B-2

Appendix B-3: Surface Water Users

Priority	Licensee	Project	License Volume	Consumption Use	LSD	Classification	Sub Classification	Specific Classification	Diversion Type	Approval ID	Latitude	Longitude	Specific Purpose	Licenced Date
19981021002	CLAYSTONE WASTE LTD.	PARKS & RECREATION/CAMPGROUNDS	18,000	15,000	NW 10-050-17 W4M	COMMERCIAL	RECREATION	PARKS & RECREATION/CAMPGROUNDS	RTON	72398	53.30554	-112.41038	RCRTN	1998-10-21
19950303013	CLAYSTONE WASTE LTD.	WASTE DISPOSAL/REMEDIATION	9860	1230	NE 10-050-17 W4M	INDUSTRIAL	DOWNSTREAM OIL & GAS	WASTE DISPOSAL/REMEDIATION	DTR	24404	53.30554	-112.39834	OTHR	1996-08-30
19801231085	RUDY & GERTIE MIZERA	REGISTRATIONS/FARMSTEADS/OTHER FARM USE	285	285	NW 03-050-17 W4M	AGRICULTURE	TRADITIONAL USE	REGISTRATIONS/FARMSTEADS/OTHER FARM USE	DWB	143517	53.29107	-112.41031	REGISTRY	2002-01-28
19801231084	RUDY & GERTIE MIZERA	REGISTRATIONS/FARMSTEADS/OTHER FARM USE	285	285	NW 03-050-17 W4M	AGRICULTURE	TRADITIONAL USE	REGISTRATIONS/FARMSTEADS/OTHER FARM USE	DWB	143517	53.29107	-112.41031	REGISTRY	2002-01-28
19980417001	CLAYSTONE WASTE LTD.	WASTE DISPOSAL/REMEDIATION	57000	57000	NW 10-050-17 W4M	INDUSTRIAL	DOWNSTREAM OIL & GAS	WASTE DISPOSAL/REMEDIATION	RTON	67670	53.30554	-112.41038	SOTHER	1998-07-28
19910826001	LAIDLAW ENVIRONMENTAL SERVICES LTD.	FLOOD CONTROL OR DRAINAGE	0	0	SE 09-050-17 W4M	MANAGEMENT	WATER MANAGEMENT	FLOOD CONTROL OR DRAINAGE	DTR	26794	53.2958	-112.4242	FLOODCNT	1992-03-09
19881223001	STIER, PAT	STOCKWATERING	6160	4930	SW 09-050-17 W4M	AGRICULTURE	STOCKWATERING	STOCKWATERING	DTR	28088	53.2958	-112.4361	STCKWT	1991-09-30
19901231807	LYONS, BRIAN	REGISTRATIONS/FARMSTEADS/OTHER FARM USE	56	56	SW 16-050-17 W4M	AGRICULTURE	TRADITIONAL USE	REGISTRATIONS/FARMSTEADS/OTHER FARM USE	DWB	176295	53.31297	-112.43475	REGISTRY	2002-03-28
19901231806	LYONS, BRIAN	REGISTRATIONS/FARMSTEADS/OTHER FARM USE	279	279	SE 16-050-17 W4M	AGRICULTURE	TRADITIONAL USE	REGISTRATIONS/FARMSTEADS/OTHER FARM USE	DWB	176295	53.31296	-112.42273	REGISTRY	2002-03-28
19701231829	LYONS, BRIAN	REGISTRATIONS/FARMSTEADS/OTHER FARM USE	28	28	SW 16-050-17 W4M	AGRICULTURE	TRADITIONAL USE	REGISTRATIONS/FARMSTEADS/OTHER FARM USE	DWB	176295	53.31297	-112.43475	REGISTRY	2002-03-28
19601231913	LYONS, BRIAN	REGISTRATIONS/FARMSTEADS/OTHER FARM USE	28	28	SE 16-050-17 W4M	AGRICULTURE	TRADITIONAL USE	REGISTRATIONS/FARMSTEADS/OTHER FARM USE	DWB	176295	53.31296	-112.42273	REGISTRY	2002-03-28
19601231912	LYONS, BRIAN	REGISTRATIONS/FARMSTEADS/OTHER FARM USE	419	419	SE 16-050-17 W4M	AGRICULTURE	TRADITIONAL USE	REGISTRATIONS/FARMSTEADS/OTHER FARM USE	DWB	176295	53.31296	-112.42273	REGISTRY	2002-03-28
19901231805	LYONS, BRIAN	REGISTRATIONS/FARMSTEADS/OTHER FARM USE	419	419	SE 16-050-17 W4M	AGRICULTURE	TRADITIONAL USE	REGISTRATIONS/FARMSTEADS/OTHER FARM USE	DWB	176295	53.31296	-112.42273	REGISTRY	2002-03-28
Notes:			**92819 (m^3/year)**	**79959 (m^3/year)**										

Active Surface Water Licences and Authorizations within 2.0 km of SE 9-50-17-W4M as of March 12, 2024.



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LEGEND

- Surface Water User (Approval ID)
- 2 km Search Area
- Site Outline

Base Data

- Road
- Watercourse
- Waterbody

NOTES

Base data source: Imagery provided by Google Earth; Airbus (2023)
Surface water users from Alberta Flow Estimation Tool for Ungauged Watersheds, Accessed March 13, 2024
Water wells from Alberta Water Well Information Database, February 2024
CanVec 1:50,000

STATUS
ISSUED FOR USE

2023 GROUNDWATER MONITORING PROGRAM RYLEY, ALBERTA

Surface Water Users 2 km Search Radius

PROJECTION	DATUM	CLIENT
UTM Zone 12	NAD83	CleanHarbors

Scale: 1:20,000
400 200 0 400
Metres

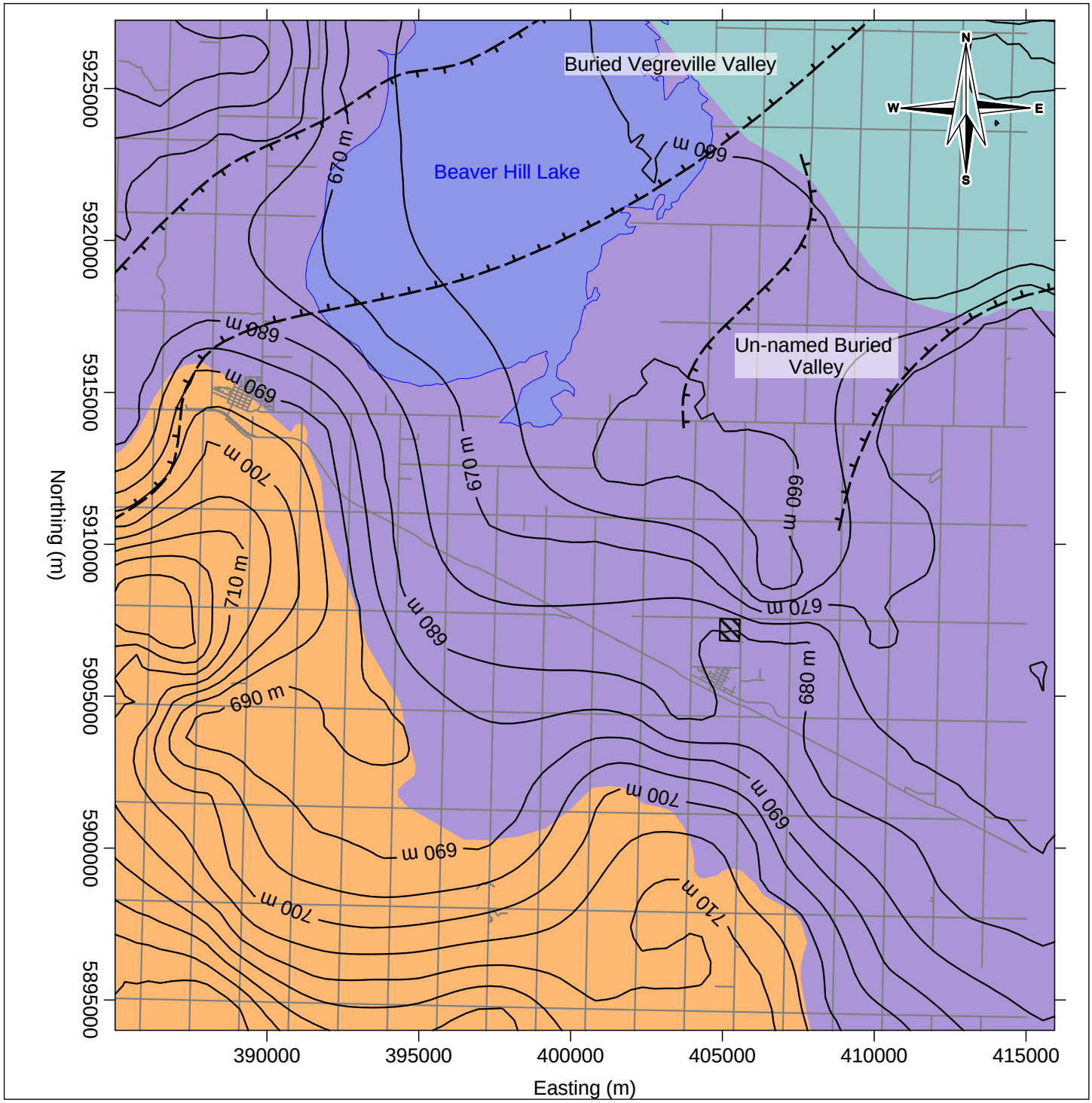
TETRA TECH

FILE NO. SWOP04591-03_AppB4_SurfaceWater.mxd

OFFICE	DWN	CKD	APVD	REV
Tt-VANC	MRB	SL	WW	0

DATE	PROJECT NO.
March 22, 2024	SWM.SWOP04591-03

Appendix B-4



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

2023 GROUNDWATER MONITORING PROGRAM, RYLEY, ALBERTA

Regional Geology

PROJECTION	DATUM	CLIENT
UTM Zone 12	NAD83	CleanHarbors

0 2 4 6
Kilometres

FILE NO.
SWOP04591-03_AppB5_RegionalGeology.srf

PROJECT NO.	DWN	CKD	APVD	REV
SWM.SWOP04591-03	CF	BS	AS	0

OFFICE	DATE
Tt-CAL	March 22, 2024

TETRA TECH

Appendix B-5

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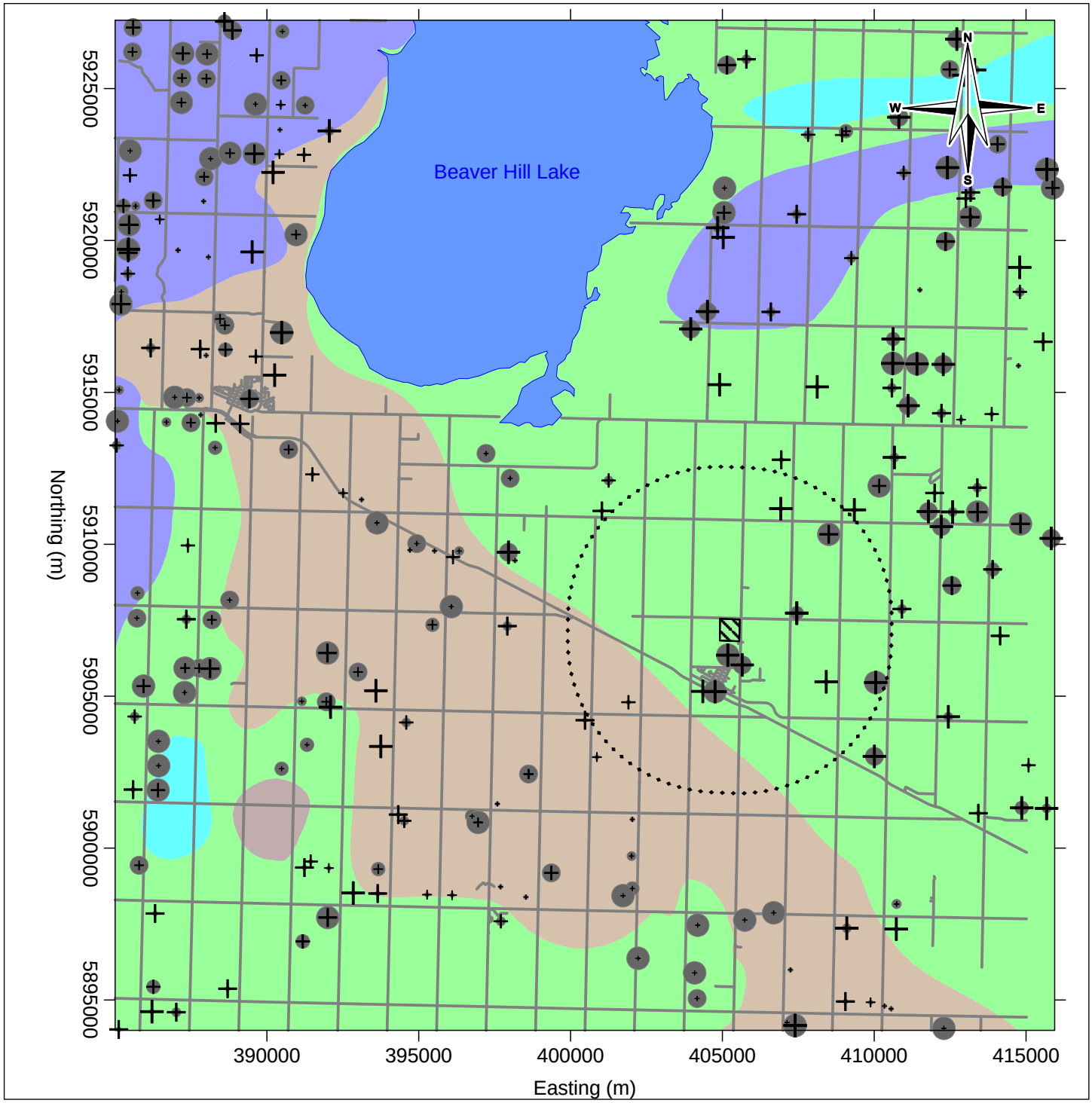

LEGEND

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

2023 GROUNDWATER MONITORING PROGRAM, RYLEY, ALBERTA

Regional Hydrogeology Water Wells

PROJECTION	DATUM	CLIENT
UTM Zone 12	NAD83	CleanHarbors

0 2 4 6
Kilometres

FILE NO.
SWOP04591-03_AppB6_RegionalHydrogeology.srf

PROJECT NO.	DWN	CKD	APVD	REV
SWM.SWOP04591-03	CF	BS	AS	0

OFFICE	DATE
Tt-CAL	March 22, 2024

TETRA TECH

Appendix B-6

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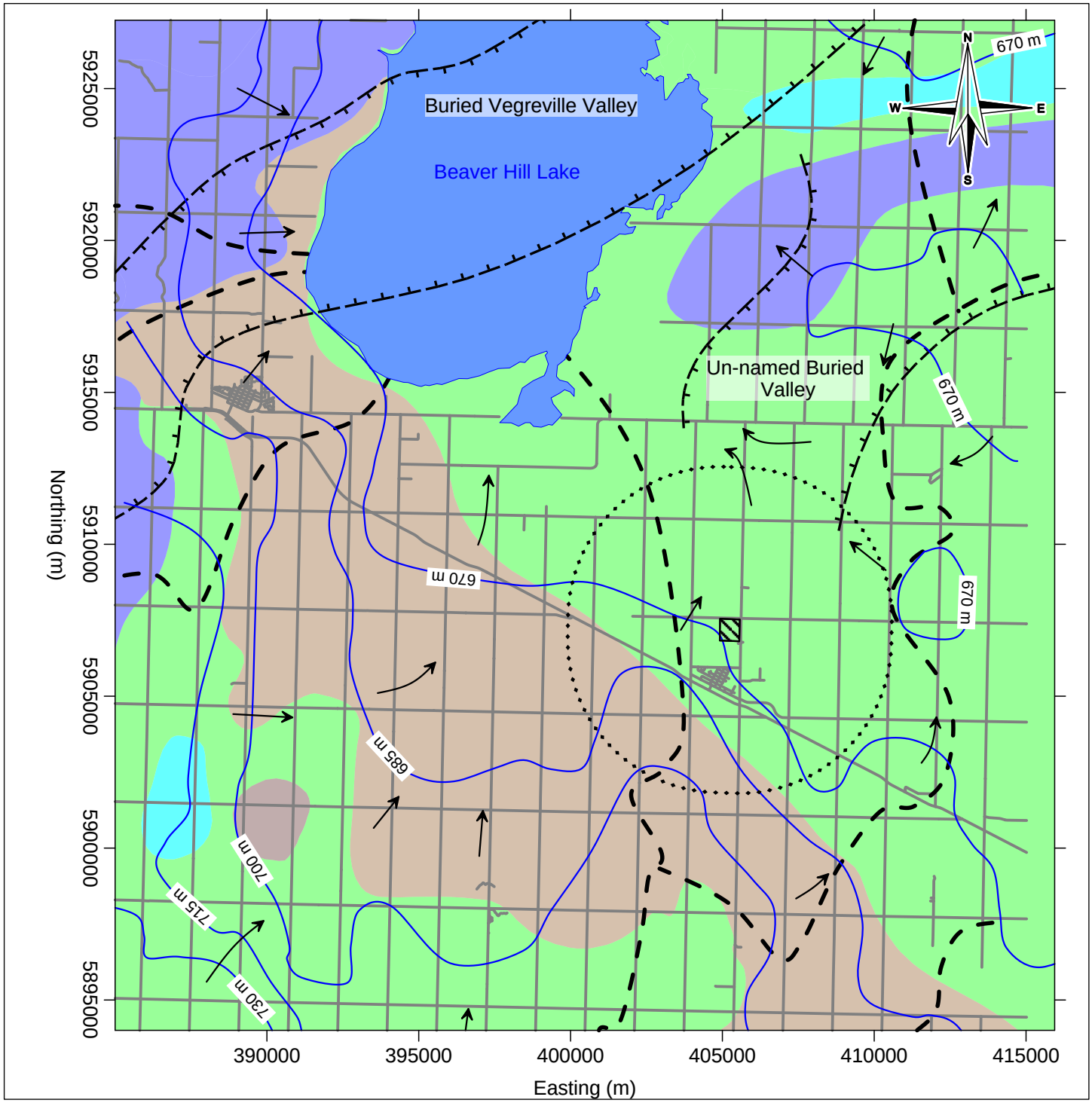

LEGEND

- 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

2023 GROUNDWATER MONITORING PROGRAM, RYLEY, ALBERTA

Regional Hydrogeology Groundwater Flow

PROJECTION	DATUM	CLIENT
UTM Zone 12	NAD83	CleanHarbors

0 2 4 6
Kilometres

FILE NO.
SWOP04591-03_AppB7_RegionalHydrogeology.srf

PROJECT NO.	DWN	CKD	APVD	REV
SWM.SWOP04591-03	CF	BS	AS	0

OFFICE	DATE
Tt-CAL	March 22, 2024

TETRA TECH

Appendix B-7

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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	1	2	3	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						
	CLAY - some silt and fine grained sand, bentonitic, moist, very soft						682.0
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							

Archive

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

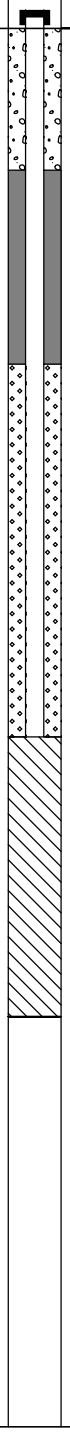
Archive

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 -	688.0
1	GARBAGE		bentonite -	687.0
2	CLAY (FILL)			
	GARBAGE		slotted section -	686.0
3	CLAY (FILL)		sand filter -	
	GARBAGE			685.0
4	CLAY (TILL) - silty, sandy, gravel sizes, clay shale nodules, sandstone pockets, stiff, medium plastic, brown		random backfill -	684.0
5				
	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
6				
				682.0
7				
7.5				



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TETRA TECH EBA

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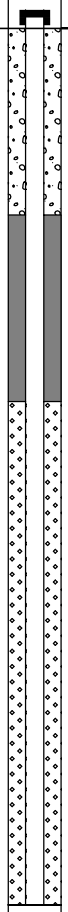
REVIEWED BY: RJM	COMPLETE: 92/11/13
DRAWING NO: 11099-03	Page 1 of 1

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	1	2	3	Elevation (m)
0	CLAY (FILL)		grout -				688.0
	GARBAGE						
1			bentonite -				687.0
2							686.0
	CLAY (FILL)						
3			slotted section -				685.0
	GARBAGE		sand filter -				
4							684.0
	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						
5							683.0
6							682.0
7							681.0
7.5							



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	REVIEWED BY: RJM	COMPLETE: 92/11/13
	DRAWING NO: 11099-04	Page 1 of 1

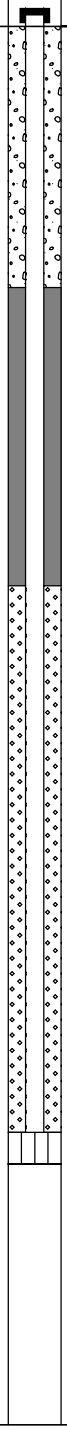
Archive

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			slotted section - sand filter -	684.0
5				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				



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TETRA TECH EBA

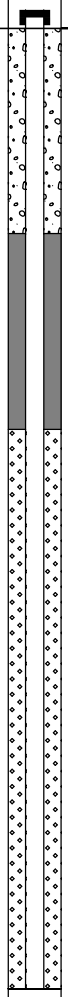
LOGGED BY: RJM	COMPLETION DEPTH: 6.1 m
REVIEWED BY: RJM	COMPLETE: 92/11/13
DRAWING NO: 11099-05	Page 1 of 1

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	1	2	3	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						
	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						679.0
6							678.0
7							
7.5							677.0



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TETRA TECH EBA

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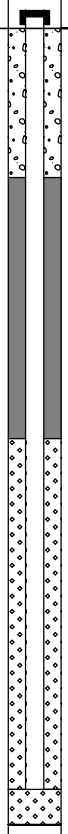
REVIEWED BY: RJM	COMPLETE: 92/11/13
DRAWING NO: 11099-06	Page 1 of 1

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)			
	CLAY (TILL) - silty, sandy, occasional gravel sizes, low plastic, brown, frozen		grout -	685.0
	- 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) slough - none at 0 hrs. water - dry at 0 hrs. - dry at 6 hrs. - 3.26 metres at 11 days Well installed to 4.1 metres			681.0
5				680.0
6				679.0
7				
7.5				



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TETRA TECH EBA

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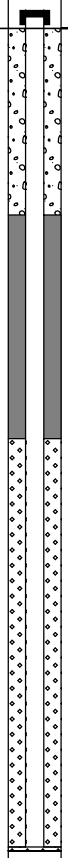
REVIEWED BY: RJM	COMPLETE: 92/11/27
DRAWING NO: 11099-08	Page 1 of 1

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)			
	CLAY (TILL) - silty, sandy, occasional gravel sizes, brown, frozen - end of frost		grout -	685.0
1			bentonite -	684.0
2	CLAY SHALE - silty, reworked, very stiff, high plastic, brown to grey			683.0
3	SANDSTONE AND CLAY SHALE - interbedded, sandstone - silty, clayey, dense, grey, clay shale - silty, very stiff, high plastic, grey/brown		slotted section - sand filter -	
	SANDSTONE - silty, clayey, medium to coarse grained, damp, dense, grey			682.0
4				
	END OF BOREHOLE (4.4 metres) slough - none at 0 hrs. water - dry at 0 hrs. - dry at 5 days - 3.33 metres at 11 days Well installed to 4.4 metres			681.0
5				
				680.0
6				
				679.0
7				
7.5				



Archive

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	1	2	3	Elevation (m)
0	TOPSOIL - (25mm thick)						
	CLAY - sandy, silty, white salt deposits, rust specks, dessicated, brown, frozen		grout -				
	- end of frost						
	CLAY (TILL) - silty, sandy, gravel sizes, coal pockets, clay shale and sandstone nodules, damp, stiff, medium plastic, brown		bentonite -				
1							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 Well installed to 3.1 metres						
5							679.0
6							678.0
7							677.0
7.5							

Archive

TETRA TECH EBA

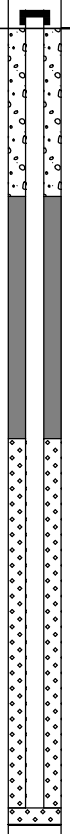
LOGGED BY: RJM	COMPLETION DEPTH: 4.26 m
REVIEWED BY: RJM	COMPLETE: 92/11/27
DRAWING NO: 11099-10	Page 1 of 1

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)			
	CLAY - silty, sandy, white salt stains, dessicated, brown		grout -	
	CLAY (TILL) - silty, sandy, gravel sizes, moist, low plastic, brown			683.0
1	CLAY SHALE - silty, plated, very stiff, brown		bentonite -	682.0
2			slotted section -	681.0
3	- blocky, high plastic, grey		sand filter -	680.0
4	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			679.0
5				678.0
6				677.0
7				
7.5				



Archive

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	1	2	3	Elevation (m)
0	TOPSOIL - organic silt, sandy, frozen, (50mm thick)						684.0
	CLAY - sandy, silt, white salt stains, rust specks, dessicated, brown		grout -				
	CLAY (TILL) - silty, sandy, gravel sizes, stiff to very stiff, low plastic						
1							683.0
	SANDSTONE - silty, clayey, clay shale stringers, oxidized, weathered, medium to coarse grained, brown		bentonite -				
2	- grey						682.0
			slotted section -				
3	CLAY SHALE - silty, friable, damp, hard, high plastic, brown		sand filter -				681.0
	- grey/brown						
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							

Archive

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	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	Elevation (m)
0	TOPSOIL - clayey, silty, organic, peaty, black							
	CLAY (TILL) - silty, sandy, occasional gravel, damp, stiff to very stiff, low to medium plastic, medium brown							686.0
1			A1					
	SANDSTONE (BEDROCK) - silty, fine grained, homogeneous, damp, poorly cemented, very low strength, green grey, pale grey speckling, glauconitic, interbedded with shale horizons							
								685.0
	- clay shale horizons - silty, medium to high plastic, dark grey							
2								
			A2					
	END OF BOREHOLE (2.4 metres) Notes: Stopped due to auger refusal (cemented sandstone band) Permanent Monitoring well installed to 2.4 metres							684.0
3								
								683.0
4								
								682.0
5								
								681.0
6								
								680.0
7								
7.5								

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	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	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
	- clay shale inclusions - grey to brown						
4							682.0
5 ▼ 0 hrs.							▼ 0 hrs.
	END OF BOREHOLE (5.4 metres) water - 5.0 metres at 0 hrs. Monitoring well installed to 5.4 metres						681.0
6							680.0
7							
7.5							

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	
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			687.0
2	- moist, stiff			686.0
3	CLAY SHALE - silty, some sand, friable, damp, soft, low to medium plastic, dark grey			685.0
4	SANDSTONE - some silt and clay, fine to medium grained, friable, uncemented, blue green grey - clay shale interbeds			684.0
5				683.0
6	CLAY SHALE - sandstone interbeds			682.0
7	- 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

Archive

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
	CLAY - silty, sandy, some salt inclusions, pebbles, coal pockets, oxide stains, very fine grained sand, damp, stiff, medium plastic, grey brown			
1				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			
	CLAY SHALE - silty, some sand, damp, hard, high plastic, green grey with dark blue pockets			681.0
7	SILTSTONE - pebbles, strongly cemented, dry, hard, light grey			
	CLAY SHALE - silty, some sand, damp, hard, high plastic, green grey with dark blue pockets			680.0
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				

Archive

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
	CLAY (TILL) - silty, some sand, salt pockets, oxide stains, damp, very stiff, medium plastic, brown			
1				686.0
	- sand lense - silty, clay, fine to medium grained, firm, medium plastic, mottled brown grey			
2				685.0
	- some pebbles, coal pockets, moist, stiff, green brown			
	CLAY SHALE - silty, dry to damp, hard, high plastic, dark grey			
3				684.0
4				683.0
	SANDSTONE - silty, some clay, fine to medium grained, friable, uncemented, damp, soft, low plastic, blue green grey			
5	- siltstone layer - strongly cemented, hard, light grey, (100mm thick)			682.0
	- sandier			
6	SILTSTONE - strongly cemented, hard, light grey			681.0
	CLAY SHALE - silty, some sand, glauconitic sand layers, damp to moist, hard, medium plastic, blue green grey to brown grey			
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				

Archive

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 sandstone - silty, glauconitic, fine to medium grained, friable, uncemented, damp, blue green grey			684.0
4	SANDSTONE - with clay shale seams			683.0
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				679.0
	- no visible sandstone seams			
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				

Archive

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	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			684.0
4	SANDSTONE - with clay shale seams			683.0
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				

Archive

TETRA TECH EBA

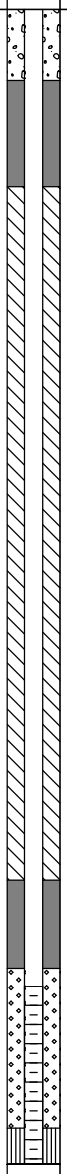
LOGGED BY: SP	COMPLETION DEPTH: 5.33 m
REVIEWED BY: SP	COMPLETE: 96/10/01
DRAWING NO: 12416-06	Page 1 of 1

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				



Archive

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	1	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					

Archive

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	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	SANDSTONE - with 25mm thick clay shale layers			683.0
7				682.0
8	SILTSTONE - clayey, very fine grained, cemented, dry, hard, light grey			681.0
	CLAY SHALE AND SANDSTONE - interbedded			
	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

Archive

TETRA TECH EBA

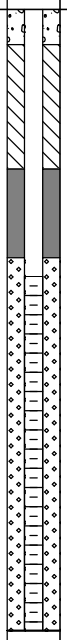
LOGGED BY: SP	COMPLETION DEPTH: 9.9 m
REVIEWED BY: SP	COMPLETE: 96/10/01
DRAWING NO: 12416-09	Page 1 of 1

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	
	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	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

Archive

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			687.0
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, damp to moist, olive blue			685.0
3	- dry to moist, blue green			
				684.0
	- free water			
4				
				683.0
5	SILTSTONE - very fine grained, cemented, dry, hard, light grey			
	- 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			
				679.0
9				
				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				

Archive

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	2	3	Elevation (m)
0	TOPSOIL - silty, sandy, organics, rootlets, dark brown, (50mm thick)		Pipe stickup = 1.04 metres			
	SILT AND CLAY - abundant salt deposits, friable, dry, loose, light brown					687.0
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, damp to moist, olive blue					685.0
3	- dry to moist, blue green					684.0
4	- free water					683.0
5	SILTSTONE - very fine grained, cemented, dry, hard, light grey - trace of fine gravel to 5mm diameter					682.0
	END OF BOREHOLE (5.0 metres) slough - none at 0 hrs. water - dry at 0 hrs. Monitoring well installed to 4.9 metres					
6						681.0
7						680.0
8						679.0
9						678.0
10						677.0
11						676.0
12						

Archive

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
	SANDSTONE - some clay, trace of pebbles, medium grained, uncemented, damp to moist, brown			
3	- oxide stains, very moist - interbedded clay seams, silty, brown nodules, olive green			685.0
4	- 50mm angular rock			684.0
	CLAY SHALE - trace of very hard siltstone, friable, cemented, dry to damp, hard, medium plastic, grey			
5	- trace of sand, medium grained			683.0
6				682.0
7	- brown nodules			681.0
8				680.0
	CLAY SHALE AND SANDSTONE - interbedded, medium grained, damp to moist, hard, low to medium plastic, grey mottled brown			
9	SILTSTONE - trace of gravel to 5mm diameter, cemented, dry, very hard, light grey			679.0
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

Archive

TETRA TECH EBA

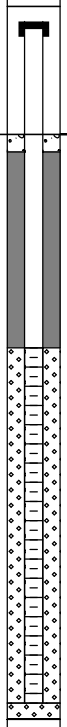
LOGGED BY: JSF	COMPLETION DEPTH: 10.05 m
REVIEWED BY: RJM	COMPLETE: 98/10/01
DRAWING NO: 12892-03	Page 1 of 1

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	2	3	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
	SANDSTONE - some clay, trace of pebbles, medium grained, uncemented, damp to moist, brown					
3	- oxide stains, very moist - interbedded clay seams, silty, brown nodules, olive green					685.0
4	- 50mm angular rock					684.0
	CLAY SHALE - trace of very hard siltstone, friable, cemented, dry to damp, hard, medium plastic, grey					683.0
5	END OF BOREHOLE (5.0 metres) slough - none at 0 hrs. water - dry at 0 hrs. Monitoring well installed to 4.9 metres					
6						682.0
7						681.0
8						680.0
9						679.0
10						678.0
11						677.0
12						676.0



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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				

Archive

TETRA TECH EBA

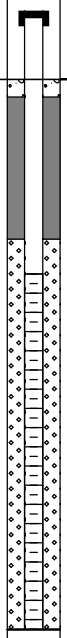
LOGGED BY: JSF	COMPLETION DEPTH: 9.9 m
REVIEWED BY: RJM	COMPLETE: 98/10/01
DRAWING NO: 12892-05	Page 1 of 1

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				



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TETRA TECH EBA

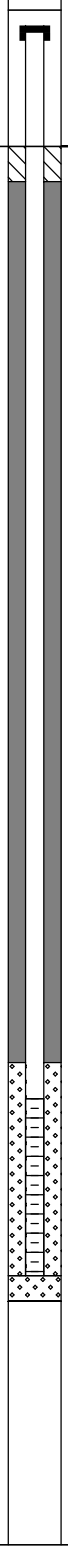
LOGGED BY: JSF	COMPLETION DEPTH: 4.72 m
REVIEWED BY: RJM	COMPLETE: 98/10/01
DRAWING NO: 12892-06	Page 1 of 1

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	2	3	Elevation (m)
0	GRAVEL (FILL)		Pipe stickup = 1.04 metres			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	SANDSTONE - silty, very moist, loose, blue grey					682.0
7						681.0
8	SILTSTONE - cemented, loose, light brown grey SANDSTONE - trace of clay shale					680.0
9						679.0
10	END OF BOREHOLE (9.91 metres) slough - none at 0 hrs. water - dry at 0 hrs. Monitoring well installed to 9.69m					678.0
11						677.0
12						



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TETRA TECH EBA

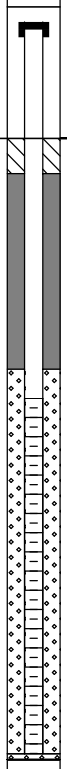
LOGGED BY: DM	COMPLETION DEPTH: 9.91 m
REVIEWED BY: PRM	COMPLETE: 04/08/13
DRAWING NO: 5100812-01	Page 1 of 1

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	2	3	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						



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TETRA TECH EBA

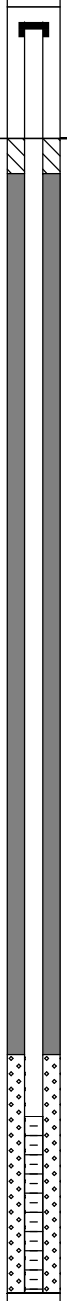
LOGGED BY: DM	COMPLETION DEPTH: 5.33 m
REVIEWED BY: PRM	COMPLETE: 04/08/13
DRAWING NO: 5100812-02	Page 1 of 1

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				



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TETRA TECH EBA

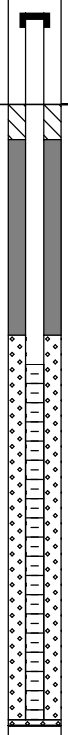
LOGGED BY: DM	COMPLETION DEPTH: 9.91 m
REVIEWED BY: PRM	COMPLETE: 04/08/13
DRAWING NO: 5100812-03	Page 1 of 1

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	
	CLAY SHALE - silty, hard, loose, brown			686.0
1				
	SANDSTONE - silty, moist, loose, blue grey			685.0
2				
	- wet			684.0
3				
				683.0
4	CLAY SHALE - moist, loose, brown			
				682.0
5				
	END OF BOREHOLE (5.33 metres) slough - none at 0 hrs. water - dry at 0 hrs. Monitoring well installed to 5.28m			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: DM	COMPLETION DEPTH: 5.33 m
	REVIEWED BY: PRM	COMPLETE: 04/08/13
	DRAWING NO: 5100812-04	Page 1 of 1

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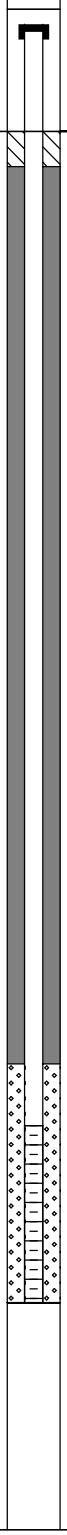
WELL INSTALLATION	CLEAN HARBORS INC.	BOREHOLE NO: 26A
	DRILL: SOLID STEM AUGER	PROJECT: 5100812.001
RYLEY, ALBERTA		ELEVATION: 686.7 m

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				677.0
11	END OF BOREHOLE (9.91 metres) slough - none at 0 hrs. water - dry at 0 hrs. Monitoring well installed to 10.05m			676.0
12				675.0



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TETRA TECH EBA

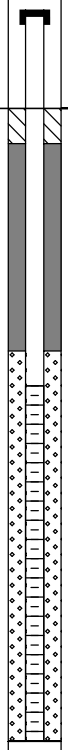
LOGGED BY: DM	COMPLETION DEPTH: 9.91 m
REVIEWED BY: PRM	COMPLETE: 04/08/13
DRAWING NO: 5100812-05	Page 1 of 1

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	2	3	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



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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
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

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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
	- wet, interbedded with siltstone - cemented, dry, hard, grey to light brown			
3				684.0
4				683.0
	SILTSTONE - cemented, dry, hard, grey to light brown			
5				682.0
6				681.0
0 hrs.	END OF BOREHOLE (6.65 metres) water - 6.61 metres at 0 hrs. Monitoring well installed to 6.65 metres			0 hrs.
7				680.0
8				679.0
9				678.0
10				677.0
11				676.0
12				

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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
3	CLAY SHALE - moist, hard, low plastic, grey, trace of white precipitates			10
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

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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)			
	CLAY - some sand, moist, hard, medium plastic, black, some coal, silt inclusions			
1	- silty, brown, iron and silt inclusions			5
2	SAND - coarse grained, wet, soft, green grey			
3	- hard			10
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. Monitoring well installed to 10.00 metres			35
11				
12				39

Archive

TETRA TECH EBA

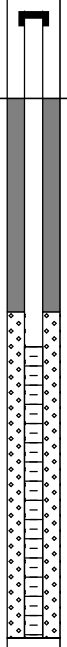
LOGGED BY: MC	COMPLETION DEPTH: 10 m
REVIEWED BY: MH	COMPLETE: 12/10/04
DRAWING NO: 22103058-01	Page 1 of 1

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)			
	CLAY - some sand, moist, hard, medium plastic, black, some coal, white silt inclusions			
1	- silty, brown, iron, silt and coal inclusions			5
2	SAND - some silt, coarse grained, wet, green blue, some silt inclusions			
3 (0 hrs.)				10 (0 hrs.)
4				15
	END OF BOREHOLE (4.50 metres) water - 2.76 metres at 0 hrs. Monitoring well installed to 4.63 metres			
5				
6				20
7				25
8				
9				30
10				35
11				
12				39



Archive

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			
	SILTSTONE - cemented, dry, extremely weak, grey			
3				10
4	SAND - coarse grained, wet, hard, blue green, some clay pockets, silt inclusions			15
5	- silty, dry, grey, silty inclusions			
6	SILTSTONE - fine grained, moist, extremely weak, grey blue to light brown, silty inclusions			20
7				25
8				
9				30
10 (15 min.)	- dry, grey			15 min.
	END OF BOREHOLE (10.50 metres) water - 9.84 metres at 15 minutes Monitoring well installed to 10.86 metres			35
11				
12				39

Archive

TETRA TECH EBA

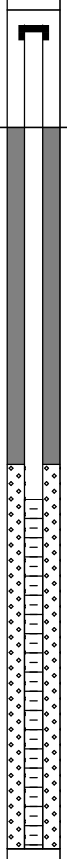
LOGGED BY: MC	COMPLETION DEPTH: 10.5 m
REVIEWED BY: MH	COMPLETE: 12/10/04
DRAWING NO: 22103058-03	Page 1 of 1

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			
4				15
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				35
11				
12				39



Archive

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
	SAND (TILL) - fine grained, moist, loose, dark brown			
	- reddish brown			
1	CLAY (TILL) - sandy, moist, firm, brown, silt, iron and coal inclusions			5
2	- dry, reddish brown, white precipitates			
	SAND - medium grained, moist, firm, brown, iron and white precipitates throughout			
3				10
4	- bluish grey, clay seams throughout			15
5	SANDSTONE - medium grained, very firm, grey, dark grey mottles throughout			
6				20
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
	SAND (TILL) - fine grained, moist, loose, dark brown			
	- reddish brown			
1	CLAY (TILL) - sandy, moist, firm, brown, silt, iron and coal inclusions			5
2	- dry, reddish brown, white precipitates			
	SAND - medium grained, moist, firm, brown, iron and white precipitates throughout			
3				10
4	- bluish grey, clay seams throughout			15
	END OF BOREHOLE (4.50 metres)			
5	water - 3.89 metres at 0 hrs.			
	Monitoring well installed to 4.64 metres			
	Note: 1 m east of MW29A			
	- sandstone			
6				20
7				25
8				
9				30
10				35
11				
12				40
13				45
14				
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			15
5	SANDSTONE - dry, extremely weak, light grey			
6	- medium grained, moist, dark grey			20
7				25
8	- light brown - dry, dark grey			
9	END OF BOREHOLE (9.00 metres) water - dry at 0 hrs. Monitoring well installed to 8.17 metres			30
10				35
11				
12				40
13				45
14				
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			
3	- iron inclusions			10
4	- greyish blue, brown mottles			15
5	END OF BOREHOLE (4.50 metres) water - dry at 0 hrs. Monitoring well installed to 4.67 metres Note: 1 m east of MW30A			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: 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			
3				10
4	- 200 mm thick sandstone layer - dry, light brown - moist, dark grey, light grey and brown silt, shale and sand			
5				15
6				20
7	- bluish grey, dark brown inclusions - dark grey			
8				25
9	END OF BOREHOLE (9.00 metres) water - dry at 0 hrs. Monitoring well installed to 9.02 metres			30
10				
11				35
12				40
13				
14				45
15				49

TETRA TECH EBA

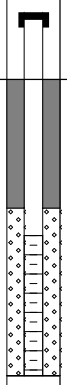
LOGGED BY: MC	COMPLETION DEPTH: 9 m
REVIEWED BY: TD	COMPLETE: 14/10/08
DRAWING NO:	Page 1 of 1

2014 GROUNDWATER WELLS INSTALLATION	CLEAN HARBORS	PROJECT NO. - BOREHOLE NO.
CLASS 1 WASTE MANAGEMENT FACILITY	DRILL: SOLID STEM AUGER	ENVSWM03472-01-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			
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			10
4				15
5				20
6				25
7				30
8				35
9				40
10				45
11				49
12				
13				
14				
15				



TETRA TECH EBA

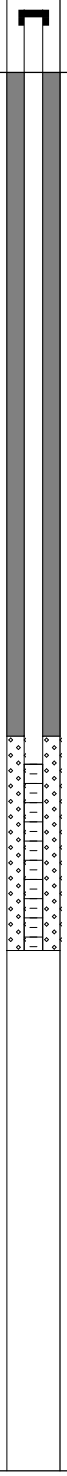
LOGGED BY: MC	COMPLETION DEPTH: 3 m
REVIEWED BY: TD	COMPLETE: 14/10/08
DRAWING NO:	Page 1 of 1

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			
3	- loose, bluish grey			10
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			30
	END OF BOREHOLE (9.00 metres) water - 8.04 metres at 0 hrs. Monitoring well installed to 9.42 metres			
10				
11				35
12				40
13				
14				45
15				49



TETRA TECH EBA

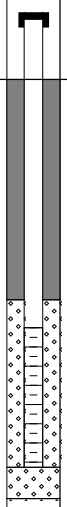
LOGGED BY: MC	COMPLETION DEPTH: 9 m
REVIEWED BY: TD	COMPLETE: 14/10/08
DRAWING NO:	Page 1 of 1

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			
	CLAY (TILL) - sandy, moist, firm, medium plastic, dark grey			
3	- loose, bluish grey			10
4	SAND - medium grained, dry, light grey - grey, iron inclusions			15
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			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: 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
	CLAY (TILL) - gravelly, some sand, subangular blocky, firm, medium plastic, dark grey, silt inclusions			
1	- massive, moist, very firm, high plastic, dark brown, coal, silt and iron inclusions			5
	SAND - coarse grained, moist, loose, dark brown, iron inclusions			
2	- mottles			
	- coarse grained, grey blue			
3	- 200 mm thick clay layer			10
	- siltstone			
	- saturated, silt mottled throughout			
4	SANDSTONE - fine grained, moist, grey blue, silt inclusions throughout			15
5				
	- siltstone			
6	- saturated, water seam			20
	- grey, dark grey mottles			
7	- moist			25
8				
	- saturated, grey			
9	- medium grained, moist			30
	- wet			
10	- wet seam			35
11				
12				40
13	- fractured bedrock, saturated, light grey			
	END OF BOREHOLE (13.50 metres)			45
14	water - 6.10 metres at 0 hrs.			
	Monitoring well installed to 13.90 metres			
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
	CLAY (TILL) - gravelly, some sand, subangular blocky, firm, medium plastic, dark grey, silt inclusions			
1	- massive, moist, very firm, high plastic, dark brown, coal, silt and iron inclusions			5
	SAND - coarse grained, moist, loose, dark brown, iron inclusions			
2	- mottles - coarse grained, grey blue			10
3	- 200 mm thick clay layer - siltstone - silt mottled throughout			
4	SANDSTONE - fine grained, moist, grey blue, silt inclusions throughout			15
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			20
6				
7				25
8				
9				30
10				
11				35
12				40
13				
14				45
15				49

TETRA TECH EBA

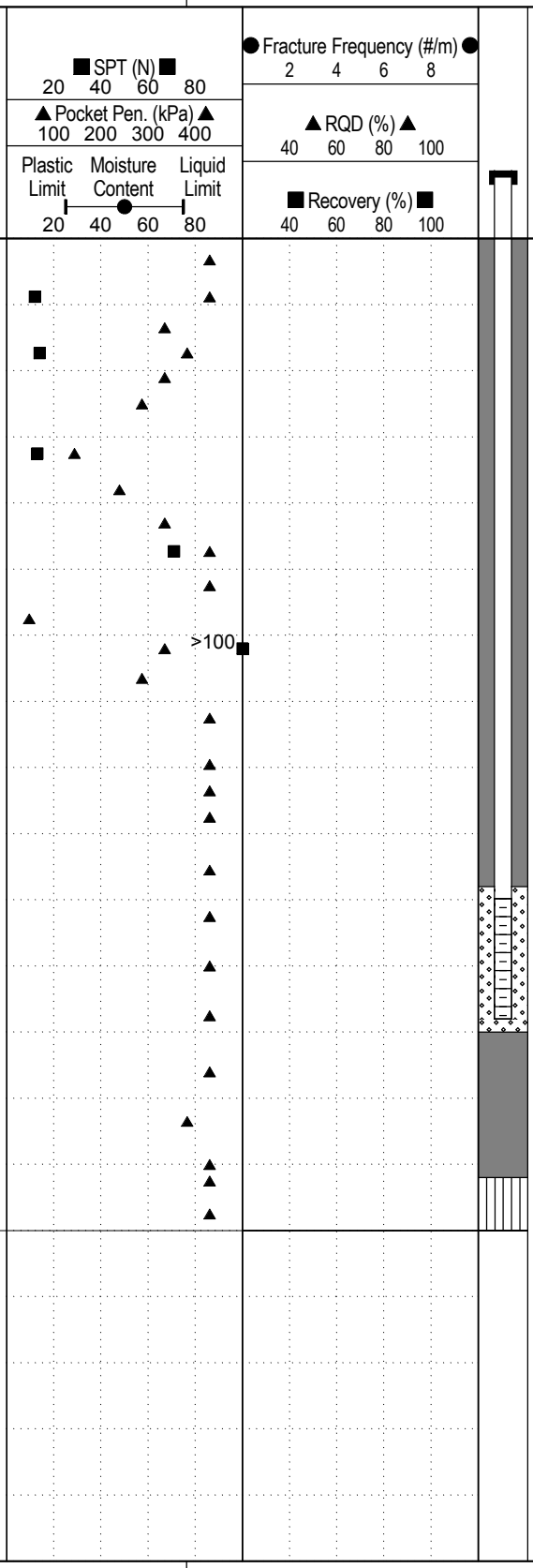
LOGGED BY: MC	COMPLETION DEPTH: 4.5 m
REVIEWED BY: TD	COMPLETE: 14/10/06
DRAWING NO:	Page 1 of 1

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 (%)
0	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	
1		CLAY (TILL) - some silt, trace of gravel, damp, firm, medium plastic, brown, coal and iron stained inclusions		14	
2		- some fine grained brown sand, low plastic, grey blue			
3		- silty, soft, medium to high plastic, brown		13	
4		- firm - silty, firm to very stiff, grey			
5		SANDSTONE - silty, clayey, fine to medium grained, damp to moist, extremely weak, grey		71	
6		- some silt, some clay, moist to wet - wet, grey blue		98 /225mm	
7		- silty, clayey, moist to wet, grey			
8		CLAY SHALE - trace of fine grained sand, trace of fine gravel, damp, extremely weak, high plastic, grey			
9					
10					
11					
12		- dark greyish brown - some fine grained sand, light grey			
13					
14		- no visible sand, dark grey			
15		END OF BOREHOLE (15.00 metres) slough - 14.25 metres Monitoring well installed to 11.80 metres			
16					
17					
18					
19					
20					



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: 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 (%)
0	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		
1		CLAY (TILL) - some silt, trace of gravel, damp, firm, medium plastic, brown, coal and iron stained inclusions		
2				
3		- gleying - sand pockets - fine grained sand, damp, very slight gleying - soft, low to medium plastic		
4		- silty, some fine grained brown sand, medium to high plastic, - firm to very stiff, grey		
5		SANDSTONE - silty, clayey, fine to medium grained, damp to moist, grey		
6 (0 hrs.)		END OF BOREHOLE (5.00 metres) Monitoring well installed to 4.80 metres		
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
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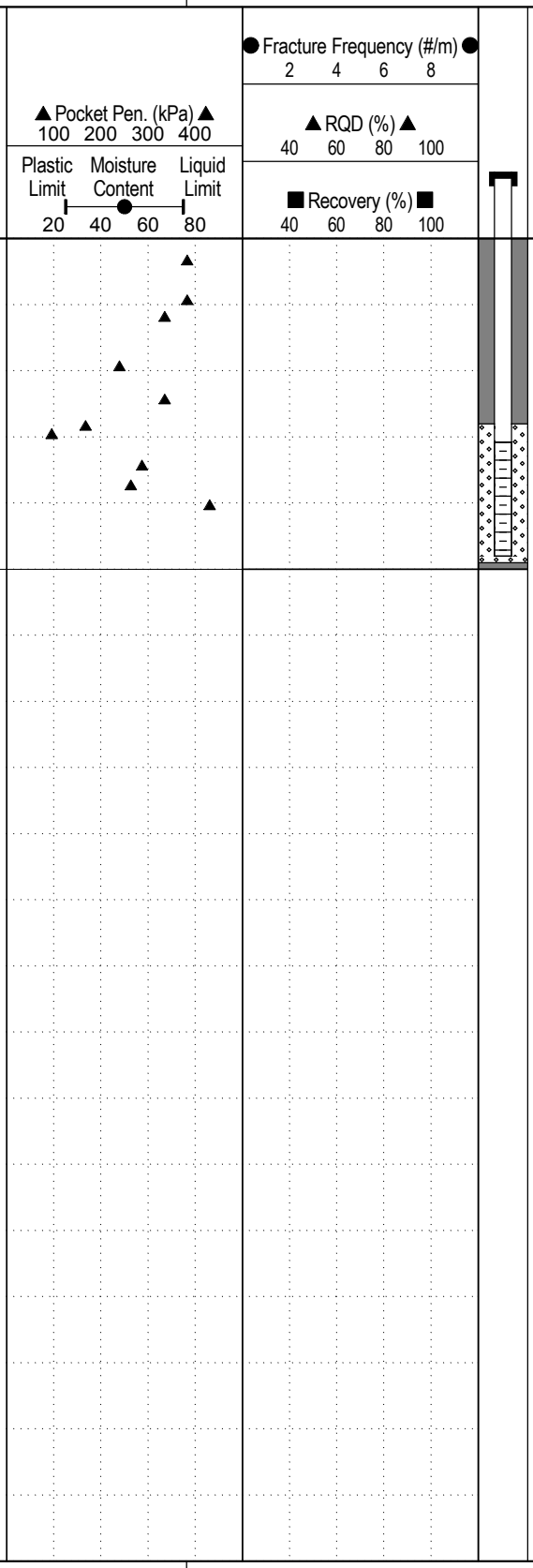
18				
19				
20				



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

TETRA TECH EBA

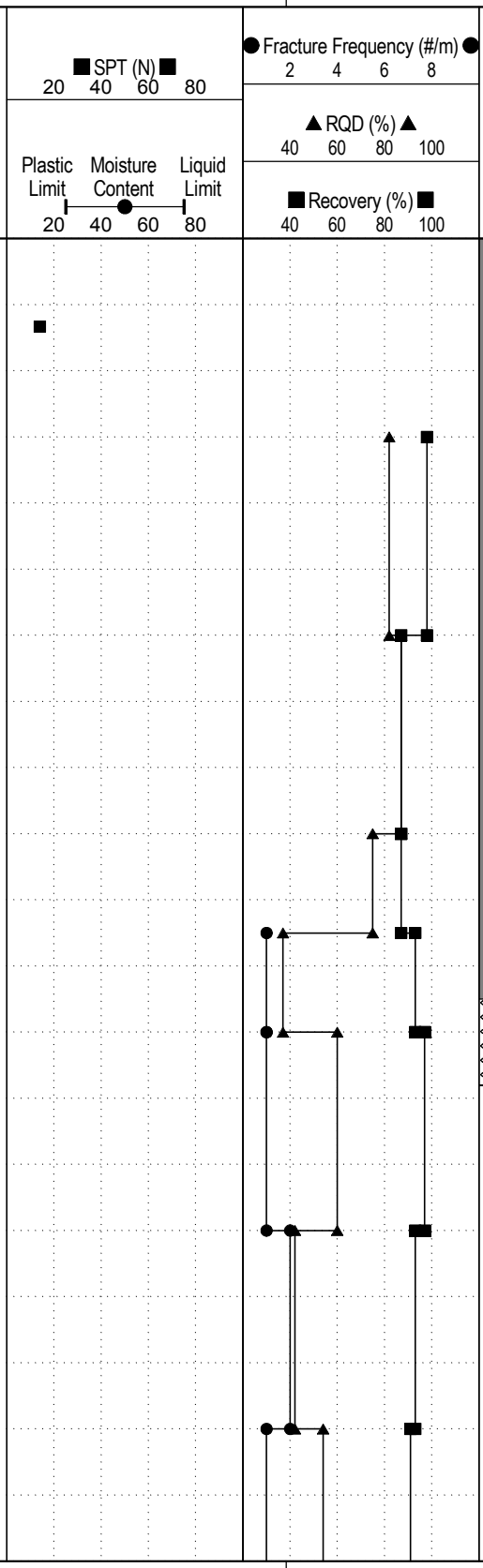
GEO/ROCK ZONE12.GPJ EBA.GDT 16/3/2

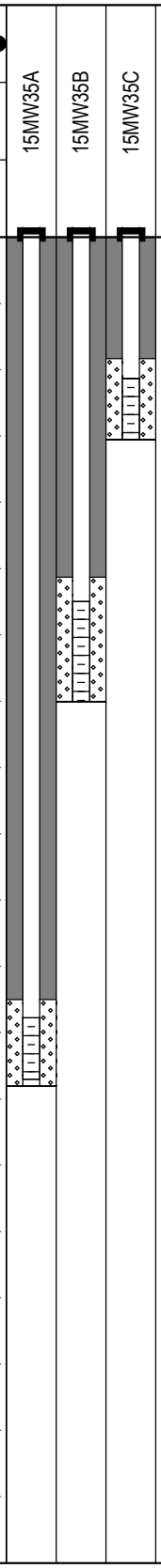
Clean Harbors Canada Inc.

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	Sample Type	Sample Number	SPT (N)	Moisture Content (%)	Elevation (m)
0	Wet Rotary/HQ Coring	CLAY (TILL) - sandy, plastic, brown			14		625
1							624
2		CLAY - trace of sand, high plastic, brown					623
3		SANDSTONE - weathered, fine grained, blue grey, intermittent clay shale laminations, mechanical fractures					622
4		- at 4.24 m, 50 mm thick siltstone bed		1			621
5		- at 4.94 m, 50 mm thick siltstone bed					620
6							619
7		CLAY SHALE - extremely weak, dark brown		2			618
8		- at 8.10 m, 50 mm thick coal seam					617
9		SANDSTONE - blue green, grey clay shale laminations					616
10				3			615
11		- at 10.80 m, increasing clay content		4			614
12		CLAY SHALE - moist, strong, dark brown, fracturing at interface					613
13							612
14		- at 13.27 m, 1 mm thick tan siltstone lamination		5			611
15							610
16		- at 15.10 m, minor slickensides, some fracturing, intermittent seashells - at 15.40 m, dark grey - at 16.00 m, 40 mm thick bentonite seam		6			609
17							608
18							607
19				7			606
20							605





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

TETRA TECH EBA

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				9								600
26												599
27												598
28		- at 27.50 m, intermittent 45-65° fractures		10								597
29	Wet Rotary/HQ Coring											596
30												595
31		SANDSTONE - fine grained, moist, strong, grey, coal laminations		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 - at 34.07 m, clay shale bed		12								591
35		- at 34.15 m, dark grey clay shale laminations - at 35.30 m, increasing clay content, dark brown										590
36		- 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: **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
		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
		MUDSTONE - very fine grained, brittle, grey grey										
42												583
		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										
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

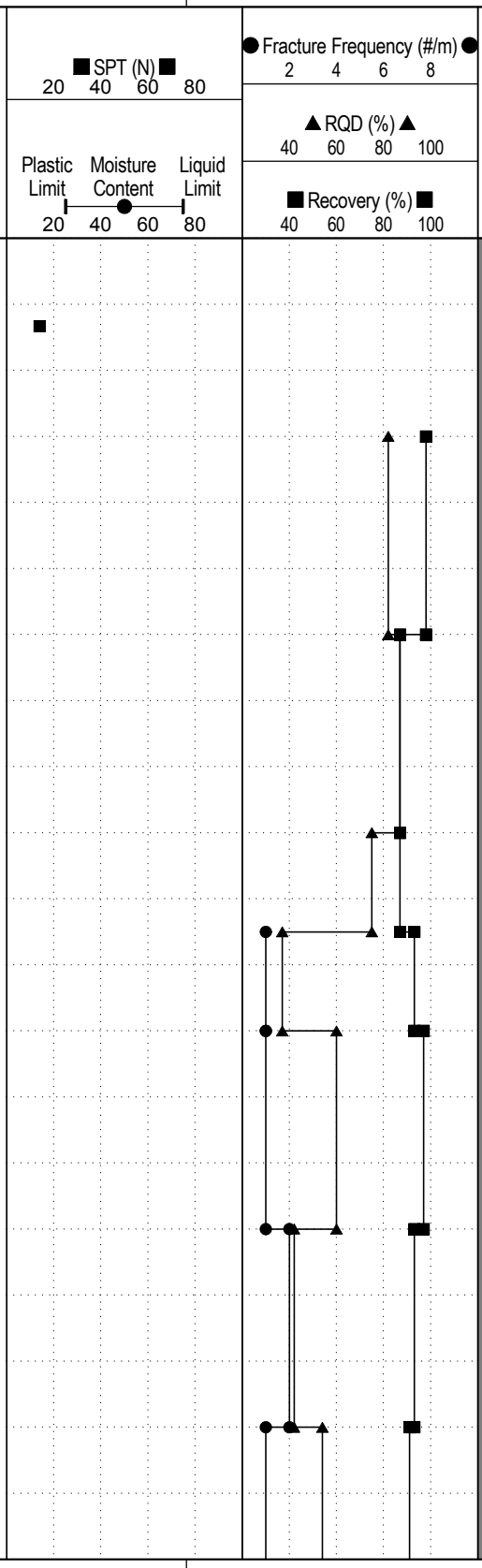
Contractor: Garritty and Baker	Completion Depth: 42.4 m
Drilling Rig Type:	Start Date: 2015 July 27
Logged By: BS	Completion Date: 2015 July 28
Reviewed By: TH	Page 3 of 3

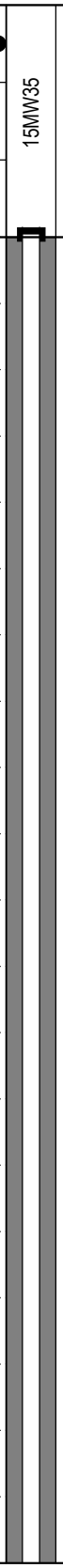
Clean Harbors Canada Inc.

Borehole No: **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	Wet Rotary/HQ Coring	CLAY (TILL) - sandy, plastic, brown			14	
		CLAY - trace of sand, high plastic, brown				
		SANDSTONE - weathered, fine grained, blue grey, intermittent clay shale laminations, mechanical fractures				
		- at 4.24 m, 50 mm thick siltstone bed		1		
		- at 4.94 m, 50 mm thick siltstone bed				
		CLAY SHALE - strong, dark brown		2		
		- at 8.10 m, 50 mm thick coal seam				
		SANDSTONE - blue green, grey clay shale laminations		3		
		- at 10.80 m, increasing clay content		4		
		CLAY SHALE - moist, strong, dark brown, fracturing at interface				
		- at 13.27 m, 1 mm thick tan siltstone lamination		5		
		- at 15.10 m, minor slickensides, some fracturing, intermittent seashells				
		- at 15.40 m, dark grey				
		- at 16.00 m, 40 mm thick bentonite seam		6		
20				7		





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

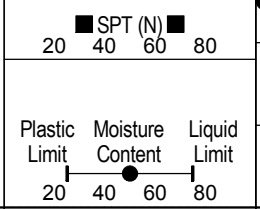
Contractor: Garritty and Baker	Completion Depth: 42.4 m
Drilling Rig Type:	Start Date: 2015 July 27
Logged By: BS	Completion Date: 2015 July 28
Reviewed By: TH	Page 1 of 3

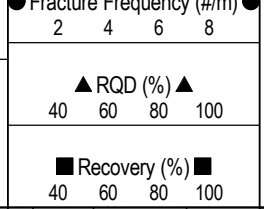
Clean Harbors Canada Inc.

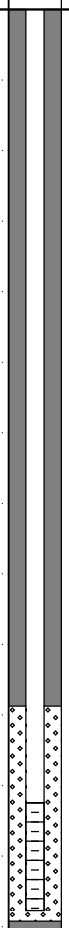
Borehole No: **15MW35Deep**

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 (%)
20						
21	Wet Rotary/HQ Coring	- at 21.20 m, increased fractures				
22				8		
23		- at 23.30 m, 100 mm thick tan siltstone bed				
24						
25				9		
26						
27		- at 27.50 m, intermittent 45-65° fractures				
28				10		
29						
30		SANDSTONE - fine grained, moist, strong, grey, coal laminations				
31				11		
32						
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				
34		- at 34.06 m, 10 mm thick coal seam - at 34.07 m, clay shale bed		12		
35		- at 34.15 m, dark grey clay shale laminations - at 35.30 m, increasing clay content, dark brown				
36		- at 35.40 m, 20 mm thick coal seam MUDSTONE - very fine grained, friable, extremely weak, brown to light brownish grey				
37				13		
38						
39		- light brownish grey, trace of coal fragments				
40		- at 39.40 m, 10 mm thick clay layer - silty, wet, soft, sticky, high plastic, grey				







Elevation (m): 605, 604, 603, 602, 601, 600, 599, 598, 597, 596, 595, 594, 593, 592, 591, 590, 589, 588, 587, 586, 585

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

TETRA TECH EBA

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
		MUDSTONE - very fine grained, brittle, grey grey								
42										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

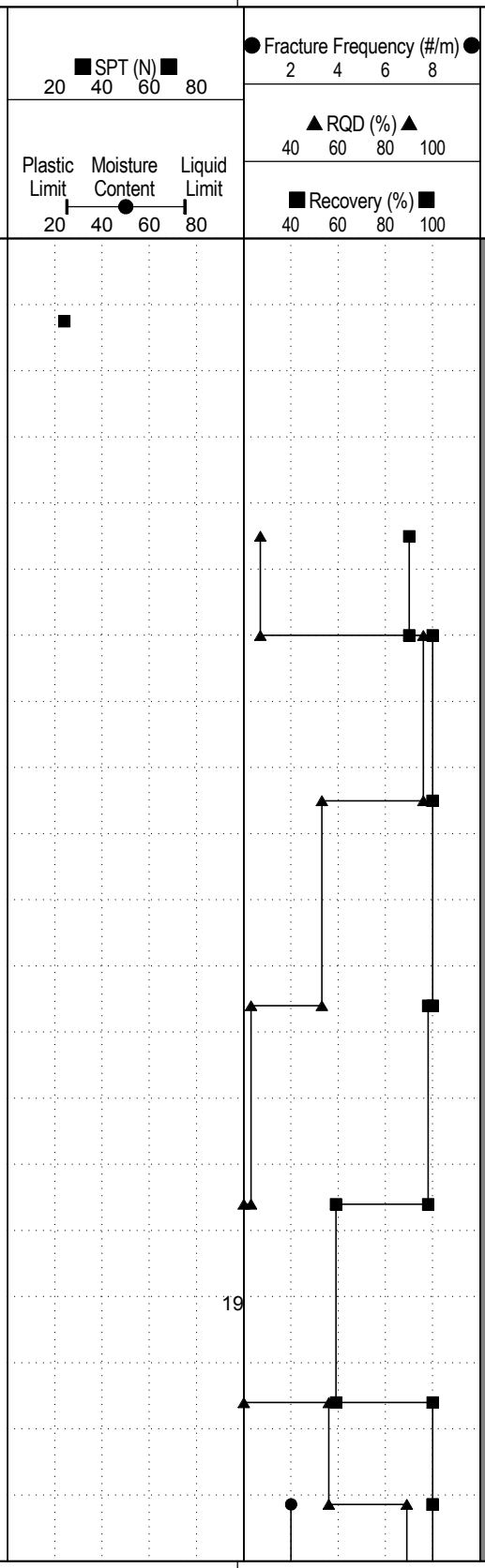
Contractor: Garritty and Baker	Completion Depth: 42.4 m
Drilling Rig Type:	Start Date: 2015 July 27
Logged By: BS	Completion Date: 2015 July 28
Reviewed By: TH	Page 3 of 3

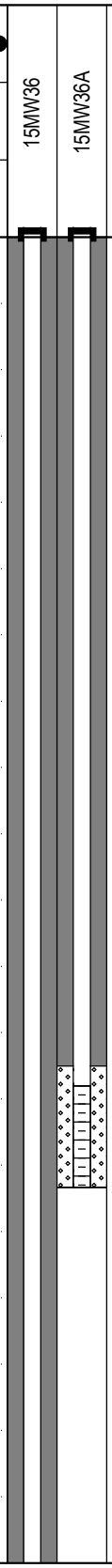
Clean Harbors Canada Inc.

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	Wet Rotary/HQ Coring	CLAY (TILL) - some silt, moist, plastic, brown			24	
		SAND - clayey, moist, brown				
		SANDSTONE - medium grained, blue grey, clay shale interbeds				
		CLAY SHALE - moist, strong, dark grey, mechanical fractures		1		
		SANDSTONE - medium grained, strong, light grey, laminated clay shale throughout, mechanical fractures		2		
		CLAY SHALE - moist, strong, dark grey, mechanical fractures		3		
		- at 1.220 mm, 200 mm thick siltstone layer - very fine grained, weak, light brown, mechanical fractures				
		- at 12.80 m, 20 mm thick seashell layer		4		
		- at 14.70 m, 10 mm thick bentonite lens				
				5		
		- at 17.00 m, intermittent shells throughout				
				6		
		- at 19.00 m, periodic 45-65° fractures				





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

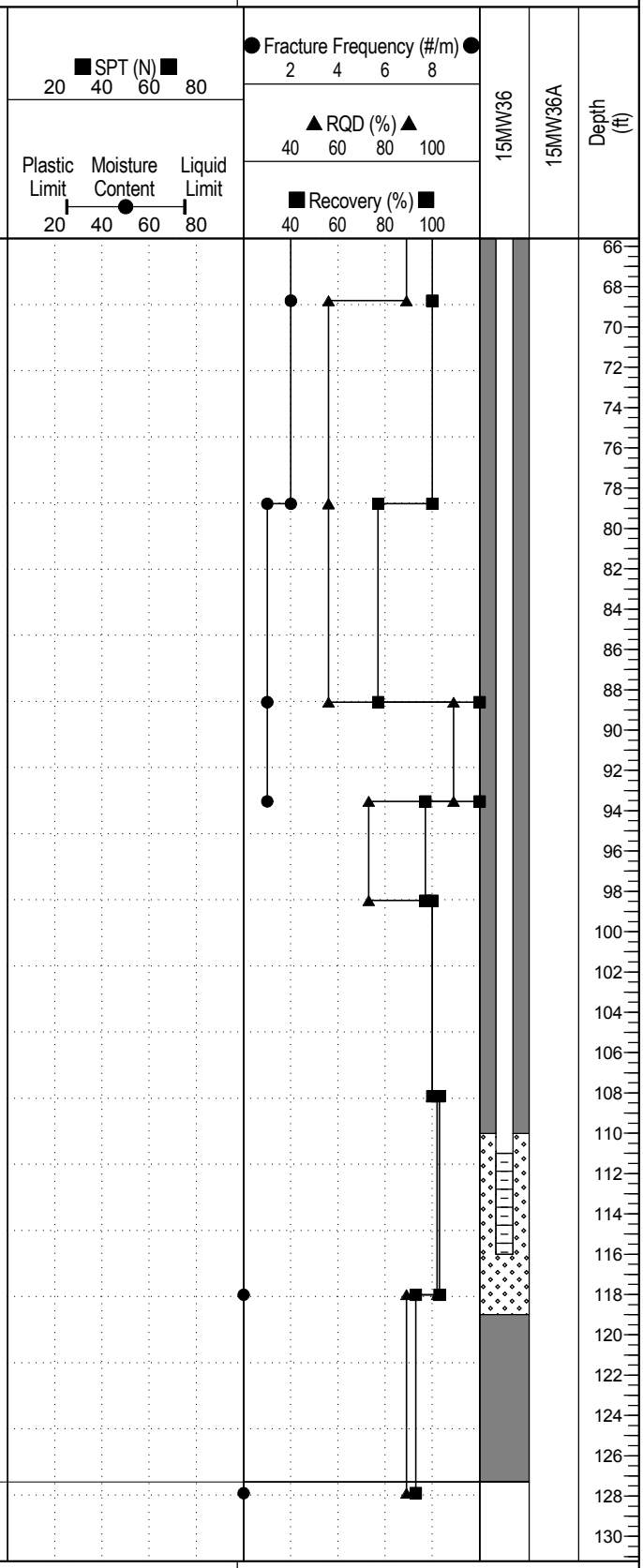
TETRA TECH EBA

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	Wet Rotary/HQ Coring			7		
21		- 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						
		SANDSTONE - fine to medium grained, strong, grey		12		
32		- at 32.23 m, clay shale laminations, 20 mm thick clay shale bed				
33		SILTSTONE - clay shale interbeds				
		SANDSTONE - fine grained, light grey, coal laminations				
34		- at 33.40 m, coal laminations at 140 mm intervals - at 33.80 m, coal laminations at 500 mm intervals				
35		- at 34.29 m, medium grained interbeds with light brown staining - at 34.76 m, coal inclusion		13		
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						



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

TETRA TECH EBA

Borehole No: **19MW37A**

Project: 2019 Groundwater Monitoring Program	Project No: SWM.SWOP04117-01
Location: Class I Waste Management Facility	
Ryley, Alberta	

Depth (m)	Method	Soil Description	Sample Type	Vapour readings (ppmv) 10 20 30 40	Notes and Comments	19MW37A	Depth (ft)
0	Solid stem auger	CLAY - organics, some silt, some gravel, dry, firm, non plastic, brown, frozen to 1.60 metres - no visible organics, trace gravel, medium plastic, iron inclusions					0, 2
1							4
		- some sand, no visible gravel, damp, soft, grey brown, fine to medium sand					6
2							8
		SAND - some silt, some clay, damp, soft, blue grey, medium sand					10
3							12
4		SANDSTONE - silty, clayey, dry, very weak, grey, medium sandstone					14
5							16, 18
6		- clayier CLAY SHALE - trace to some sand, very wet, grey, fine sand					20
7							22, 24
8							26, 28
9							30
10							32, 34
11							36, 38
12							40
13							42, 44
14		END OF BOREHOLE (13.50 metres) slough - 4.00 metres at 0 hrs. Monitoring well installed to 12.00 metres					46, 48
15							

Contractor: Clean Harbors	Completion Depth: 13.5 m
Drilling Rig Type: Truck mounted	Start Date: 2019 October 30
Logged By: MDB	Completion Date: 2019 October 30
Reviewed By: BA	Page 1 of 1

Borehole No: **19MW37B**

Project: 2019 Groundwater Monitoring Program	Project No: SWM.SWOP04117-01
Location: Class I Waste Management Facility	
Ryley, Alberta	

Depth (m)	Method	Soil Description	Sample Type	Vapour readings (ppmv) 10 20 30 40	Notes and Comments	19MW37B	Depth (ft)
0	Solid stem auger	CLAY - organics, some silt, some gravel, dry, firm, non plastic, brown, frozen to 1.60 metres - no visible organics, trace gravel, medium plastic, iron inclusions					0
1							2
							4
2		- some sand, no visible gravel, damp, soft, grey brown, fine to medium sand					6
							8
3		SAND - some silt, some clay, damp, soft, blue grey, medium sand					10
							12
4		SANDSTONE - silty, clayey, dry, very weak, grey, medium sandstone					14
5		END OF BOREHOLE (4.50 metres) Monitoring well installed to 4.20 metres					16
							18
6							20
							22
7							24
8							26
							28
9							30
							32
10							34
11							36
							38
12							40
							42
13							44
14							46
							48
15							

Contractor: Clean Harbors	Completion Depth: 4.5 m
Drilling Rig Type: Truck mounted	Start Date: 2019 October 30
Logged By: MDB	Completion Date: 2019 October 30
Reviewed By: BA	Page 1 of 1

Borehole No: **19MW38A**

Project: 2019 Groundwater Monitoring Program	Project No: SWM.SWOP04117-01
Location: Class I Waste Management Facility	
Ryley, Alberta	

Depth (m)	Method	Soil Description	Sample Type	Vapour readings (ppmv) 10 20 30 40	Notes and Comments	19MW38A	Depth (ft)
0							0
	Solid stem auger	CLAY (FILL) - some silt, some sand, trace gravel, loose, medium plastic, brown					
		CLAY - some silt, some sand, firm, high plastic, brown, fine to medium sand					
1							2, 4
2							6, 8
		- sandier					
3							10
		SAND - some silt, some clay, damp, soft, blue grey, medium sand					12
4							14
		SANDSTONE - silty, clayey, dry, very weak, grey, medium sandstone					16
5							18
6		CLAY SHALE - trace sand, very weak, grey, fine sand					20
7							22, 24
8							26
		- weak, dark brown					28
9							30
10							32, 34
11							36, 38
12							40
13							42
		END OF BOREHOLE (13.50 metres) Monitoring well installed to 13.40 metres					44
14							46
15							48

Contractor: Clean Harbors	Completion Depth: 13.5 m
Drilling Rig Type: Truck mounted	Start Date: 2019 October 30
Logged By: MDB	Completion Date: 2019 October 30
Reviewed By: BA	Page 1 of 1

Borehole No: **19MW38B**

Project: 2019 Groundwater Monitoring Program	Project No: SWM.SWOP04117-01
Location: Class I Waste Management Facility	
Ryley, Alberta	

Depth (m)	Method	Soil Description	Sample Type	Vapour readings (ppmv) 10 20 30 40	Notes and Comments	19MW38B	Depth (ft)
0							0
	Solid stem auger	CLAY (FILL) - some silt, some sand, trace gravel, loose, medium plastic, brown					
		CLAY - some silt, some sand, firm, high plastic, brown, fine to medium sand					
1							2, 4
2		- sandier					6, 8
3							10
		SAND - some silt, some clay, damp, soft, blue grey, medium sand					12
4							14
		SANDSTONE - silty, clayey, dry, very weak, grey, medium sandstone					16
5							18
		END OF BOREHOLE (5.50 metres) Monitoring well installed to 4.00 metres					
6							20
7							22, 24
8							26, 28
9							30
10							32, 34
11							36, 38
12							40
13							42, 44
14							46
15							48

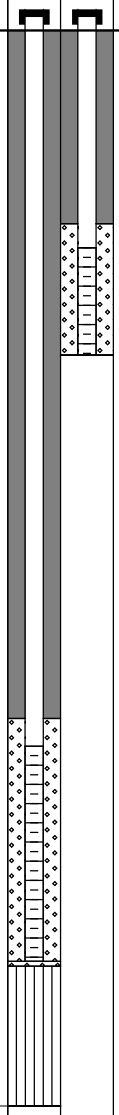
Contractor: Clean Harbors	Completion Depth: 5.5 m
Drilling Rig Type: Truck mounted	Start Date: 2019 October 30
Logged By: MDB	Completion Date: 2019 October 30
Reviewed By: BA	Page 1 of 1

Borehole No: **23MW38**

Clean Harbors

Project: Monitoring Well Installation	Project No: SWM.SWOP04591-03
Location: Ryley Facility	
Ryley, Alberta	

Depth (m)	Method	Soil Description	Sample Type	Sample Number	Notes and Comments
0		SAND (FILL) - silty, damp, grey, (150 mm thick)			Pipe A stickup = 0.96 metres Pipe B stickup = 0.86 metres
		CLAY (FILL) - sandy, light brown			
1		CLAY (TILL) - silty, sandy, trace gravel, moist, dark grey, laminated brown		B1	
		CLAY (TILL) AND SAND - trace gravel, damp to moist, brown		B2	
2		CLAY (TILL) - silty, some sand, moist, soft, grey			
		- 150 mm thick orange clay layer		B3	
3		SAND - some silt, some clay, medium grained sand, moist, soft, brownish grey		B4	
		- bluish grey, clay laminations		B5	
4		- some siltstone inclusions		B6	
		CLAY SHALE AND SANDSTONE - interbedded, residual soil, moist, bluish grey sandstone, brown clay shale			
		SANDSTONE - highly weathered, dry to damp, very weak, grey		B7	
5		- damp, interbedded siltstone		B8	
		SANDSTONE AND CLAY SHALE - interbedded, damp to moist, grey clay shale, light brown mottles		B9	
6	Solid stem auger	CLAY SHALE - trace sand, highly to completely weathered, fine grained sand, damp to moist, extremely weak, grey		B10	
7					
8		- completely weathered to residual soil, dark brown		B11	
9		- highly weathered, damp, grey			
10				B12	
11				B13	
12					
13				B14	
14		- moderately to highly weathered		B15	
15		END OF BOREHOLE (15.24 metres) Monitoring well A installed to 13.19 metres on December 19, 2023 water- 13.06 metres at 0 hrs. Monitoring well B installed to 4.60 metres on December 19, 2023 water - 2.48 metres at 0 hrs.			
16					
17					
18					
19					
20					



Contractor: Tundra Environmental and Geotechnical Drilling Ltd.	Completion Depth: 15.24 m
Equipment Type: Track mounted	Start Date: 2023 December 18
Logged By: WW	Completion Date: 2023 December 18
Reviewed By: SDB	Page 1 of 1

TETRA TECH

APPENDIX D

LABORATORY ANALYTICAL REPORTS

ALS Canada Ltd.

right solutions. right partner.

CERTIFICATE OF ANALYSIS

Work Order	: **EO2303925**	Page	: 1 of 8
Client	: **Tetra Tech Canada Inc.**	Laboratory	: Edmonton - Environmental
Contact	: William Wood	Account Manager	: Kieran Tordoff
Address	: North Building 14940 123 Ave NW Edmonton AB Canada T5V 1B4	Address	: 9450 - 17 Avenue NW Edmonton AB Canada T6N 1M9
Telephone	: 587-986-2709	Telephone	: +1 780 413 5227
Project	: 704-SWM.SWOP04591-03	Date Samples Received	: 17-May-2023 09:04
PO	: 704-SWM.SWOP04591-02	Date Analysis Commenced	: 17-May-2023
C-O-C number	: ----	Issue Date	: 24-May-2023 20:31
Sampler	: ----		
Site	: ----		
Quote number	: EO23-EBAE100-006 (Q83988)		
No. of samples received	: 3		
No. of samples analysed	: 3		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	*Position*	*Laboratory Department*
Alex Drake	Lab Analyst	Inorganics, Edmonton, Alberta
Alex Drake	Lab Analyst	Metals, Edmonton, Alberta
Brooke Miller	Laboratory Analyst	Inorganics, Edmonton, Alberta
Christian Murera	Lab Analyst	Organics, Edmonton, Alberta
Dan Nguyen	Team Leader - Inorganics	Metals, Edmonton, Alberta
Daniel Nguyen	Lab Assistant	Metals, Edmonton, Alberta
Jing Liu	Lab Assistant	Inorganics, Edmonton, Alberta
Ping Yeung	Team Leader - Inorganics	Inorganics, Edmonton, Alberta
Shruti Mudliar	Lab Analyst	Inorganics, Edmonton, Alberta
Yan Zhang	Lab Analyst	Organics, Edmonton, Alberta

General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances
LOR: Limit of Reporting (detection limit).

Unit	*Description*
-	no units
%	percent
µg/L	micrograms per litre
µS/cm	microsiemens per centimetre
mg/L	milligrams per litre
pH units	pH units

<: less than.

>: greater than.

Surrogate: An analyte that is similar in behavior to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Qualifiers

Qualifier	*Description*
DLDS	*Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.*
DLM	*Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).*
RRV	*Reported result verified by repeat analysis.*

Analytical Results

Sub-Matrix: **Water**
(Matrix: **Water**)

Analyte	CAS Number	Method/Lab	LOR	Unit	MW12B	19MW37A	19MW37B	----	----
				Client sampling date / time	15-May-2023 13:00	15-May-2023 10:57	15-May-2023 11:15	----	----
					EO2303925-001	EO2303925-002	EO2303925-003	--------	--------
					Result	Result	Result	----	----
Physical Tests									
Alkalinity, bicarbonate (as HCO3)	71-52-3	E290/EO	1.0	mg/L	817	844	931	----	----
Alkalinity, carbonate (as CO3)	3812-32-6	E290/EO	1.0	mg/L	9.6	23.9	<1.0	----	----
Alkalinity, hydroxide (as OH)	14280-30-9	E290/EO	1.0	mg/L	<1.0	<1.0	<1.0	----	----
Alkalinity, total (as CaCO3)	----	E290/EO	1.0	mg/L	686	732	763	----	----
Conductivity	----	E100/EO	1.0	µS/cm	7650	3480	1840	----	----
Hardness (as CaCO3), dissolved	----	EC100/EO	0.50	mg/L	415	59.1	298	----	----
pH	----	E108/EO	0.10	pH units	8.38	8.62	8.10	----	----
Solids, total dissolved [TDS], calculated	----	EC103/EO	1.0	mg/L	6370	2480	1260	----	----
Anions and Nutrients									
Ammonia, total (as N)	7664-41-7	E298/EO	0.0050	mg/L	1.44	1.42 RRV	0.951	----	----
Chloride	16887-00-6	E235.Cl/EO	0.50	mg/L	5.66 DLDS	4.33 DLDS	3.19 DLDS	----	----
Fluoride	16984-48-8	E235.F/EO	0.020	mg/L	0.330 DLDS	0.545 DLDS	0.189 DLDS	----	----
Kjeldahl nitrogen, total [TKN]	----	E318/EO	0.050	mg/L	3.71	1.89	1.24	----	----
Nitrate (as N)	14797-55-8	E235.NO3/EO	0.020	mg/L	1.47 DLDS	<0.100 DLDS	<0.100 DLDS	----	----
Nitrate + Nitrite (as N)	----	EC235.N+N/EO	0.0032	mg/L	2.03	<0.112	<0.112	----	----
Nitrite (as N)	14797-65-0	E235.NO2/EO	0.010	mg/L	0.559 DLDS	<0.050 DLDS	<0.050 DLDS	----	----
Sulfate (as SO4)	14808-79-8	E235.SO4/EO	0.30	mg/L	3770 DLDS	1150 DLDS	300 DLDS	----	----
Organic / Inorganic Carbon									
Carbon, dissolved organic [DOC]	----	E358-L/EO	0.50	mg/L	14.2	12.7	8.66	----	----
Ion Balance									
Ion balance (cations/anions)	----	EC101/EO	0.010	%	102	97.9	103	----	----
Dissolved Metals									
Aluminum, dissolved	7429-90-5	E421/EO	0.0010	mg/L	0.256	0.0254	<0.0010	----	----
Antimony, dissolved	7440-36-0	E421/EO	0.00010	mg/L	<0.00100 DLM	<0.00100 DLM	<0.00010	----	----
Arsenic, dissolved	7440-38-2	E421/EO	0.00010	mg/L	<0.00100 DLM	<0.00100 DLM	0.00052	----	----
Barium, dissolved	7440-39-3	E421/EO	0.00010	mg/L	0.0202	0.00730	0.0231	----	----
Beryllium, dissolved	7440-41-7	E421/EO	0.000020	mg/L	<0.000200 DLM	<0.000200 DLM	<0.000020	----	----
Bismuth, dissolved	7440-69-9	E421/EO	0.000050	mg/L	<0.000500 DLM	<0.000500 DLM	<0.000050	----	----

Analytical Results

Sub-Matrix: Water (Matrix: Water)				Client sample ID	MW12B	19MW37A	19MW37B	----	----
				Client sampling date / time	15-May-2023 13:00	15-May-2023 10:57	15-May-2023 11:15	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit	EO2303925-001	EO2303925-002	EO2303925-003	--------	--------
					Result	Result	Result	----	----
Dissolved Metals									
Boron, dissolved	7440-42-8	E421/EO	0.010	mg/L	0.694	0.850	0.154	----	----
Cadmium, dissolved	7440-43-9	E421/EO	0.0000050	mg/L	<0.0000500 DLM	<0.0000500 DLM	<0.0000050	----	----
Calcium, dissolved	7440-70-2	E421/EO	0.050	mg/L	134	17.8	71.2	----	----
Cesium, dissolved	7440-46-2	E421/EO	0.000010	mg/L	0.000117	<0.000100 DLM	0.000057	----	----
Chromium, dissolved	7440-47-3	E421/EO	0.00050	mg/L	<0.00500 DLM	<0.00500 DLM	<0.00050	----	----
Cobalt, dissolved	7440-48-4	E421/EO	0.00010	mg/L	0.00213	<0.00100 DLM	0.00065	----	----
Copper, dissolved	7440-50-8	E421/EO	0.00020	mg/L	<0.00200 DLM	<0.00200 DLM	0.00021	----	----
Iron, dissolved	7439-89-6	E421/EO	0.010	mg/L	0.216	<0.100 DLM	<0.010	----	----
Lead, dissolved	7439-92-1	E421/EO	0.000050	mg/L	<0.000500 DLM	<0.000500 DLM	<0.000050	----	----
Lithium, dissolved	7439-93-2	E421/EO	0.0010	mg/L	0.468	0.217	0.167	----	----
Magnesium, dissolved	7439-95-4	E421/EO	0.0050	mg/L	19.5	3.55	29.1	----	----
Manganese, dissolved	7439-96-5	E421/EO	0.00010	mg/L	0.322	0.215	0.227	----	----
Mercury, dissolved	7439-97-6	E509/EO	0.0000050	mg/L	<0.0000050	<0.0000050	<0.0000050	----	----
Molybdenum, dissolved	7439-98-7	E421/EO	0.000050	mg/L	0.0183	0.00119	0.000150	----	----
Nickel, dissolved	7440-02-0	E421/EO	0.00050	mg/L	0.0795	<0.00500 DLM	0.00073	----	----
Phosphorus, dissolved	7723-14-0	E421/EO	0.050	mg/L	<0.500 DLM	<0.500 DLM	<0.050	----	----
Potassium, dissolved	7440-09-7	E421/EO	0.050	mg/L	7.57	3.27	8.99	----	----
Rubidium, dissolved	7440-17-7	E421/EO	0.00020	mg/L	0.0132	0.00532	0.00820	----	----
Selenium, dissolved	7782-49-2	E421/EO	0.000050	mg/L	<0.000500 DLM	<0.000500 DLM	<0.000050	----	----
Silicon, dissolved	7440-21-3	E421/EO	0.050	mg/L	4.33	3.88	5.30	----	----
Silver, dissolved	7440-22-4	E421/EO	0.000010	mg/L	<0.000100 DLM	<0.000100 DLM	<0.000010	----	----
Sodium, dissolved	7440-23-5	E421/EO	0.050	mg/L	1980	840	369	----	----
Strontium, dissolved	7440-24-6	E421/EO	0.00020	mg/L	2.95	0.375	0.804	----	----
Sulfur, dissolved	7704-34-9	E421/EO	0.50	mg/L	1470	415	122	----	----
Tellurium, dissolved	13494-80-9	E421/EO	0.00020	mg/L	<0.00200 DLM	<0.00200 DLM	<0.00020	----	----
Thallium, dissolved	7440-28-0	E421/EO	0.000010	mg/L	<0.000100 DLM	<0.000100 DLM	<0.000010	----	----
Thorium, dissolved	7440-29-1	E421/EO	0.00010	mg/L	<0.00100 DLM	<0.00100 DLM	<0.00010	----	----
Tin, dissolved	7440-31-5	E421/EO	0.00010	mg/L	<0.00100 DLM	<0.00100 DLM	0.00014	----	----
Titanium, dissolved	7440-32-6	E421/EO	0.00030	mg/L	0.00809	<0.00300 DLM	<0.00030	----	----
Tungsten, dissolved	7440-33-7	E421/EO	0.00010	mg/L	<0.00100 DLM	<0.00100 DLM	<0.00010	----	----

Analytical Results

Sub-Matrix: Water (Matrix: Water)				Client sample ID	MW12B	19MW37A	19MW37B	----	----
				Client sampling date / time	15-May-2023 13:00	15-May-2023 10:57	15-May-2023 11:15	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit	EO2303925-001	EO2303925-002	EO2303925-003	--------	--------
					Result	Result	Result	----	----
Dissolved Metals									
Uranium, dissolved	7440-61-1	E421/EO	0.000010	mg/L	0.0150	0.00219	0.000219	----	----
Vanadium, dissolved	7440-62-2	E421/EO	0.00050	mg/L	<0.00500 DLM	<0.00500 DLM	<0.00050	----	----
Zinc, dissolved	7440-66-6	E421/EO	0.0010	mg/L	<0.0100 DLM	<0.0100 DLM	0.0011	----	----
Zirconium, dissolved	7440-67-7	E421/EO	0.00020	mg/L	<0.00200 DLM	<0.00200 DLM	0.00033	----	----
Dissolved mercury filtration location	----	EP509/EO	-	-	Field	Field	Field	----	----
Dissolved metals filtration location	----	EP421/EO	-	-	Field	Field	Field	----	----
Aggregate Organics									
Phenols, total (4AAP)	----	E562/EO	0.0010	mg/L	0.0041	0.0046	0.0030	----	----
Volatile Organic Compounds									
Benzene	71-43-2	E611E/EO	0.50	µg/L	<0.50	<0.50	<0.50	----	----
Benzene	71-43-2	E611A/EO	0.00050	mg/L	<0.00050	<0.00050	<0.00050	----	----
Bromobenzene	108-86-1	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Bromochloromethane	74-97-5	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Bromodichloromethane	75-27-4	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Bromoform	75-25-2	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Bromomethane	74-83-9	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Butylbenzene, n-	104-51-8	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Butylbenzene, sec-	135-98-8	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Butylbenzene, tert-	98-06-6	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Carbon tetrachloride	56-23-5	E611E/EO	0.50	µg/L	<0.50	<0.50	<0.50	----	----
Chlorobenzene	108-90-7	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Chloroethane	75-00-3	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Chloroform	67-66-3	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Chloromethane	74-87-3	E611E/EO	5.0	µg/L	<5.0	<5.0	<5.0	----	----
Chlorotoluene, 2-	95-49-8	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Chlorotoluene, 4-	106-43-4	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Cymene, p-	99-87-6	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Dibromo-3-chloropropane, 1,2-	96-12-8	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Dibromochloromethane	124-48-1	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Dibromoethane, 1,2-	106-93-4	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	----	----

Analytical Results

Sub-Matrix: Water (Matrix: Water)				Client sample ID	MW12B	19MW37A	19MW37B	----	----
				Client sampling date / time	15-May-2023 13:00	15-May-2023 10:57	15-May-2023 11:15	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit	EO2303925-001	EO2303925-002	EO2303925-003	--------	--------
					Result	Result	Result	----	----
Volatile Organic Compounds									
Dibromomethane	74-95-3	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Dichlorobenzene, 1,2-	95-50-1	E611E/EO	0.50	µg/L	<0.50	<0.50	<0.50	----	----
Dichlorobenzene, 1,3-	541-73-1	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Dichlorobenzene, 1,4-	106-46-7	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Dichlorodifluoromethane	75-71-8	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Dichloroethane, 1,1-	75-34-3	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Dichloroethane, 1,2-	107-06-2	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Dichloroethylene, 1,1-	75-35-4	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Dichloroethylene, cis-1,2-	156-59-2	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Dichloroethylene, trans-1,2-	156-60-5	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Dichloromethane	75-09-2	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Dichloropropane, 1,2-	78-87-5	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Dichloropropane, 1,3-	142-28-9	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Dichloropropane, 2,2-	594-20-7	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Dichloropropylene, 1,1-	563-58-6	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Dichloropropylene, cis+trans-1,3-	542-75-6	E611E/EO	1.5	µg/L	<1.5	<1.5	<1.5	----	----
Dichloropropylene, cis-1,3-	10061-01-5	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Dichloropropylene, trans-1,3-	10061-02-6	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Ethylbenzene	100-41-4	E611E/EO	0.50	µg/L	<0.50	<0.50	<0.50	----	----
Ethylbenzene	100-41-4	E611A/EO	0.00050	mg/L	<0.00050	<0.00050	<0.00050	----	----
Hexachlorobutadiene	87-68-3	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Isopropylbenzene	98-82-8	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Methyl-tert-butyl ether [MTBE]	1634-04-4	E611E/EO	0.50	µg/L	<0.50	<0.50	<0.50	----	----
Propylbenzene, n-	103-65-1	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Styrene	100-42-5	E611E/EO	0.50	µg/L	<0.50	<0.50	<0.50	----	----
Styrene	100-42-5	E611A/EO	0.00050	mg/L	<0.00050	<0.00050	<0.00050	----	----
Tetrachloroethane, 1,1,1,2-	630-20-6	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Tetrachloroethane, 1,1,2,2-	79-34-5	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Tetrachloroethylene	127-18-4	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Toluene	108-88-3	E611E/EO	0.50	µg/L	<0.50	<0.50	<0.50	----	----

Analytical Results

Sub-Matrix: Water (Matrix: Water)				Client sample ID	MW12B	19MW37A	19MW37B	----	----
				Client sampling date / time	15-May-2023 13:00	15-May-2023 10:57	15-May-2023 11:15	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit	EO2303925-001	EO2303925-002	EO2303925-003	--------	--------
					Result	Result	Result	----	----
Volatile Organic Compounds									
Toluene	108-88-3	E611A/EO	0.00050	mg/L	<0.00050	<0.00050	<0.00050	----	----
Trichlorobenzene, 1,2,3-	87-61-6	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Trichlorobenzene, 1,2,4-	120-82-1	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Trichloroethane, 1,1,1-	71-55-6	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Trichloroethane, 1,1,2-	79-00-5	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Trichloroethylene	79-01-6	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Trichlorofluoromethane	75-69-4	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Trichloropropane, 1,2,3-	96-18-4	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Trimethylbenzene, 1,2,4-	95-63-6	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Trimethylbenzene, 1,3,5-	108-67-8	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Vinyl chloride	75-01-4	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Xylene, m+p-	179601-23-1	E611E/EO	0.40	µg/L	<0.40	<0.40	<0.40	----	----
Xylene, m+p-	179601-23-1	E611A/EO	0.00040	mg/L	<0.00040	<0.00040	<0.00040	----	----
Xylene, o-	95-47-6	E611E/EO	0.30	µg/L	<0.30	<0.30	<0.30	----	----
Xylene, o-	95-47-6	E611A/EO	0.00030	mg/L	<0.00030	<0.00030	<0.00030	----	----
Xylenes, total	1330-20-7	E611E/EO	0.50	µg/L	<0.50	<0.50	<0.50	----	----
Xylenes, total	1330-20-7	E611A/EO	0.00050	mg/L	<0.00050	<0.00050	<0.00050	----	----
BTEX, total	----	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Trihalomethanes [THMs], total	----	E611E/EO	2.0	µg/L	<2.0	<2.0	<2.0	----	----
Hydrocarbons									
F1 (C6-C10)	----	E581.F1/EO	0.10	mg/L	<0.10	<0.10	<0.10	----	----
F2 (C10-C16)	----	E601/EO	0.10	mg/L	<0.10	<0.10	<0.10	----	----
F1-BTEX	----	EC580/EO	0.100	mg/L	<0.100	<0.100	<0.100	----	----
Hydrocarbons Surrogates									
Bromobenzotrifluoride, 2- (F2-F4 surrogate)	392-83-6	E601/EO	1.0	%	99.4	99.9	98.1	----	----
Dichlorotoluene, 3,4-	95-75-0	E581.F1/EO	1.0	%	120	115	127	----	----
Volatile Organic Compounds Surrogates									
Bromofluorobenzene, 4-	460-00-4	E611A/EO	1.0	%	82.7	76.4	79.7	----	----
Bromofluorobenzene, 4-	460-00-4	E611E/EO	1.0	%	82.7	76.4	79.7	----	----
Difluorobenzene, 1,4-	540-36-3	E611A/EO	1.0	%	92.8	93.4	93.9	----	----

Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	MW12B	19MW37A	19MW37B	----	----
					Client sampling date / time	15-May-2023 13:00	15-May-2023 10:57	15-May-2023 11:15	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit		EO2303925-001	EO2303925-002	EO2303925-003	--------	--------
						Result	Result	Result	----	----
Volatile Organic Compounds Surrogates										
Difluorobenzene, 1,4-	540-36-3	E611E/EO	1.0	%		92.8	93.4	93.9	----	----

Please refer to the General Comments section for an explanation of any result qualifiers detected.

Please refer to the Accreditation section for an explanation of analyte accreditations.

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QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **EO2303925**	Page	: 1 of 15
Client	: **Tetra Tech Canada Inc.**	Laboratory	: Edmonton - Environmental
Contact	: William Wood	Account Manager	: Kieran Tordoff
Address	: North Building 14940 123 Ave NW Edmonton AB Canada T5V 1B4	Address	: 9450 - 17 Avenue NW Edmonton, Alberta Canada T6N 1M9
Telephone	: 587-986-2709	Telephone	: +1 780 413 5227
Project	: 704-SWM.SWOP04591-03	Date Samples Received	: 17-May-2023 09:04
PO	: 704-SWM.SWOP04591-02	Issue Date	: 24-May-2023 20:32
C-O-C number	: ----		
Sampler	: ----		
Site	: ----		
Quote number	: EO23-EBAE100-006 (Q83988)		
No. of samples received	: 3		
No. of samples analysed	: 3		

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

Key

Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number: Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO: Data Quality Objective.
LOR: Limit of Reporting (detection limit).
RPD: Relative Percent Difference.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- Analysis Holding Time Outliers exist - please see following pages for full details.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.

Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid)										
19MW37A	E562	15-May-2023	19-May-2023	----	----		20-May-2023	28 days	5 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid)										
19MW37B	E562	15-May-2023	19-May-2023	----	----		20-May-2023	28 days	5 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid)										
MW12B	E562	15-May-2023	19-May-2023	----	----		20-May-2023	28 days	5 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
19MW37A	E298	15-May-2023	19-May-2023	----	----		20-May-2023	28 days	5 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
19MW37B	E298	15-May-2023	19-May-2023	----	----		20-May-2023	28 days	5 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
MW12B	E298	15-May-2023	19-May-2023	----	----		20-May-2023	28 days	5 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE										
19MW37A	E235.Cl	15-May-2023	17-May-2023	----	----		17-May-2023	28 days	2 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times: Rec	Holding Times: Actual	Eval	Analysis: Analysis Date	Holding Times: Rec	Holding Times: Actual	Eval
Anions and Nutrients : Chloride in Water by IC										
HDPE 19MW37B	E235.Cl	15-May-2023	17-May-2023	----	----		17-May-2023	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE MW12B	E235.Cl	15-May-2023	17-May-2023	----	----		17-May-2023	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE 19MW37A	E235.F	15-May-2023	17-May-2023	----	----		17-May-2023	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE 19MW37B	E235.F	15-May-2023	17-May-2023	----	----		17-May-2023	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE MW12B	E235.F	15-May-2023	17-May-2023	----	----		17-May-2023	28 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE 19MW37A	E235.NO3	15-May-2023	17-May-2023	----	----		17-May-2023	3 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE 19MW37B	E235.NO3	15-May-2023	17-May-2023	----	----		17-May-2023	3 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE MW12B	E235.NO3	15-May-2023	17-May-2023	----	----		17-May-2023	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE 19MW37A	E235.NO2	15-May-2023	17-May-2023	----	----		17-May-2023	3 days	2 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times: Rec	Holding Times: Actual	Eval	Analysis: Analysis Date	Holding Times: Rec	Holding Times: Actual	Eval
Anions and Nutrients : Nitrite in Water by IC										
HDPE										
19MW37B	E235.NO2	15-May-2023	17-May-2023	----	----		17-May-2023	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE										
MW12B	E235.NO2	15-May-2023	17-May-2023	----	----		17-May-2023	3 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE										
19MW37A	E235.SO4	15-May-2023	17-May-2023	----	----		17-May-2023	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE										
19MW37B	E235.SO4	15-May-2023	17-May-2023	----	----		17-May-2023	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE										
MW12B	E235.SO4	15-May-2023	17-May-2023	----	----		17-May-2023	28 days	2 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid)										
19MW37A	E318	15-May-2023	19-May-2023	----	----		19-May-2023	28 days	4 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid)										
19MW37B	E318	15-May-2023	19-May-2023	----	----		19-May-2023	28 days	4 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid)										
MW12B	E318	15-May-2023	19-May-2023	----	----		19-May-2023	28 days	4 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
19MW37A	E509	15-May-2023	17-May-2023	----	----		17-May-2023	28 days	2 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis: Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
19MW37B	E509	15-May-2023	17-May-2023	----	----		17-May-2023	28 days	2 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
MW12B	E509	15-May-2023	17-May-2023	----	----		17-May-2023	28 days	2 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved)										
19MW37A	E421	15-May-2023	17-May-2023	----	----		18-May-2023	180 days	3 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved)										
19MW37B	E421	15-May-2023	17-May-2023	----	----		18-May-2023	180 days	3 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved)										
MW12B	E421	15-May-2023	17-May-2023	----	----		18-May-2023	180 days	3 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate)										
19MW37A	E581.F1	15-May-2023	17-May-2023	----	----		17-May-2023	14 days	2 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate)										
19MW37B	E581.F1	15-May-2023	17-May-2023	----	----		17-May-2023	14 days	2 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate)										
MW12B	E581.F1	15-May-2023	17-May-2023	----	----		17-May-2023	14 days	2 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate)										
19MW37A	E601	15-May-2023	17-May-2023	14 days	2 days	✓	17-May-2023	40 days	0 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis: Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate)										
19MW37B	E601	15-May-2023	17-May-2023	14 days	2 days	✓	17-May-2023	40 days	0 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate)										
MW12B	E601	15-May-2023	17-May-2023	14 days	2 days	✓	17-May-2023	40 days	0 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid)										
19MW37A	E358-L	15-May-2023	18-May-2023	----	----		18-May-2023	28 days	3 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid)										
19MW37B	E358-L	15-May-2023	18-May-2023	----	----		18-May-2023	28 days	3 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid)										
MW12B	E358-L	15-May-2023	18-May-2023	----	----		18-May-2023	28 days	3 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE										
19MW37A	E290	15-May-2023	19-May-2023	----	----		19-May-2023	14 days	4 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE										
19MW37B	E290	15-May-2023	19-May-2023	----	----		19-May-2023	14 days	4 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE										
MW12B	E290	15-May-2023	19-May-2023	----	----		19-May-2023	14 days	4 days	✓
Physical Tests : Conductivity in Water										
HDPE										
19MW37A	E100	15-May-2023	19-May-2023	----	----		19-May-2023	28 days	4 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times: Rec	Holding Times: Actual	Eval	Analysis: Analysis Date	Holding Times: Rec	Holding Times: Actual	Eval
Physical Tests : Conductivity in Water										
HDPE 19MW37B	E100	15-May-2023	19-May-2023	----	----		19-May-2023	28 days	4 days	✓
Physical Tests : Conductivity in Water										
HDPE MW12B	E100	15-May-2023	19-May-2023	----	----		19-May-2023	28 days	4 days	✓
Physical Tests : pH by Meter										
HDPE 19MW37A	E108	15-May-2023	19-May-2023	----	----		19-May-2023	0.25 hrs	0.29 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE 19MW37B	E108	15-May-2023	19-May-2023	----	----		19-May-2023	0.25 hrs	0.29 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE MW12B	E108	15-May-2023	19-May-2023	----	----		19-May-2023	0.25 hrs	0.29 hrs	× EHTR-FM
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) 19MW37A	E611A	15-May-2023	17-May-2023	----	----		17-May-2023	14 days	2 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) 19MW37B	E611A	15-May-2023	17-May-2023	----	----		17-May-2023	14 days	2 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) MW12B	E611A	15-May-2023	17-May-2023	----	----		17-May-2023	14 days	2 days	✓
Volatile Organic Compounds : VOCs (Prairies List) by Headspace GC-MS										
Glass vial (sodium bisulfate) 19MW37A	E611E	15-May-2023	17-May-2023	----	----		17-May-2023	14 days	2 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Volatile Organic Compounds : VOCs (Prairies List) by Headspace GC-MS										
Glass vial (sodium bisulfate)										
19MW37B	E611E	15-May-2023	17-May-2023	----	----		17-May-2023	14 days	2 days	✓
Volatile Organic Compounds : VOCs (Prairies List) by Headspace GC-MS										
Glass vial (sodium bisulfate)										
MW12B	E611E	15-May-2023	17-May-2023	----	----		17-May-2023	14 days	2 days	✓

Legend & Qualifier Definitions

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended

Rec. HT: ALS recommended hold time (see units).

Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Water**

Evaluation: × = *QC frequency outside specification*; ✓ = *QC frequency within specification.*

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Duplicates (DUP)							
Alkalinity Species by Titration	E290	944632	1	10	10.0	5.0	✓
Ammonia by Fluorescence	E298	946841	1	20	5.0	5.0	✓
BTEX by Headspace GC-MS	E611A	942142	1	4	25.0	5.0	✓
CCME PHC - F1 by Headspace GC-FID	E581.F1	942143	1	4	25.0	5.0	✓
Chloride in Water by IC	E235.Cl	943164	1	15	6.6	5.0	✓
Conductivity in Water	E100	944631	1	10	10.0	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	942180	1	17	5.8	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	942323	1	20	5.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	945284	1	20	5.0	5.0	✓
Fluoride in Water by IC	E235.F	943161	1	12	8.3	5.0	✓
Nitrate in Water by IC	E235.NO3	943162	1	12	8.3	5.0	✓
Nitrite in Water by IC	E235.NO2	943165	1	12	8.3	5.0	✓
pH by Meter	E108	944630	1	18	5.5	5.0	✓
Phenols (4AAP) in Water by Colorimetry	E562	946529	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	943163	1	14	7.1	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	943964	1	15	6.6	5.0	✓
VOCs (Prairies List) by Headspace GC-MS	E611E	942144	1	4	25.0	5.0	✓
Laboratory Control Samples (LCS)							
Alkalinity Species by Titration	E290	944632	1	10	10.0	5.0	✓
Ammonia by Fluorescence	E298	946841	1	20	5.0	5.0	✓
BTEX by Headspace GC-MS	E611A	942142	1	4	25.0	5.0	✓
CCME PHC - F1 by Headspace GC-FID	E581.F1	942143	1	4	25.0	5.0	✓
CCME PHCs - F2-F4 by GC-FID	E601	942096	1	20	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	943164	1	15	6.6	5.0	✓
Conductivity in Water	E100	944631	1	10	10.0	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	942180	1	17	5.8	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	942323	1	20	5.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	945284	1	20	5.0	5.0	✓
Fluoride in Water by IC	E235.F	943161	1	12	8.3	5.0	✓
Nitrate in Water by IC	E235.NO3	943162	1	12	8.3	5.0	✓
Nitrite in Water by IC	E235.NO2	943165	1	12	8.3	5.0	✓
pH by Meter	E108	944630	1	18	5.5	5.0	✓
Phenols (4AAP) in Water by Colorimetry	E562	946529	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	943163	1	14	7.1	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	943964	1	15	6.6	5.0	✓
VOCs (Prairies List) by Headspace GC-MS	E611E	942144	1	4	25.0	5.0	✓

Matrix: **Water**

Evaluation: × = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Method Blanks (MB)							
Alkalinity Species by Titration	E290	944632	1	10	10.0	5.0	✓
Ammonia by Fluorescence	E298	946841	1	20	5.0	5.0	✓
BTEX by Headspace GC-MS	E611A	942142	1	4	25.0	5.0	✓
CCME PHC - F1 by Headspace GC-FID	E581.F1	942143	1	4	25.0	5.0	✓
CCME PHCs - F2-F4 by GC-FID	E601	942096	1	20	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	943164	1	15	6.6	5.0	✓
Conductivity in Water	E100	944631	1	10	10.0	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	942180	1	17	5.8	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	942323	1	20	5.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	945284	1	20	5.0	5.0	✓
Fluoride in Water by IC	E235.F	943161	1	12	8.3	5.0	✓
Nitrate in Water by IC	E235.NO3	943162	1	12	8.3	5.0	✓
Nitrite in Water by IC	E235.NO2	943165	1	12	8.3	5.0	✓
Phenols (4AAP) in Water by Colorimetry	E562	946529	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	943163	1	14	7.1	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	943964	1	15	6.6	5.0	✓
VOCs (Prairies List) by Headspace GC-MS	E611E	942144	1	4	25.0	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	946841	1	20	5.0	5.0	✓
BTEX by Headspace GC-MS	E611A	942142	1	4	25.0	5.0	✓
Chloride in Water by IC	E235.Cl	943164	1	15	6.6	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	942180	1	17	5.8	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	942323	1	20	5.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	945284	1	20	5.0	5.0	✓
Fluoride in Water by IC	E235.F	943161	1	12	8.3	5.0	✓
Nitrate in Water by IC	E235.NO3	943162	1	12	8.3	5.0	✓
Nitrite in Water by IC	E235.NO2	943165	1	12	8.3	5.0	✓
Phenols (4AAP) in Water by Colorimetry	E562	946529	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	943163	1	14	7.1	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	943964	1	15	6.6	5.0	✓
VOCs (Prairies List) by Headspace GC-MS	E611E	942144	1	4	25.0	5.0	✓

Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Conductivity in Water	E100 Edmonton - Environmental	Water	APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a water sample. Conductivity measurements are temperature-compensated to 25°C.
pH by Meter	E108 Edmonton - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
Chloride in Water by IC	E235.Cl Edmonton - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Fluoride in Water by IC	E235.F Edmonton - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrite in Water by IC	E235.NO2 Edmonton - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Water by IC	E235.NO3 Edmonton - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Sulfate in Water by IC	E235.SO4 Edmonton - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Alkalinity Species by Titration	E290 Edmonton - Environmental	Water	APHA 2320 B (mod)	Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.
Ammonia by Fluorescence	E298 Edmonton - Environmental	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318 Edmonton - Environmental	Water	Method Fialab 100, 2018	TKN in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021).

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Dissolved Organic Carbon by Combustion (Low Level)	E358-L Edmonton - Environmental	Water	APHA 5310 B (mod)	Dissolved Organic Carbon (Non-Purgeable), also known as NPOC (dissolved), is a direct measurement of DOC after a filtered (0.45 micron) sample has been acidified and purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO2. NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of DC (dissolved carbon) is comprised of IC (which is common), this method is more accurate and more reliable than the DOC by subtraction method (i.e. DC minus DIC).
Dissolved Metals in Water by CRC ICPMS	E421 Edmonton - Environmental	Water	APHA 3030B/EPA 6020B (mod)	Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by Collision/Reaction Cell ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Dissolved Mercury in Water by CVAAS	E509 Edmonton - Environmental	Water	APHA 3030B/EPA 1631E (mod)	Water samples are filtered (0.45 um), preserved with HCl, then undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.
Phenols (4AAP) in Water by Colorimetry	E562 Edmonton - Environmental	Water	EPA 9066	This automated method is based on the distillation of phenol and subsequent reaction of the distillate with alkaline ferricyanide (K3Fe(CN)6) and 4-amino-antipyrine (4-AAP) to form a red complex which is measured colorimetrically.
CCME PHC - F1 by Headspace GC-FID	E581.F1 Edmonton - Environmental	Water	CCME PHC in Soil - Tier 1	CCME Fraction 1 (F1) is analyzed by static headspace GC-FID. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
CCME PHCs - F2-F4 by GC-FID	E601 Edmonton - Environmental	Water	CCME PHC in Soil - Tier 1	Sample extracts are analyzed by GC-FID for CCME hydrocarbon fractions (F2-F4).
BTEX by Headspace GC-MS	E611A Edmonton - Environmental	Water	EPA 8260D (mod)	Volatile Organic Compounds (VOCs) are analyzed by static headspace GC-MS. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
VOCs (Prairies List) by Headspace GC-MS	E611E Edmonton - Environmental	Water	EPA 8260D (mod)	Volatile Organic Compounds (VOCs) are analyzed by static headspace GC-MS. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
Dissolved Hardness (Calculated)	EC100 Edmonton - Environmental	Water	APHA 2340B	"Hardness (as CaCO3), dissolved" is calculated from the sum of dissolved Calcium and Magnesium concentrations, expressed in CaCO3 equivalents. "Total Hardness" refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because it is a property of water due to dissolved divalent cations.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Ion Balance using Dissolved Metals	EC101 Edmonton - Environmental	Water	APHA 1030E	Cation Sum, Anion Sum, and Ion Balance are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Dissolved species are used where available. Minor ions are included where data is present. Ion Balance cannot be calculated accurately for waters with very low electrical conductivity (EC).
TDS in Water (Calculation)	EC103 Edmonton - Environmental	Water	APHA 1030E (mod)	Total Dissolved Solids is calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Dissolved species are used where available. Minor ions are included where data is present.
Nitrate and Nitrite (as N) (Calculation)	EC235.N+N Edmonton - Environmental	Water	EPA 300.0	Nitrate and Nitrite (as N) is a calculated parameter. Nitrate and Nitrite (as N) = Nitrite (as N) + Nitrate (as N).
F1-BTEX	EC580 Edmonton - Environmental	Water	CCME PHC in Soil - Tier 1	F1-BTEX is calculated as follows: F1-BTEX = F1 (C6-C10) minus benzene, toluene, ethylbenzene and xylenes (BTEX).

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 Edmonton - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Digestion for TKN in water	EP318 Edmonton - Environmental	Water	APHA 4500-Norg D (mod)	Samples are digested at high temperature using Sulfuric Acid with Copper catalyst, which converts organic nitrogen sources to Ammonia, which is then quantified by the analytical method as TKN. This method is unsuitable for samples containing high levels of nitrate. If nitrate exceeds TKN concentration by ten times or more, results may be biased low.
Preparation for Dissolved Organic Carbon for Combustion	EP358 Edmonton - Environmental	Water	APHA 5310 B (mod)	Preparation for Dissolved Organic Carbon
Dissolved Metals Water Filtration	EP421 Edmonton - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HNO3.
Dissolved Mercury Water Filtration	EP509 Edmonton - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HCl.
VOCs Preparation for Headspace Analysis	EP581 Edmonton - Environmental	Water	EPA 5021A (mod)	Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler. An aliquot of the headspace is then injected into the GC/MS-FID system.

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
PHCs and PAHs Hexane Extraction	EP601 Edmonton - Environmental	Water	EPA 3511 (mod)	Petroleum Hydrocarbons (PHCs) and Polycyclic Aromatic Hydrocarbons (PAHs) are extracted using a hexane liquid-liquid extraction.

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QUALITY CONTROL REPORT

Work Order	: **EO2303925**	Page	: 1 of 21
Client	: Tetra Tech Canada Inc.	Laboratory	: Edmonton - Environmental
Contact	: William Wood	Account Manager	: Kieran Tordoff
Address	: North Building 14940 123 Ave NW Edmonton AB Canada T5V 1B4	Address	: 9450 - 17 Avenue NW Edmonton, Alberta Canada T6N 1M9
Telephone	:	Telephone	: +1 780 413 5227
Project	: 704-SWM.SWOP04591-03	Date Samples Received	: 17-May-2023 09:04
PO	: 704-SWM.SWOP04591-02	Date Analysis Commenced	: 17-May-2023
C-O-C number	: ----	Issue Date	: 24-May-2023 20:31
Sampler	: ---- 587-986-2709		
Site	: ----		
Quote number	: EO23-EBAE100-006 (Q83988)		
No. of samples received	: 3		
No. of samples analysed	: 3		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percent Difference (RPD) and Data Quality Objectives
- Matrix Spike (MS) Report; Recovery and Data Quality Objectives
- Method Blank (MB) Report; Recovery and Data Quality Objectives
- Laboratory Control Sample (LCS) Report; Recovery and Data Quality Objectives

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	*Position*	*Laboratory Department*
Alex Drake	Lab Analyst	Edmonton Inorganics, Edmonton, Alberta
Alex Drake	Lab Analyst	Edmonton Metals, Edmonton, Alberta
Brooke Miller	Laboratory Analyst	Edmonton Inorganics, Edmonton, Alberta
Christian Murera	Lab Analyst	Edmonton Organics, Edmonton, Alberta
Dan Nguyen	Team Leader - Inorganics	Edmonton Metals, Edmonton, Alberta
Daniel Nguyen	Lab Assistant	Edmonton Metals, Edmonton, Alberta
Jing Liu	Lab Assistant	Edmonton Inorganics, Edmonton, Alberta
Ping Yeung	Team Leader - Inorganics	Edmonton Inorganics, Edmonton, Alberta
Shruti Mudliar	Lab Analyst	Edmonton Inorganics, Edmonton, Alberta
Yan Zhang	Lab Analyst	Edmonton Organics, Edmonton, Alberta

General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number = Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO = Data Quality Objective.
LOR = Limit of Reporting (detection limit).
RPD = Relative Percent Difference
# = Indicates a QC result that did not meet the ALS DQO.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test-specific).

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Physical Tests (QC Lot: 944630)											
EO2303924-008	Anonymous	pH	----	E108	0.10	pH units	7.24	7.25	0.138%	3%	----
Physical Tests (QC Lot: 944631)											
EO2303924-008	Anonymous	Conductivity	----	E100	2.0	µS/cm	1980	1980	0.00%	10%	----
Physical Tests (QC Lot: 944632)											
EO2303924-008	Anonymous	Alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	417	420	0.550%	20%	----
Anions and Nutrients (QC Lot: 943161)											
EO2303924-008	Anonymous	Fluoride	16984-48-8	E235.F	0.100	mg/L	0.121	0.121	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 943162)											
EO2303924-008	Anonymous	Nitrate (as N)	14797-55-8	E235.NO3	0.100	mg/L	0.220	0.220	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 943163)											
EO2303924-008	Anonymous	Sulfate (as SO4)	14808-79-8	E235.SO4	1.50	mg/L	44.3	44.3	0.00%	20%	----
Anions and Nutrients (QC Lot: 943164)											
EO2303924-008	Anonymous	Chloride	16887-00-6	E235.Cl	2.50	mg/L	406	406	0.00%	20%	----
Anions and Nutrients (QC Lot: 943165)											
EO2303924-008	Anonymous	Nitrite (as N)	14797-65-0	E235.NO2	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 943964)											
EO2303923-002	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	0.200	mg/L	0.977	0.858	0.119	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 946841)											
FC2301223-001	Anonymous	Ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.0642	0.0668	3.97%	20%	----
Organic / Inorganic Carbon (QC Lot: 945284)											
EO2303917-012	Anonymous	Carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	12.4	13.4	7.38%	20%	----
Dissolved Metals (QC Lot: 942180)											
EO2303918-001	Anonymous	Mercury, dissolved	7439-97-6	E509	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
Dissolved Metals (QC Lot: 942323)											
EO2303918-001	Anonymous	Aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	0.0025	0.0024	0.00003	Diff <2x LOR	----
		Antimony, dissolved	7440-36-0	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Barium, dissolved	7440-39-3	E421	0.00010	mg/L	0.00013	0.00013	0.0000004	Diff <2x LOR	----
		Beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	<0.000020	<0.000020	0	Diff <2x LOR	----
		Bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----

Sub-Matrix: **Water**

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Laboratory Duplicate (DUP) Report LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Dissolved Metals (QC Lot: 942323) - continued											
EO2303918-001	Anonymous	Boron, dissolved	7440-42-8	E421	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
		Cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
		Calcium, dissolved	7440-70-2	E421	0.050	mg/L	0.103	0.101	0.002	Diff <2x LOR	----
		Cesium, dissolved	7440-46-2	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		Chromium, dissolved	7440-47-3	E421	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		Cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Copper, dissolved	7440-50-8	E421	0.00020	mg/L	0.00082	0.00089	0.00006	Diff <2x LOR	----
		Iron, dissolved	7439-89-6	E421	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
		Lead, dissolved	7439-92-1	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		Lithium, dissolved	7439-93-2	E421	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
		Magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	0.0253	0.0251	0.0002	Diff <2x LOR	----
		Manganese, dissolved	7439-96-5	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		Nickel, dissolved	7440-02-0	E421	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		Phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
		Potassium, dissolved	7440-09-7	E421	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
		Rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		Selenium, dissolved	7782-49-2	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		Silicon, dissolved	7440-21-3	E421	0.050	mg/L	0.109	0.099	0.009	Diff <2x LOR	----
		Silver, dissolved	7440-22-4	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		Sodium, dissolved	7440-23-5	E421	0.050	mg/L	1.00	1.01	0.692%	20%	----
		Strontium, dissolved	7440-24-6	E421	0.00020	mg/L	0.00056	0.00053	0.00002	Diff <2x LOR	----
		Sulfur, dissolved	7704-34-9	E421	0.50	mg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		Thallium, dissolved	7440-28-0	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		Thorium, dissolved	7440-29-1	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Tin, dissolved	7440-31-5	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Titanium, dissolved	7440-32-6	E421	0.00030	mg/L	<0.00030	<0.00030	0	Diff <2x LOR	----
		Tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Uranium, dissolved	7440-61-1	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		Vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		Zinc, dissolved	7440-66-6	E421	0.0010	mg/L	0.0023	0.0025	0.0002	Diff <2x LOR	----
		Zirconium, dissolved	7440-67-7	E421	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
Aggregate Organics (QC Lot: 946529)											

Sub-Matrix: **Water**

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Laboratory Duplicate (DUP) Report LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Aggregate Organics (QC Lot: 946529) - continued											
FC2301232-003	Anonymous	Phenols, total (4AAP)	----	E562	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
Volatile Organic Compounds (QC Lot: 942142)											
EO2303917-023	Anonymous	Benzene	71-43-2	E611A	0.50	µg/L	<0.00050 mg/L	<0.50	0	Diff <2x LOR	----
		Ethylbenzene	100-41-4	E611A	0.50	µg/L	<0.00050 mg/L	<0.50	0	Diff <2x LOR	----
		Styrene	100-42-5	E611A	0.50	µg/L	<0.00050 mg/L	<0.50	0	Diff <2x LOR	----
		Toluene	108-88-3	E611A	0.50	µg/L	<0.00050 mg/L	<0.50	0	Diff <2x LOR	----
		Xylene, m+p-	179601-23-1	E611A	0.40	µg/L	<0.00040 mg/L	<0.40	0	Diff <2x LOR	----
		Xylene, o-	95-47-6	E611A	0.30	µg/L	<0.00030 mg/L	<0.30	0	Diff <2x LOR	----
Volatile Organic Compounds (QC Lot: 942144)											
EO2303917-023	Anonymous	Benzene	71-43-2	E611E	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Bromobenzene	108-86-1	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Bromochloromethane	74-97-5	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Bromodichloromethane	75-27-4	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Bromoform	75-25-2	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Bromomethane	74-83-9	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Butylbenzene, n-	104-51-8	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Butylbenzene, sec-	135-98-8	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Butylbenzene, tert-	98-06-6	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Carbon tetrachloride	56-23-5	E611E	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Chlorobenzene	108-90-7	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Chloroethane	75-00-3	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Chloroform	67-66-3	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Chloromethane	74-87-3	E611E	5.0	µg/L	<5.0	<5.0	0	Diff <2x LOR	----
		Chlorotoluene, 2-	95-49-8	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Chlorotoluene, 4-	106-43-4	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Cymene, p-	99-87-6	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dibromo-3-chloropropane, 1,2-	96-12-8	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dibromochloromethane	124-48-1	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dibromoethane, 1,2-	106-93-4	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dibromomethane	74-95-3	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dichlorobenzene, 1,2-	95-50-1	E611E	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Dichlorobenzene, 1,3-	541-73-1	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----

Sub-Matrix: **Water**

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Laboratory Duplicate (DUP) Report						
					LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Volatile Organic Compounds (QC Lot: 942144) - continued											
EO2303917-023	Anonymous	Dichlorobenzene, 1,4-	106-46-7	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dichlorodifluoromethane	75-71-8	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dichloroethane, 1,1-	75-34-3	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dichloroethane, 1,2-	107-06-2	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dichloroethylene, 1,1-	75-35-4	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dichloroethylene, cis-1,2-	156-59-2	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dichloroethylene, trans-1,2-	156-60-5	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dichloromethane	75-09-2	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dichloropropane, 1,2-	78-87-5	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dichloropropane, 1,3-	142-28-9	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dichloropropane, 2,2-	594-20-7	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dichloropropylene, 1,1-	563-58-6	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dichloropropylene, cis-1,3-	10061-01-5	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dichloropropylene, trans-1,3-	10061-02-6	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Ethylbenzene	100-41-4	E611E	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Hexachlorobutadiene	87-68-3	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Isopropylbenzene	98-82-8	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Methyl-tert-butyl ether [MTBE]	1634-04-4	E611E	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Propylbenzene, n-	103-65-1	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Styrene	100-42-5	E611E	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Tetrachloroethane, 1,1,1,2-	630-20-6	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Tetrachloroethane, 1,1,2,2-	79-34-5	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Tetrachloroethylene	127-18-4	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Toluene	108-88-3	E611E	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Trichlorobenzene, 1,2,3-	87-61-6	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Trichlorobenzene, 1,2,4-	120-82-1	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Trichloroethane, 1,1,1-	71-55-6	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Trichloroethane, 1,1,2-	79-00-5	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Trichloroethylene	79-01-6	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Trichlorofluoromethane	75-69-4	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Trichloropropane, 1,2,3-	96-18-4	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Trimethylbenzene, 1,2,4-	95-63-6	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Trimethylbenzene, 1,3,5-	108-67-8	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Vinyl chloride	75-01-4	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Volatile Organic Compounds (QC Lot: 942144) - continued											
EO2303917-023	Anonymous	Xylene, m+p-	179601-23-1	E611E	0.40	µg/L	<0.40	<0.40	0	Diff <2x LOR	----
		Xylene, o-	95-47-6	E611E	0.30	µg/L	<0.30	<0.30	0	Diff <2x LOR	----
Hydrocarbons (QC Lot: 942143)											
EO2303917-023	Anonymous	F1 (C6-C10)	----	E581.F1	100	µg/L	<0.10 mg/L	<100	0	Diff <2x LOR	----

Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 944631)						
Conductivity	----	E100	1	µS/cm	<1.0	----
Physical Tests (QCLot: 944632)						
Alkalinity, total (as CaCO3)	----	E290	1	mg/L	<1.0	----
Anions and Nutrients (QCLot: 943161)						
Fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 943162)						
Nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 943163)						
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 943164)						
Chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 943165)						
Nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	<0.010	----
Anions and Nutrients (QCLot: 943964)						
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	<0.050	----
Anions and Nutrients (QCLot: 946841)						
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Organic / Inorganic Carbon (QCLot: 945284)						
Carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	<0.50	----
Dissolved Metals (QCLot: 942180)						
Mercury, dissolved	7439-97-6	E509	0.000005	mg/L	<0.0000050	----
Dissolved Metals (QCLot: 942323)						
Aluminum, dissolved	7429-90-5	E421	0.001	mg/L	<0.0010	----
Antimony, dissolved	7440-36-0	E421	0.0001	mg/L	<0.00010	----
Arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	<0.00010	----
Barium, dissolved	7440-39-3	E421	0.0001	mg/L	<0.00010	----
Beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	<0.000020	----
Bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	<0.000050	----
Boron, dissolved	7440-42-8	E421	0.01	mg/L	<0.010	----
Cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	<0.0000050	----
Calcium, dissolved	7440-70-2	E421	0.05	mg/L	<0.050	----
Cesium, dissolved	7440-46-2	E421	0.00001	mg/L	<0.000010	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Dissolved Metals (QCLot: 942323) - continued						
Chromium, dissolved	7440-47-3	E421	0.0005	mg/L	<0.00050	----
Cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	<0.00010	----
Copper, dissolved	7440-50-8	E421	0.0002	mg/L	<0.00020	----
Iron, dissolved	7439-89-6	E421	0.01	mg/L	<0.010	----
Lead, dissolved	7439-92-1	E421	0.00005	mg/L	<0.000050	----
Lithium, dissolved	7439-93-2	E421	0.001	mg/L	<0.0010	----
Magnesium, dissolved	7439-95-4	E421	0.005	mg/L	<0.0050	----
Manganese, dissolved	7439-96-5	E421	0.0001	mg/L	<0.00010	----
Molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	<0.000050	----
Nickel, dissolved	7440-02-0	E421	0.0005	mg/L	<0.00050	----
Phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	<0.050	----
Potassium, dissolved	7440-09-7	E421	0.05	mg/L	<0.050	----
Rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	<0.00020	----
Selenium, dissolved	7782-49-2	E421	0.00005	mg/L	<0.000050	----
Silicon, dissolved	7440-21-3	E421	0.05	mg/L	<0.050	----
Silver, dissolved	7440-22-4	E421	0.00001	mg/L	<0.000010	----
Sodium, dissolved	7440-23-5	E421	0.05	mg/L	<0.050	----
Strontium, dissolved	7440-24-6	E421	0.0002	mg/L	<0.00020	----
Sulfur, dissolved	7704-34-9	E421	0.5	mg/L	<0.50	----
Tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	<0.00020	----
Thallium, dissolved	7440-28-0	E421	0.00001	mg/L	<0.000010	----
Thorium, dissolved	7440-29-1	E421	0.0001	mg/L	<0.00010	----
Tin, dissolved	7440-31-5	E421	0.0001	mg/L	<0.00010	----
Titanium, dissolved	7440-32-6	E421	0.0003	mg/L	<0.00030	----
Tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	<0.00010	----
Uranium, dissolved	7440-61-1	E421	0.00001	mg/L	<0.000010	----
Vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	<0.00050	----
Zinc, dissolved	7440-66-6	E421	0.001	mg/L	<0.0010	----
Zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	<0.00020	----
Aggregate Organics (QCLot: 946529)						
Phenols, total (4AAP)	----	E562	0.001	mg/L	<0.0010	----
Volatile Organic Compounds (QCLot: 942142)						
Benzene	71-43-2	E611A	0.5	µg/L	<0.50	----
Ethylbenzene	100-41-4	E611A	0.5	µg/L	<0.50	----
Styrene	100-42-5	E611A	0.5	µg/L	<0.50	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Volatile Organic Compounds (QCLot: 942142) - continued						
Toluene	108-88-3	E611A	0.5	µg/L	<0.50	----
Xylene, m+p-	179601-23-1	E611A	0.4	µg/L	<0.40	----
Xylene, o-	95-47-6	E611A	0.3	µg/L	<0.30	----
Volatile Organic Compounds (QCLot: 942144)						
Benzene	71-43-2	E611E	0.5	µg/L	<0.50	----
Bromobenzene	108-86-1	E611E	1	µg/L	<1.0	----
Bromochloromethane	74-97-5	E611E	1	µg/L	<1.0	----
Bromodichloromethane	75-27-4	E611E	1	µg/L	<1.0	----
Bromoform	75-25-2	E611E	1	µg/L	<1.0	----
Bromomethane	74-83-9	E611E	1	µg/L	<1.0	----
Butylbenzene, n-	104-51-8	E611E	1	µg/L	<1.0	----
Butylbenzene, sec-	135-98-8	E611E	1	µg/L	<1.0	----
Butylbenzene, tert-	98-06-6	E611E	1	µg/L	<1.0	----
Carbon tetrachloride	56-23-5	E611E	0.5	µg/L	<0.50	----
Chlorobenzene	108-90-7	E611E	1	µg/L	<1.0	----
Chloroethane	75-00-3	E611E	1	µg/L	<1.0	----
Chloroform	67-66-3	E611E	1	µg/L	<1.0	----
Chloromethane	74-87-3	E611E	5	µg/L	<5.0	----
Chlorotoluene, 2-	95-49-8	E611E	1	µg/L	<1.0	----
Chlorotoluene, 4-	106-43-4	E611E	1	µg/L	<1.0	----
Cymene, p-	99-87-6	E611E	1	µg/L	<1.0	----
Dibromo-3-chloropropane, 1,2-	96-12-8	E611E	1	µg/L	<1.0	----
Dibromochloromethane	124-48-1	E611E	1	µg/L	<1.0	----
Dibromoethane, 1,2-	106-93-4	E611E	1	µg/L	<1.0	----
Dibromomethane	74-95-3	E611E	1	µg/L	<1.0	----
Dichlorobenzene, 1,2-	95-50-1	E611E	0.5	µg/L	<0.50	----
Dichlorobenzene, 1,3-	541-73-1	E611E	1	µg/L	<1.0	----
Dichlorobenzene, 1,4-	106-46-7	E611E	1	µg/L	<1.0	----
Dichlorodifluoromethane	75-71-8	E611E	1	µg/L	<1.0	----
Dichloroethane, 1,1-	75-34-3	E611E	1	µg/L	<1.0	----
Dichloroethane, 1,2-	107-06-2	E611E	1	µg/L	<1.0	----
Dichloroethylene, 1,1-	75-35-4	E611E	1	µg/L	<1.0	----
Dichloroethylene, cis-1,2-	156-59-2	E611E	1	µg/L	<1.0	----
Dichloroethylene, trans-1,2-	156-60-5	E611E	1	µg/L	<1.0	----
Dichloromethane	75-09-2	E611E	1	µg/L	<1.0	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Volatile Organic Compounds (QCLot: 942144) - continued						
Dichloropropane, 1,2-	78-87-5	E611E	1	µg/L	<1.0	----
Dichloropropane, 1,3-	142-28-9	E611E	1	µg/L	<1.0	----
Dichloropropane, 2,2-	594-20-7	E611E	1	µg/L	<1.0	----
Dichloropropylene, 1,1-	563-58-6	E611E	1	µg/L	<1.0	----
Dichloropropylene, cis-1,3-	10061-01-5	E611E	1	µg/L	<1.0	----
Dichloropropylene, trans-1,3-	10061-02-6	E611E	1	µg/L	<1.0	----
Ethylbenzene	100-41-4	E611E	0.5	µg/L	<0.50	----
Hexachlorobutadiene	87-68-3	E611E	1	µg/L	<1.0	----
Isopropylbenzene	98-82-8	E611E	1	µg/L	<1.0	----
Methyl-tert-butyl ether [MTBE]	1634-04-4	E611E	0.5	µg/L	<0.50	----
Propylbenzene, n-	103-65-1	E611E	1	µg/L	<1.0	----
Styrene	100-42-5	E611E	0.5	µg/L	<0.50	----
Tetrachloroethane, 1,1,1,2-	630-20-6	E611E	1	µg/L	<1.0	----
Tetrachloroethane, 1,1,2,2-	79-34-5	E611E	1	µg/L	<1.0	----
Tetrachloroethylene	127-18-4	E611E	1	µg/L	<1.0	----
Toluene	108-88-3	E611E	0.5	µg/L	<0.50	----
Trichlorobenzene, 1,2,3-	87-61-6	E611E	1	µg/L	<1.0	----
Trichlorobenzene, 1,2,4-	120-82-1	E611E	1	µg/L	<1.0	----
Trichloroethane, 1,1,1-	71-55-6	E611E	1	µg/L	<1.0	----
Trichloroethane, 1,1,2-	79-00-5	E611E	1	µg/L	<1.0	----
Trichloroethylene	79-01-6	E611E	1	µg/L	<1.0	----
Trichlorofluoromethane	75-69-4	E611E	1	µg/L	<1.0	----
Trichloropropane, 1,2,3-	96-18-4	E611E	1	µg/L	<1.0	----
Trimethylbenzene, 1,2,4-	95-63-6	E611E	1	µg/L	<1.0	----
Trimethylbenzene, 1,3,5-	108-67-8	E611E	1	µg/L	<1.0	----
Vinyl chloride	75-01-4	E611E	1	µg/L	<1.0	----
Xylene, m+p-	179601-23-1	E611E	0.4	µg/L	<0.40	----
Xylene, o-	95-47-6	E611E	0.3	µg/L	<0.30	----
Hydrocarbons (QCLot: 942096)						
F2 (C10-C16)	----	E601	100	µg/L	<100	----
Hydrocarbons (QCLot: 942143)						
F1 (C6-C10)	----	E581.F1	100	µg/L	<100	----

Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 944630)									
pH	----	E108	----	pH units	6 pH units	101	97.0	103	----
Physical Tests (QCLot: 944631)									
Conductivity	----	E100	1	µS/cm	1412 µS/cm	93.1	90.0	110	----
Physical Tests (QCLot: 944632)									
Alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	100	85.0	115	----
Anions and Nutrients (QCLot: 943161)									
Fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	97.9	90.0	110	----
Anions and Nutrients (QCLot: 943162)									
Nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	2.5 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 943163)									
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	97.9	90.0	110	----
Anions and Nutrients (QCLot: 943164)									
Chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	98.8	90.0	110	----
Anions and Nutrients (QCLot: 943165)									
Nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	0.5 mg/L	97.0	90.0	110	----
Anions and Nutrients (QCLot: 943964)									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	99.4	75.0	125	----
Anions and Nutrients (QCLot: 946841)									
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	96.8	85.0	115	----
Organic / Inorganic Carbon (QCLot: 945284)									
Carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	94.9	80.0	120	----
Mercury, dissolved	7439-97-6	E509	0.000005	mg/L	0.0001 mg/L	94.8	80.0	120	----
Dissolved Metals (QCLot: 942323)									
Aluminum, dissolved	7429-90-5	E421	0.001	mg/L	2 mg/L	103	80.0	120	----
Antimony, dissolved	7440-36-0	E421	0.0001	mg/L	1 mg/L	94.1	80.0	120	----
Arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	1 mg/L	102	80.0	120	----
Barium, dissolved	7440-39-3	E421	0.0001	mg/L	0.25 mg/L	102	80.0	120	----
Beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	0.1 mg/L	97.7	80.0	120	----
Bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	1 mg/L	96.9	80.0	120	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report: Spike Concentration	Recovery (%) LCS	Recovery Limits (%) Low	Recovery Limits (%) High	Qualifier
Dissolved Metals (QCLot: 942323) - continued									
Boron, dissolved	7440-42-8	E421	0.01	mg/L	1 mg/L	94.3	80.0	120	----
Cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	0.1 mg/L	104	80.0	120	----
Calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	97.6	80.0	120	----
Cesium, dissolved	7440-46-2	E421	0.00001	mg/L	0.05 mg/L	97.3	80.0	120	----
Chromium, dissolved	7440-47-3	E421	0.0005	mg/L	0.25 mg/L	94.5	80.0	120	----
Cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	0.25 mg/L	97.4	80.0	120	----
Copper, dissolved	7440-50-8	E421	0.0002	mg/L	0.25 mg/L	96.5	80.0	120	----
Iron, dissolved	7439-89-6	E421	0.01	mg/L	1 mg/L	100	80.0	120	----
Lead, dissolved	7439-92-1	E421	0.00005	mg/L	0.5 mg/L	98.1	80.0	120	----
Lithium, dissolved	7439-93-2	E421	0.001	mg/L	0.25 mg/L	99.9	80.0	120	----
Magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	106	80.0	120	----
Manganese, dissolved	7439-96-5	E421	0.0001	mg/L	0.25 mg/L	98.5	80.0	120	----
Molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	0.25 mg/L	96.6	80.0	120	----
Nickel, dissolved	7440-02-0	E421	0.0005	mg/L	0.5 mg/L	96.6	80.0	120	----
Phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	10 mg/L	99.3	80.0	120	----
Potassium, dissolved	7440-09-7	E421	0.05	mg/L	50 mg/L	97.9	80.0	120	----
Rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	0.1 mg/L	106	80.0	120	----
Selenium, dissolved	7782-49-2	E421	0.00005	mg/L	1 mg/L	97.5	80.0	120	----
Silicon, dissolved	7440-21-3	E421	0.05	mg/L	10 mg/L	109	80.0	120	----
Silver, dissolved	7440-22-4	E421	0.00001	mg/L	0.1 mg/L	89.8	80.0	120	----
Sodium, dissolved	7440-23-5	E421	0.05	mg/L	50 mg/L	108	80.0	120	----
Strontium, dissolved	7440-24-6	E421	0.0002	mg/L	0.25 mg/L	99.2	80.0	120	----
Sulfur, dissolved	7704-34-9	E421	0.5	mg/L	50 mg/L	103	80.0	120	----
Tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	0.1 mg/L	97.1	80.0	120	----
Thallium, dissolved	7440-28-0	E421	0.00001	mg/L	1 mg/L	97.3	80.0	120	----
Thorium, dissolved	7440-29-1	E421	0.0001	mg/L	0.1 mg/L	89.8	80.0	120	----
Tin, dissolved	7440-31-5	E421	0.0001	mg/L	0.5 mg/L	97.9	80.0	120	----
Titanium, dissolved	7440-32-6	E421	0.0003	mg/L	0.25 mg/L	94.0	80.0	120	----
Tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	0.1 mg/L	102	80.0	120	----
Uranium, dissolved	7440-61-1	E421	0.00001	mg/L	0.005 mg/L	96.5	80.0	120	----
Vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	0.5 mg/L	97.7	80.0	120	----
Zinc, dissolved	7440-66-6	E421	0.001	mg/L	0.5 mg/L	97.4	80.0	120	----
Zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	0.1 mg/L	93.6	80.0	120	----
Aggregate Organics (QCLot: 946529)									
Phenols, total (4AAP)	----	E562	0.001	mg/L	0.02 mg/L	94.9	85.0	115	----

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Volatile Organic Compounds (QCLot: 942142)									
Benzene	71-43-2	E611A	0.5	µg/L	100 µg/L	103	70.0	130	----
Ethylbenzene	100-41-4	E611A	0.5	µg/L	100 µg/L	98.0	70.0	130	----
Styrene	100-42-5	E611A	0.5	µg/L	100 µg/L	103	70.0	130	----
Toluene	108-88-3	E611A	0.5	µg/L	100 µg/L	97.8	70.0	130	----
Xylene, m+p-	179601-23-1	E611A	0.4	µg/L	200 µg/L	102	70.0	130	----
Xylene, o-	95-47-6	E611A	0.3	µg/L	100 µg/L	102	70.0	130	----
Volatile Organic Compounds (QCLot: 942144)									
Benzene	71-43-2	E611E	0.5	µg/L	100 µg/L	103	70.0	130	----
Bromobenzene	108-86-1	E611E	1	µg/L	100 µg/L	106	70.0	130	----
Bromochloromethane	74-97-5	E611E	1	µg/L	100 µg/L	111	70.0	130	----
Bromodichloromethane	75-27-4	E611E	1	µg/L	100 µg/L	107	70.0	130	----
Bromoform	75-25-2	E611E	1	µg/L	100 µg/L	104	70.0	130	----
Bromomethane	74-83-9	E611E	1	µg/L	100 µg/L	115	60.0	140	----
Butylbenzene, n-	104-51-8	E611E	1	µg/L	100 µg/L	102	70.0	130	----
Butylbenzene, sec-	135-98-8	E611E	1	µg/L	100 µg/L	96.7	70.0	130	----
Butylbenzene, tert-	98-06-6	E611E	1	µg/L	100 µg/L	95.0	70.0	130	----
Carbon tetrachloride	56-23-5	E611E	0.5	µg/L	100 µg/L	98.6	70.0	130	----
Chlorobenzene	108-90-7	E611E	1	µg/L	100 µg/L	106	70.0	130	----
Chloroethane	75-00-3	E611E	1	µg/L	100 µg/L	98.2	60.0	140	----
Chloroform	67-66-3	E611E	1	µg/L	100 µg/L	103	70.0	130	----
Chloromethane	74-87-3	E611E	5	µg/L	100 µg/L	103	60.0	140	----
Chlorotoluene, 2-	95-49-8	E611E	1	µg/L	100 µg/L	102	70.0	130	----
Chlorotoluene, 4-	106-43-4	E611E	1	µg/L	100 µg/L	104	70.0	130	----
Cymene, p-	99-87-6	E611E	1	µg/L	100 µg/L	96.1	70.0	130	----
Dibromo-3-chloropropane, 1,2-	96-12-8	E611E	1	µg/L	100 µg/L	109	70.0	130	----
Dibromochloromethane	124-48-1	E611E	1	µg/L	100 µg/L	112	70.0	130	----
Dibromoethane, 1,2-	106-93-4	E611E	1	µg/L	100 µg/L	116	70.0	130	----
Dibromomethane	74-95-3	E611E	1	µg/L	100 µg/L	113	70.0	130	----
Dichlorobenzene, 1,2-	95-50-1	E611E	0.5	µg/L	100 µg/L	106	70.0	130	----
Dichlorobenzene, 1,3-	541-73-1	E611E	1	µg/L	100 µg/L	105	70.0	130	----
Dichlorobenzene, 1,4-	106-46-7	E611E	1	µg/L	100 µg/L	108	70.0	130	----
Dichlorodifluoromethane	75-71-8	E611E	1	µg/L	100 µg/L	104	60.0	140	----
Dichloroethane, 1,1-	75-34-3	E611E	1	µg/L	100 µg/L	113	70.0	130	----
Dichloroethane, 1,2-	107-06-2	E611E	1	µg/L	100 µg/L	118	70.0	130	----
Dichloroethylene, 1,1-	75-35-4	E611E	1	µg/L	100 µg/L	105	70.0	130	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report: Spike Concentration	Recovery (%) LCS	Recovery Limits (%) Low	Recovery Limits (%) High	Qualifier
Volatile Organic Compounds (QCLot: 942144) - continued									
Dichloroethylene, cis-1,2-	156-59-2	E611E	1	µg/L	100 µg/L	105	70.0	130	----
Dichloroethylene, trans-1,2-	156-60-5	E611E	1	µg/L	100 µg/L	104	70.0	130	----
Dichloromethane	75-09-2	E611E	1	µg/L	100 µg/L	104	70.0	130	----
Dichloropropane, 1,2-	78-87-5	E611E	1	µg/L	100 µg/L	114	70.0	130	----
Dichloropropane, 1,3-	142-28-9	E611E	1	µg/L	100 µg/L	110	70.0	130	----
Dichloropropane, 2,2-	594-20-7	E611E	1	µg/L	100 µg/L	120	70.0	130	----
Dichloropropylene, 1,1-	563-58-6	E611E	1	µg/L	100 µg/L	102	70.0	130	----
Dichloropropylene, cis-1,3-	10061-01-5	E611E	1	µg/L	100 µg/L	116	70.0	130	----
Dichloropropylene, trans-1,3-	10061-02-6	E611E	1	µg/L	100 µg/L	115	70.0	130	----
Ethylbenzene	100-41-4	E611E	0.5	µg/L	100 µg/L	98.0	70.0	130	----
Hexachlorobutadiene	87-68-3	E611E	1	µg/L	100 µg/L	97.8	70.0	130	----
Isopropylbenzene	98-82-8	E611E	1	µg/L	100 µg/L	99.7	70.0	130	----
Methyl-tert-butyl ether [MTBE]	1634-04-4	E611E	0.5	µg/L	100 µg/L	106	70.0	130	----
Propylbenzene, n-	103-65-1	E611E	1	µg/L	100 µg/L	96.6	70.0	130	----
Styrene	100-42-5	E611E	0.5	µg/L	100 µg/L	103	70.0	130	----
Tetrachloroethane, 1,1,1,2-	630-20-6	E611E	1	µg/L	100 µg/L	108	70.0	130	----
Tetrachloroethane, 1,1,2,2-	79-34-5	E611E	1	µg/L	100 µg/L	107	70.0	130	----
Tetrachloroethylene	127-18-4	E611E	1	µg/L	100 µg/L	95.5	70.0	130	----
Toluene	108-88-3	E611E	0.5	µg/L	100 µg/L	97.8	70.0	130	----
Trichlorobenzene, 1,2,3-	87-61-6	E611E	1	µg/L	100 µg/L	99.2	70.0	130	----
Trichlorobenzene, 1,2,4-	120-82-1	E611E	1	µg/L	100 µg/L	103	70.0	130	----
Trichloroethane, 1,1,1-	71-55-6	E611E	1	µg/L	100 µg/L	108	70.0	130	----
Trichloroethane, 1,1,2-	79-00-5	E611E	1	µg/L	100 µg/L	117	70.0	130	----
Trichloroethylene	79-01-6	E611E	1	µg/L	100 µg/L	100	70.0	130	----
Trichlorofluoromethane	75-69-4	E611E	1	µg/L	100 µg/L	98.3	60.0	140	----
Trichloropropane, 1,2,3-	96-18-4	E611E	1	µg/L	100 µg/L	110	70.0	130	----
Trimethylbenzene, 1,2,4-	95-63-6	E611E	1	µg/L	100 µg/L	102	70.0	130	----
Trimethylbenzene, 1,3,5-	108-67-8	E611E	1	µg/L	100 µg/L	99.6	70.0	130	----
Vinyl chloride	75-01-4	E611E	1	µg/L	100 µg/L	109	60.0	140	----
Xylene, m+p-	179601-23-1	E611E	0.4	µg/L	200 µg/L	102	70.0	130	----
Xylene, o-	95-47-6	E611E	0.3	µg/L	100 µg/L	102	70.0	130	----
Hydrocarbons (QCLot: 942096)									
F2 (C10-C16)	----	E601	100	µg/L	3850 µg/L	88.6	70.0	130	----
Hydrocarbons (QCLot: 942143)									
F1 (C6-C10)	----	E581.F1	100	µg/L	2750 µg/L	87.2	70.0	130	----

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier

Matrix Spike (MS) Report

A Matrix Spike (MS) is a randomly selected intra-laboratory replicate sample that has been fortified (spiked) with test analytes at known concentration, and processed in an identical manner to test samples. Matrix Spikes provide information regarding analyte recovery and potential matrix effects. MS DQO exceedances due to sample matrix may sometimes be unavoidable; in such cases, test results for the associated sample (or similar samples) may be subject to bias. ND – Recovery not determined, background level >= 1x spike level.

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Anions and Nutrients (QCLot: 943161)										
EO2303924-008	Anonymous	Fluoride	16984-48-8	E235.F	1.07 mg/L	1 mg/L	107	75.0	125	----
Anions and Nutrients (QCLot: 943162)										
EO2303924-008	Anonymous	Nitrate (as N)	14797-55-8	E235.NO3	2.47 mg/L	2.5 mg/L	98.7	75.0	125	----
Anions and Nutrients (QCLot: 943163)										
EO2303924-008	Anonymous	Sulfate (as SO4)	14808-79-8	E235.SO4	97.6 mg/L	100 mg/L	97.6	75.0	125	----
Anions and Nutrients (QCLot: 943164)										
EO2303924-008	Anonymous	Chloride	16887-00-6	E235.Cl	ND mg/L	100 mg/L	ND	75.0	125	----
Anions and Nutrients (QCLot: 943165)										
EO2303924-008	Anonymous	Nitrite (as N)	14797-65-0	E235.NO2	0.480 mg/L	0.5 mg/L	96.1	75.0	125	----
Anions and Nutrients (QCLot: 943964)										
EO2303925-001	MW12B	Kjeldahl nitrogen, total [TKN]	----	E318	ND mg/L	2.5 mg/L	ND	70.0	130	----
Anions and Nutrients (QCLot: 946841)										
FC2301223-001	Anonymous	Ammonia, total (as N)	7664-41-7	E298	0.108 mg/L	0.1 mg/L	108	75.0	125	----
Organic / Inorganic Carbon (QCLot: 945284)										
EO2303917-013	Anonymous	Carbon, dissolved organic [DOC]	----	E358-L	ND mg/L	5 mg/L	ND	70.0	130	----
Dissolved Metals (QCLot: 942180)										
EO2303918-002	Anonymous	Mercury, dissolved	7439-97-6	E509	0.0000892 mg/L	0.0001 mg/L	89.2	70.0	130	----
Dissolved Metals (QCLot: 942323)										
EO2303918-002	Anonymous	Aluminum, dissolved	7429-90-5	E421	0.198 mg/L	0.2 mg/L	99.2	70.0	130	----
		Antimony, dissolved	7440-36-0	E421	0.0204 mg/L	0.02 mg/L	102	70.0	130	----
		Arsenic, dissolved	7440-38-2	E421	0.0199 mg/L	0.02 mg/L	99.7	70.0	130	----
		Barium, dissolved	7440-39-3	E421	0.0202 mg/L	0.02 mg/L	101	70.0	130	----
		Beryllium, dissolved	7440-41-7	E421	0.0418 mg/L	0.04 mg/L	104	70.0	130	----
		Bismuth, dissolved	7440-69-9	E421	0.00990 mg/L	0.01 mg/L	99.0	70.0	130	----
		Boron, dissolved	7440-42-8	E421	0.098 mg/L	0.1 mg/L	98.1	70.0	130	----
		Cadmium, dissolved	7440-43-9	E421	0.00428 mg/L	0.004 mg/L	107	70.0	130	----
		Calcium, dissolved	7440-70-2	E421	ND mg/L	4 mg/L	ND	70.0	130	----
		Cesium, dissolved	7440-46-2	E421	0.00986 mg/L	0.01 mg/L	98.6	70.0	130	----
		Chromium, dissolved	7440-47-3	E421	0.0376 mg/L	0.04 mg/L	94.0	70.0	130	----

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Dissolved Metals (QCLot: 942323) - continued										
EO2303918-002	Anonymous	Cobalt, dissolved	7440-48-4	E421	0.0198 mg/L	0.02 mg/L	98.8	70.0	130	----
		Copper, dissolved	7440-50-8	E421	0.0196 mg/L	0.02 mg/L	97.8	70.0	130	----
		Iron, dissolved	7439-89-6	E421	1.98 mg/L	2 mg/L	99.0	70.0	130	----
		Lead, dissolved	7439-92-1	E421	0.0202 mg/L	0.02 mg/L	101	70.0	130	----
		Lithium, dissolved	7439-93-2	E421	0.100 mg/L	0.1 mg/L	100	70.0	130	----
		Magnesium, dissolved	7439-95-4	E421	ND mg/L	1 mg/L	ND	70.0	130	----
		Manganese, dissolved	7439-96-5	E421	0.0194 mg/L	0.02 mg/L	96.8	70.0	130	----
		Molybdenum, dissolved	7439-98-7	E421	0.0201 mg/L	0.02 mg/L	100	70.0	130	----
		Nickel, dissolved	7440-02-0	E421	0.0395 mg/L	0.04 mg/L	98.7	70.0	130	----
		Phosphorus, dissolved	7723-14-0	E421	9.64 mg/L	10 mg/L	96.4	70.0	130	----
		Potassium, dissolved	7440-09-7	E421	3.94 mg/L	4 mg/L	98.5	70.0	130	----
		Rubidium, dissolved	7440-17-7	E421	0.0206 mg/L	0.02 mg/L	103	70.0	130	----
		Selenium, dissolved	7782-49-2	E421	0.0422 mg/L	0.04 mg/L	106	70.0	130	----
		Silicon, dissolved	7440-21-3	E421	10.0 mg/L	10 mg/L	100	70.0	130	----
		Silver, dissolved	7440-22-4	E421	0.00405 mg/L	0.004 mg/L	101	70.0	130	----
		Sodium, dissolved	7440-23-5	E421	ND mg/L	2 mg/L	ND	70.0	130	----
		Strontium, dissolved	7440-24-6	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		Sulfur, dissolved	7704-34-9	E421	20.6 mg/L	20 mg/L	103	70.0	130	----
		Tellurium, dissolved	13494-80-9	E421	0.0434 mg/L	0.04 mg/L	108	70.0	130	----
		Thallium, dissolved	7440-28-0	E421	0.00403 mg/L	0.004 mg/L	101	70.0	130	----
		Thorium, dissolved	7440-29-1	E421	0.0201 mg/L	0.02 mg/L	101	70.0	130	----
		Tin, dissolved	7440-31-5	E421	0.0200 mg/L	0.02 mg/L	100	70.0	130	----
		Titanium, dissolved	7440-32-6	E421	0.0378 mg/L	0.04 mg/L	94.6	70.0	130	----
		Tungsten, dissolved	7440-33-7	E421	0.0206 mg/L	0.02 mg/L	103	70.0	130	----
		Uranium, dissolved	7440-61-1	E421	0.00394 mg/L	0.004 mg/L	98.6	70.0	130	----
		Vanadium, dissolved	7440-62-2	E421	0.0981 mg/L	0.1 mg/L	98.1	70.0	130	----
		Zinc, dissolved	7440-66-6	E421	0.404 mg/L	0.4 mg/L	101	70.0	130	----
		Zirconium, dissolved	7440-67-7	E421	0.0403 mg/L	0.04 mg/L	101	70.0	130	----
Aggregate Organics (QCLot: 946529)										
FC2301232-003	Anonymous	Phenols, total (4AAP)	----	E562	0.0209 mg/L	0.02 mg/L	104	75.0	125	----
Volatile Organic Compounds (QCLot: 942142)										
EO2303925-001	MW12B	Benzene	71-43-2	E611A	96.0 µg/L	100 µg/L	96.0	50.0	140	----
		Ethylbenzene	100-41-4	E611A	91.8 µg/L	100 µg/L	91.8	50.0	140	----
		Styrene	100-42-5	E611A	94.7 µg/L	100 µg/L	94.7	50.0	140	----
		Toluene	108-88-3	E611A	92.4 µg/L	100 µg/L	92.4	50.0	140	----

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Volatile Organic Compounds (QCLot: 942142) - continued										
EO2303925-001	MW12B	Xylene, m+p-	179601-23-1	E611A	190 µg/L	200 µg/L	94.8	50.0	140	----
		Xylene, o-	95-47-6	E611A	94.5 µg/L	100 µg/L	94.5	50.0	140	----
Volatile Organic Compounds (QCLot: 942144)										
EO2303925-001	MW12B	Benzene	71-43-2	E611E	96.0 µg/L	100 µg/L	96.0	50.0	140	----
		Bromobenzene	108-86-1	E611E	101 µg/L	100 µg/L	101	50.0	140	----
		Bromochloromethane	74-97-5	E611E	104 µg/L	100 µg/L	104	50.0	140	----
		Bromodichloromethane	75-27-4	E611E	98.4 µg/L	100 µg/L	98.4	50.0	140	----
		Bromoform	75-25-2	E611E	97.6 µg/L	100 µg/L	97.6	50.0	140	----
		Bromomethane	74-83-9	E611E	113 µg/L	100 µg/L	113	50.0	140	----
		Butylbenzene, n-	104-51-8	E611E	97.5 µg/L	100 µg/L	97.5	50.0	140	----
		Butylbenzene, sec-	135-98-8	E611E	93.4 µg/L	100 µg/L	93.4	50.0	140	----
		Butylbenzene, tert-	98-06-6	E611E	91.1 µg/L	100 µg/L	91.1	50.0	140	----
		Carbon tetrachloride	56-23-5	E611E	89.9 µg/L	100 µg/L	89.9	50.0	140	----
		Chlorobenzene	108-90-7	E611E	99.2 µg/L	100 µg/L	99.2	50.0	140	----
		Chloroethane	75-00-3	E611E	90.2 µg/L	100 µg/L	90.2	50.0	140	----
		Chloroform	67-66-3	E611E	107 µg/L	100 µg/L	107	50.0	140	----
		Chloromethane	74-87-3	E611E	109 µg/L	100 µg/L	109	50.0	140	----
		Chlorotoluene, 2-	95-49-8	E611E	96.8 µg/L	100 µg/L	96.8	50.0	140	----
		Chlorotoluene, 4-	106-43-4	E611E	100 µg/L	100 µg/L	100	50.0	140	----
		Cymene, p-	99-87-6	E611E	92.7 µg/L	100 µg/L	92.7	50.0	140	----
		Dibromo-3-chloropropane, 1,2-	96-12-8	E611E	100 µg/L	100 µg/L	100	50.0	140	----
		Dibromochloromethane	124-48-1	E611E	104 µg/L	100 µg/L	104	50.0	140	----
		Dibromoethane, 1,2-	106-93-4	E611E	109 µg/L	100 µg/L	109	50.0	140	----
		Dibromomethane	74-95-3	E611E	104 µg/L	100 µg/L	104	50.0	140	----
		Dichlorobenzene, 1,2-	95-50-1	E611E	99.8 µg/L	100 µg/L	99.8	50.0	140	----
		Dichlorobenzene, 1,3-	541-73-1	E611E	100.0 µg/L	100 µg/L	100.0	50.0	140	----
		Dichlorobenzene, 1,4-	106-46-7	E611E	101 µg/L	100 µg/L	101	50.0	140	----
		Dichlorodifluoromethane	75-71-8	E611E	124 µg/L	100 µg/L	124	50.0	140	----
		Dichloroethane, 1,1-	75-34-3	E611E	105 µg/L	100 µg/L	105	50.0	140	----
		Dichloroethane, 1,2-	107-06-2	E611E	118 µg/L	100 µg/L	118	50.0	140	----
		Dichloroethylene, 1,1-	75-35-4	E611E	98.3 µg/L	100 µg/L	98.3	50.0	140	----
		Dichloroethylene, cis-1,2-	156-59-2	E611E	92.0 µg/L	100 µg/L	92.0	50.0	140	----
		Dichloroethylene, trans-1,2-	156-60-5	E611E	96.6 µg/L	100 µg/L	96.6	50.0	140	----
		Dichloromethane	75-09-2	E611E	96.6 µg/L	100 µg/L	96.6	50.0	140	----
		Dichloropropane, 1,2-	78-87-5	E611E	107 µg/L	100 µg/L	107	50.0	140	----

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Volatile Organic Compounds (QCLot: 942144) - continued										
EO2303925-001	MW12B	Dichloropropane, 1,3-	142-28-9	E611E	104 µg/L	100 µg/L	104	50.0	140	----
		Dichloropropane, 2,2-	594-20-7	E611E	106 µg/L	100 µg/L	106	50.0	140	----
		Dichloropropylene, 1,1-	563-58-6	E611E	95.4 µg/L	100 µg/L	95.4	50.0	140	----
		Dichloropropylene, cis-1,3-	10061-01-5	E611E	103 µg/L	100 µg/L	103	50.0	140	----
		Dichloropropylene, trans-1,3-	10061-02-6	E611E	102 µg/L	100 µg/L	102	50.0	140	----
		Ethylbenzene	100-41-4	E611E	91.8 µg/L	100 µg/L	91.8	50.0	140	----
		Hexachlorobutadiene	87-68-3	E611E	94.4 µg/L	100 µg/L	94.4	50.0	140	----
		Isopropylbenzene	98-82-8	E611E	92.6 µg/L	100 µg/L	92.6	50.0	140	----
		Methyl-tert-butyl ether [MTBE]	1634-04-4	E611E	99.4 µg/L	100 µg/L	99.4	50.0	140	----
		Propylbenzene, n-	103-65-1	E611E	90.9 µg/L	100 µg/L	90.9	50.0	140	----
		Styrene	100-42-5	E611E	94.7 µg/L	100 µg/L	94.7	50.0	140	----
		Tetrachloroethane, 1,1,1,2-	630-20-6	E611E	101 µg/L	100 µg/L	101	50.0	140	----
		Tetrachloroethane, 1,1,2,2-	79-34-5	E611E	98.0 µg/L	100 µg/L	98.0	50.0	140	----
		Tetrachloroethylene	127-18-4	E611E	90.0 µg/L	100 µg/L	90.0	50.0	140	----
		Toluene	108-88-3	E611E	92.4 µg/L	100 µg/L	92.4	50.0	140	----
		Trichlorobenzene, 1,2,3-	87-61-6	E611E	93.1 µg/L	100 µg/L	93.1	50.0	140	----
		Trichlorobenzene, 1,2,4-	120-82-1	E611E	97.9 µg/L	100 µg/L	97.9	50.0	140	----
		Trichloroethane, 1,1,1-	71-55-6	E611E	98.9 µg/L	100 µg/L	98.9	50.0	140	----
		Trichloroethane, 1,1,2-	79-00-5	E611E	110 µg/L	100 µg/L	110	50.0	140	----
		Trichloroethylene	79-01-6	E611E	92.6 µg/L	100 µg/L	92.6	50.0	140	----
		Trichlorofluoromethane	75-69-4	E611E	114 µg/L	100 µg/L	114	50.0	140	----
		Trichloropropane, 1,2,3-	96-18-4	E611E	102 µg/L	100 µg/L	102	50.0	140	----
		Trimethylbenzene, 1,2,4-	95-63-6	E611E	97.8 µg/L	100 µg/L	97.8	50.0	140	----
		Trimethylbenzene, 1,3,5-	108-67-8	E611E	94.7 µg/L	100 µg/L	94.7	50.0	140	----
		Vinyl chloride	75-01-4	E611E	105 µg/L	100 µg/L	105	50.0	140	----
		Xylene, m+p-	179601-23-1	E611E	190 µg/L	200 µg/L	94.8	50.0	140	----
		Xylene, o-	95-47-6	E611E	94.5 µg/L	100 µg/L	94.5	50.0	140	----

Chain of Custody (COC) / Analytical Request Form

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

Affix ALS barcode label here (lab use only)

COC Number: 17 -

Page 1 of

Report To	Contact and company name below will appear on the final report
Company:	Tetra Tech
Contact:	William Wood
Phone:	587-986-2709
	Company address below will appear on the final report
Street:	114940-123 Ave NW
City/Province:	Edmonton AB
Postal Code:	T5V 1B4
Invoice To	Same as Report To ☐ YES ☐ NO
	Copy of Invoice with Report ☐ YES ☐ NO
Company:	Clean Harbors
Contact:	

Project Information

ALS Account # / Quote #:	EO23-EBAE100-006
Job #:	704-SWM.SWOP04591-02
PO / AFE:	704-SWM.SWOP04591-02
LSD:	
ALS Lab Work Order # (lab use only):	EO2303925

Report Format / Distribution

Select Report Format: ☑ PDF ☐ EXCEL ☑ EDD (DIGITAL)

Quality Control (QC) Report with Report ☑ YES ☐ NO

☐ Compare Results to Criteria on Report - provide details below if box checked

Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax EBA.labdata@tetratech.com

Email 2 Carl.Forkheim@tetratech.com

Email 3 William.Wood@tetratech.com

Invoice Distribution

Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax William.Wood@tetratech.com

Email 2 Carl.Forkheim@tetratech.com

Oil and Gas Required Fields (client use)

AFE/Cost Center:	PO#
Major/Minor Code:	Routing Code:
Requisitioner:	
Location:	

ALS Contact: Sampler:

Select Service Level Below - Contact your AM to confirm all E&P TATs (surcharges may apply)

Regular [R] ☑ Standard TAT if received by 3 pm - business days - no surcharges apply

PRIORITY (Business Days)		EMERGENCY	
4 day [P4-20%]	☐	1 Business day [E - 100%]	☐
3 day [P3-25%]	☐	Same Day, Weekend or Statutory holiday [E2 -200% (Laboratory opening fees may apply)]	☐
2 day [P2-50%]	☐		

Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm

For tests that can not be performed according to the service level selected, you will be contacted.

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	Routine Parameters	Dissolved Metals (including Hg)	Nutrients (TKN, Ammonia-N, DOC)	BTEX and F1-F2	Total Phenols	VOCs (full suite)	SAMPLES ON HOLD	SUSPECTED HAZARD (see Special Instructions)
	MW12B	15-May-23	13:00	Water	9	X	X	X	X	X	X		
	19MW37A	15-May-23	10:57	Water	9	X	X	X	X	X	X		
	19MW37B	15-May-23	11:15	Water	9	X	X	X	X	X	X		

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System? ☐ YES ☐ NO

Are samples for human consumption/ use? ☐ YES ☐ NO

Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)

Dissolved nutrients + Dis. Hg field filtered + preserved. Dis metals field filtered. All others preserved in field

SAMPLE C

Frozen ☐ S

Ice Packs ☐ Ice Cubes ☐ C

Cooling Initiated ☐

INITIAL COOLER TEMPERATUR

4-6

Environmental Division Edmonton

Work Order Reference

EO2303925

Telephone : +1 780 413 5227

SHIPMENT RELEASE (client use)

Released by:	Date:	Time:
William Wood	May 17, 2023	6:55

INITIAL SHIPMENT RECEPTION (lab use only)

Received by:	Date:	Time:
Rm	5/17/23	9:24

FIN

Received by:

Time:

ATURES °C

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

If any water samples are taken from a **Regulated Drinking Water (DW) System**, please submit using an **Authorized DW COC form.**

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

587-986.2709

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right partner.

CERTIFICATE OF ANALYSIS

Work Order	: **EO2304968**	Page	: 1 of 66
Client	: **Tetra Tech Canada Inc.**	Laboratory	: Edmonton - Environmental
Contact	: Carl Forkheim	Account Manager	: Kieran Tordoff
Address	: North Building 14940 123 Ave NW Edmonton AB Canada T5V 1B4	Address	: 9450 - 17 Avenue NW Edmonton AB Canada T6N 1M9
Telephone	: 403-510-7241	Telephone	: +1 780 413 5227
Project	: SWM.SWOP04591-03	Date Samples Received	: 16-Jun-2023 16:35
PO	: ----	Date Analysis Commenced	: 19-Jun-2023
C-O-C number	: ----	Issue Date	: 27-Jun-2023 16:48
Sampler	: ----		
Site	: ----		
Quote number	: EO23-EBAE100-006 (Q83988)		
No. of samples received	: 48		
No. of samples analysed	: 47		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	*Position*	*Laboratory Department*
Adrian Hilts	Lab Analyst	Metals, Edmonton, Alberta
Andrew Fox		Metals, Calgary, Alberta
Brooke Miller	Laboratory Analyst	Inorganics, Edmonton, Alberta
Elke Tabora		Inorganics, Calgary, Alberta
George Huang	Supervisor - Inorganic	Inorganics, Calgary, Alberta
George Huang	Supervisor - Inorganic	Metals, Calgary, Alberta
Harpreet Chawla	Team Leader - Inorganics	Metals, Calgary, Alberta
Jing Liu	Lab Assistant	Inorganics, Edmonton, Alberta
Kari Mulroy	Lab Supervisor - Environmental	Organics, Edmonton, Alberta
Katarzyna Glinka	Analyst	Inorganics, Calgary, Alberta
Kevin Baxter	Team Leader - Inorganics	Inorganics, Calgary, Alberta
Kevin Baxter	Team Leader - Inorganics	Metals, Calgary, Alberta
Ping Yeung	Team Leader - Inorganics	Inorganics, Edmonton, Alberta
Yan Zhang	Lab Analyst	Organics, Edmonton, Alberta

General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances
LOR: Limit of Reporting (detection limit).

Unit	*Description*
-	no units
%	percent
µg/L	micrograms per litre
µS/cm	microsiemens per centimetre
mg/L	milligrams per litre
pH units	pH units

<: less than.

>: greater than.

Surrogate: An analyte that is similar in behavior to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Qualifiers

Qualifier	*Description*
DLDS	*Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.*
DLIS	*Detection Limit Adjusted due to insufficient sample.*
DLM	*Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).*
DTC	*Dissolved concentration exceeds total. Results were confirmed by re-analysis.*
RRV	*Reported result verified by repeat analysis.*
TKNI	*TKN result may be biased low due to Nitrate interference. Nitrate-N is > 10x TKN.*

Analytical Results

Sub-Matrix: **Water**
(Matrix: **Water**)

				Client sample ID	MW-1B	MW-1C	MW-8A	MW-8B	MW-10
				Client sampling date / time	15-Jun-2023 14:15	15-Jun-2023 14:30	15-Jun-2023 13:00	15-Jun-2023 13:15	15-Jun-2023 13:20
Analyte	CAS Number	Method/Lab	LOR	Unit	EO2304968-001	EO2304968-002	EO2304968-003	EO2304968-004	EO2304968-005
					Result	Result	Result	Result	Result
Physical Tests									
Alkalinity, bicarbonate (as HCO3)	71-52-3	E290/CG	1.0	mg/L	1170	613	1240	1170	585
Alkalinity, carbonate (as CO3)	3812-32-6	E290/CG	1.0	mg/L	69.4	7.9	87.5	49.7	12.2
Alkalinity, hydroxide (as OH)	14280-30-9	E290/CG	1.0	mg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity, total (as CaCO3)	----	E290/CG	1.0	mg/L	1080	516	1160	1040	500
Conductivity	----	E100/CG	1.0	µS/cm	1840	4570	2110	5930	3440
Hardness (as CaCO3), dissolved	----	EC100/CG	0.50	mg/L	19.9	428	22.1	324	279
pH	----	E108/CG	0.10	pH units	8.90	8.35	8.97	8.67	8.43
Solids, total dissolved [TDS], calculated	----	EC103/CG	1.0	mg/L	1350	4370	1570	5670	2980
Anions and Nutrients									
Ammonia, total (as N)	7664-41-7	E298/EO	0.0050	mg/L	0.368	0.721	0.853	0.460	0.182
Chloride	16887-00-6	E235.Cl/CG	0.50	mg/L	5.53	<5.00 DLDS	6.13	50.9	68.4
Fluoride	16984-48-8	E235.F/CG	0.020	mg/L	0.856	<0.200 DLDS	0.942	0.659	0.421
Kjeldahl nitrogen, total [TKN]	----	E318/EO	0.050	mg/L	1.19	1.09	1.28	1.40	0.473
Nitrate (as N)	14797-55-8	E235.NO3/CG	0.020	mg/L	0.261	<0.200 DLDS	<0.100 DLDS	<0.400 DLDS	<0.200 DLDS
Nitrate + Nitrite (as N)	----	EC235.N+N/CG	0.0032	mg/L	0.261	<0.224	<0.112	<0.447	<0.224
Nitrite (as N)	14797-65-0	E235.NO2/CG	0.010	mg/L	<0.050 DLDS	<0.100 DLDS	<0.050 DLDS	<0.200 DLDS	<0.100 DLDS
Sulfate (as SO4)	14808-79-8	E235.SO4/CG	0.30	mg/L	139	2540	216	2990	1580
Organic / Inorganic Carbon									
Carbon, dissolved organic [DOC]	----	E358-L/CG	0.50	mg/L	7.60	12.1	13.2	18.3	10.9
Ion Balance									
Ion balance (cations/anions)	----	EC101/CG	0.010	%	95.5	106	97.8	104	102
Dissolved Metals									
Aluminum, dissolved	7429-90-5	E421/CG	0.0010	mg/L	0.0096	0.0069	0.0103	0.0741	0.0105
Antimony, dissolved	7440-36-0	E421/CG	0.00010	mg/L	<0.00050 DLDS	<0.00050 DLDS	<0.00050 DLDS	<0.00100 DLDS	<0.00050 DLDS
Arsenic, dissolved	7440-38-2	E421/CG	0.00010	mg/L	0.00144	0.00067	0.00444	0.00168	0.00090
Barium, dissolved	7440-39-3	E421/CG	0.00010	mg/L	0.0505	0.0155	0.0523	0.0120	0.0129
Beryllium, dissolved	7440-41-7	E421/CG	0.000020	mg/L	<0.000100 DLDS	<0.000100 DLDS	<0.000100 DLDS	<0.000200 DLDS	<0.000100 DLDS
Bismuth, dissolved	7440-69-9	E421/CG	0.000050	mg/L	<0.000250 DLDS	<0.000250 DLDS	<0.000250 DLDS	<0.000500 DLDS	<0.000250 DLDS

Analytical Results

Sub-Matrix: **Water**
(Matrix: **Water**)

				Client sample ID	MW-1B	MW-1C	MW-8A	MW-8B	MW-10
				Client sampling date / time	15-Jun-2023 14:15	15-Jun-2023 14:30	15-Jun-2023 13:00	15-Jun-2023 13:15	15-Jun-2023 13:20
Analyte	CAS Number	Method/Lab	LOR	Unit	EO2304968-001	EO2304968-002	EO2304968-003	EO2304968-004	EO2304968-005
					Result	Result	Result	Result	Result
Dissolved Metals									
Boron, dissolved	7440-42-8	E421/CG	0.010	mg/L	0.678	0.252	0.712	0.446	0.138
Cadmium, dissolved	7440-43-9	E421/CG	0.0000050	mg/L	0.0000410	<0.0000250 DLDS	<0.0000250 DLDS	<0.0000500 DLDS	<0.0000250 DLDS
Calcium, dissolved	7440-70-2	E421/CG	0.050	mg/L	6.58	117	7.07	64.1	67.3
Cesium, dissolved	7440-46-2	E421/CG	0.000010	mg/L	0.000050	<0.000050 DLDS	<0.000050 DLDS	<0.000100 DLDS	<0.000050 DLDS
Chromium, dissolved	7440-47-3	E421/CG	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00100 DLDS	<0.00050
Cobalt, dissolved	7440-48-4	E421/CG	0.00010	mg/L	<0.00050 DLDS	0.00058	<0.00050 DLDS	<0.00100 DLDS	<0.00050 DLDS
Copper, dissolved	7440-50-8	E421/CG	0.00020	mg/L	0.00170	<0.00100 DLDS	<0.00100 DLDS	<0.00200 DLDS	0.00120
Iron, dissolved	7439-89-6	E421/CG	0.010	mg/L	<0.050 DLDS	<0.050 DLDS	<0.050 DLDS	0.163	<0.050 DLDS
Lead, dissolved	7439-92-1	E421/CG	0.000050	mg/L	<0.000250 DLDS	<0.000250 DLDS	<0.000250 DLDS	<0.000500 DLDS	<0.000250 DLDS
Lithium, dissolved	7439-93-2	E421/CG	0.0010	mg/L	0.126	0.320	0.116	0.290	0.254
Magnesium, dissolved	7439-95-4	E421/CG	0.0050	mg/L	0.845	33.0	1.08	39.7	27.0
Manganese, dissolved	7439-96-5	E421/CG	0.00010	mg/L	0.0584	0.195	0.105	0.120	0.0892
Mercury, dissolved	7439-97-6	E509/EO	0.0000050	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Molybdenum, dissolved	7439-98-7	E421/CG	0.000050	mg/L	0.00782	0.000525	0.00914	0.00176	0.00174
Nickel, dissolved	7440-02-0	E421/CG	0.00050	mg/L	0.00684	<0.00250 DLDS	<0.00250 DLDS	<0.00500 DLDS	0.0102
Phosphorus, dissolved	7723-14-0	E421/CG	0.050	mg/L	<0.250 DLDS	<0.250 DLDS	<0.250 DLDS	<0.500 DLDS	<0.250 DLDS
Potassium, dissolved	7440-09-7	E421/CG	0.050	mg/L	2.01	6.67	2.06	6.09	4.28
Rubidium, dissolved	7440-17-7	E421/CG	0.00020	mg/L	0.00375	0.00950	0.00318	0.00629	0.00596
Selenium, dissolved	7782-49-2	E421/CG	0.000050	mg/L	<0.000250 DLDS	<0.000250 DLDS	<0.000250 DLDS	<0.000500 DLDS	<0.000250 DLDS
Silicon, dissolved	7440-21-3	E421/CG	0.050	mg/L	3.20	4.56	3.85	4.96	4.50
Silver, dissolved	7440-22-4	E421/CG	0.000010	mg/L	<0.000050 DLDS	<0.000050 DLDS	<0.000050 DLDS	<0.000100 DLDS	<0.000050 DLDS
Sodium, dissolved	7440-23-5	E421/CG	0.050	mg/L	532	1340	615	1860	915
Strontium, dissolved	7440-24-6	E421/CG	0.00020	mg/L	0.161	2.17	0.176	1.61	0.998
Sulfur, dissolved	7704-34-9	E421/CG	0.50	mg/L	51.8	993	79.4	1100	586
Tellurium, dissolved	13494-80-9	E421/CG	0.00020	mg/L	<0.00100 DLDS	<0.00100 DLDS	<0.00100 DLDS	<0.00200 DLDS	<0.00100 DLDS
Thallium, dissolved	7440-28-0	E421/CG	0.000010	mg/L	<0.000050 DLDS	<0.000050 DLDS	<0.000050 DLDS	<0.000100 DLDS	<0.000050 DLDS
Thorium, dissolved	7440-29-1	E421/CG	0.00010	mg/L	<0.00050 DLDS	<0.00050 DLDS	<0.00050 DLDS	<0.00100 DLDS	<0.00050 DLDS
Tin, dissolved	7440-31-5	E421/CG	0.00010	mg/L	<0.00050 DLDS	<0.00050 DLDS	<0.00050 DLDS	<0.00100 DLDS	<0.00050 DLDS
Titanium, dissolved	7440-32-6	E421/CG	0.00030	mg/L	<0.00150 DLDS	<0.00150 DLDS	<0.00150 DLDS	<0.00300 DLDS	<0.00150 DLDS
Tungsten, dissolved	7440-33-7	E421/CG	0.00010	mg/L	<0.00050 DLDS	<0.00050 DLDS	<0.00050 DLDS	<0.00100 DLDS	<0.00050 DLDS

Analytical Results

Sub-Matrix: Water (Matrix: Water)				Client sample ID	MW-1B	MW-1C	MW-8A	MW-8B	MW-10
				Client sampling date / time	15-Jun-2023 14:15	15-Jun-2023 14:30	15-Jun-2023 13:00	15-Jun-2023 13:15	15-Jun-2023 13:20
Analyte	CAS Number	Method/Lab	LOR	Unit	EO2304968-001	EO2304968-002	EO2304968-003	EO2304968-004	EO2304968-005
					Result	Result	Result	Result	Result
Dissolved Metals									
Uranium, dissolved	7440-61-1	E421/CG	0.000010	mg/L	0.00128	0.000086	0.000456	0.00386	0.00463
Vanadium, dissolved	7440-62-2	E421/CG	0.00050	mg/L	<0.00250 DLDS	<0.00250 DLDS	<0.00250 DLDS	<0.00500 DLDS	<0.00250 DLDS
Zinc, dissolved	7440-66-6	E421/CG	0.0010	mg/L	<0.0050 DLDS	<0.0050 DLDS	<0.0050 DLDS	<0.0100 DLDS	<0.0050 DLDS
Zirconium, dissolved	7440-67-7	E421/CG	0.00020	mg/L	<0.00100 DLDS	<0.00100 DLDS	0.00143	<0.00200 DLDS	<0.00100 DLDS
Dissolved mercury filtration location	----	EP509/EO	-	-	Field	Field	Field	Field	Field
Dissolved metals filtration location	----	EP421/CG	-	-	Field	Field	Field	Field	Field
Aggregate Organics									
Phenols, total (4AAP)	----	E562/EO	0.0010	mg/L	<0.0010	<0.0010	0.0020	<0.0010	<0.0010
Volatile Organic Compounds									
Benzene	71-43-2	E611E/EO	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50
Benzene	71-43-2	E611A/EO	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Bromobenzene	108-86-1	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Bromochloromethane	74-97-5	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Bromodichloromethane	75-27-4	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Bromoform	75-25-2	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Bromomethane	74-83-9	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Butylbenzene, n-	104-51-8	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Butylbenzene, sec-	135-98-8	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Butylbenzene, tert-	98-06-6	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Carbon tetrachloride	56-23-5	E611E/EO	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50
Chlorobenzene	108-90-7	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Chloroethane	75-00-3	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Chloroform	67-66-3	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Chloromethane	74-87-3	E611E/EO	5.0	µg/L	<5.0	<5.0	<5.0	<5.0	<5.0
Chlorotoluene, 2-	95-49-8	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Chlorotoluene, 4-	106-43-4	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Cymene, p-	99-87-6	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dibromo-3-chloropropane, 1,2-	96-12-8	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dibromochloromethane	124-48-1	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dibromoethane, 1,2-	106-93-4	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0

Analytical Results

Sub-Matrix: Water (Matrix: Water)				Client sample ID	MW-1B	MW-1C	MW-8A	MW-8B	MW-10
				Client sampling date / time	15-Jun-2023 14:15	15-Jun-2023 14:30	15-Jun-2023 13:00	15-Jun-2023 13:15	15-Jun-2023 13:20
Analyte	CAS Number	Method/Lab	LOR	Unit	EO2304968-001	EO2304968-002	EO2304968-003	EO2304968-004	EO2304968-005
					Result	Result	Result	Result	Result
Volatile Organic Compounds									
Dibromomethane	74-95-3	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichlorobenzene, 1,2-	95-50-1	E611E/EO	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50
Dichlorobenzene, 1,3-	541-73-1	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichlorobenzene, 1,4-	106-46-7	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichlorodifluoromethane	75-71-8	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloroethane, 1,1-	75-34-3	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloroethane, 1,2-	107-06-2	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloroethylene, 1,1-	75-35-4	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloroethylene, cis-1,2-	156-59-2	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloroethylene, trans-1,2-	156-60-5	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloromethane	75-09-2	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloropropane, 1,2-	78-87-5	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloropropane, 1,3-	142-28-9	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloropropane, 2,2-	594-20-7	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloropropylene, 1,1-	563-58-6	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloropropylene, cis+trans-1,3-	542-75-6	E611E/EO	1.5	µg/L	<1.5	<1.5	<1.5	<1.5	<1.5
Dichloropropylene, cis-1,3-	10061-01-5	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloropropylene, trans-1,3-	10061-02-6	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Ethylbenzene	100-41-4	E611E/EO	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50
Ethylbenzene	100-41-4	E611A/EO	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Hexachlorobutadiene	87-68-3	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Isopropylbenzene	98-82-8	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Methyl-tert-butyl ether [MTBE]	1634-04-4	E611E/EO	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50
Propylbenzene, n-	103-65-1	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Styrene	100-42-5	E611E/EO	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50
Styrene	100-42-5	E611A/EO	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Tetrachloroethane, 1,1,1,2-	630-20-6	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Tetrachloroethane, 1,1,2,2-	79-34-5	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Tetrachloroethylene	127-18-4	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Toluene	108-88-3	E611E/EO	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50

Analytical Results

Sub-Matrix: Water (Matrix: Water)				Client sample ID	MW-1B	MW-1C	MW-8A	MW-8B	MW-10
				Client sampling date / time	15-Jun-2023 14:15	15-Jun-2023 14:30	15-Jun-2023 13:00	15-Jun-2023 13:15	15-Jun-2023 13:20
Analyte	CAS Number	Method/Lab	LOR	Unit	EO2304968-001	EO2304968-002	EO2304968-003	EO2304968-004	EO2304968-005
					Result	Result	Result	Result	Result
Volatile Organic Compounds									
Toluene	108-88-3	E611A/EO	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Trichlorobenzene, 1,2,3-	87-61-6	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Trichlorobenzene, 1,2,4-	120-82-1	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Trichloroethane, 1,1,1-	71-55-6	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Trichloroethane, 1,1,2-	79-00-5	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Trichloroethylene	79-01-6	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Trichlorofluoromethane	75-69-4	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Trichloropropane, 1,2,3-	96-18-4	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Trimethylbenzene, 1,2,4-	95-63-6	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Trimethylbenzene, 1,3,5-	108-67-8	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Vinyl chloride	75-01-4	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Xylene, m+p-	179601-23-1	E611E/EO	0.40	µg/L	<0.40	<0.40	<0.40	<0.40	<0.40
Xylene, m+p-	179601-23-1	E611A/EO	0.00040	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene, o-	95-47-6	E611E/EO	0.30	µg/L	<0.30	<0.30	<0.30	<0.30	<0.30
Xylene, o-	95-47-6	E611A/EO	0.00030	mg/L	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Xylenes, total	1330-20-7	E611E/EO	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50
Xylenes, total	1330-20-7	E611A/EO	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
BTEX, total	----	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Trihalomethanes [THMs], total	----	E611E/EO	2.0	µg/L	<2.0	<2.0	<2.0	<2.0	<2.0
Hydrocarbons									
F1 (C6-C10)	----	E581.F1/EO	0.10	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (C10-C16)	----	E601/EO	0.10	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10
F1-BTEX	----	EC580/EO	0.100	mg/L	<0.100	<0.100	<0.100	<0.100	<0.100
Hydrocarbons Surrogates									
Bromobenzotrifluoride, 2- (F2-F4 surrogate)	392-83-6	E601/EO	1.0	%	97.9	96.4	99.9	95.3	102
Dichlorotoluene, 3,4-	95-75-0	E581.F1/EO	1.0	%	121	123	119	119	125
Volatile Organic Compounds Surrogates									
Bromofluorobenzene, 4-	460-00-4	E611A/EO	1.0	%	79.4	75.7	77.4	75.7	76.2
Bromofluorobenzene, 4-	460-00-4	E611E/EO	1.0	%	79.4	75.7	77.4	75.7	76.2
Difluorobenzene, 1,4-	540-36-3	E611A/EO	1.0	%	93.8	93.7	90.5	93.8	93.2

Analytical Results

Sub-Matrix: Water (Matrix: Water)				Client sample ID	MW-1B	MW-1C	MW-8A	MW-8B	MW-10
				Client sampling date / time	15-Jun-2023 14:15	15-Jun-2023 14:30	15-Jun-2023 13:00	15-Jun-2023 13:15	15-Jun-2023 13:20
Analyte	CAS Number	Method/Lab	LOR	Unit	EO2304968-001	EO2304968-002	EO2304968-003	EO2304968-004	EO2304968-005
					Result	Result	Result	Result	Result
Volatile Organic Compounds Surrogates									
Difluorobenzene, 1,4-	540-36-3	E611E/EO	1.0	%	93.8	93.7	90.5	93.8	93.2

Please refer to the General Comments section for an explanation of any result qualifiers detected.

Please refer to the Accreditation section for an explanation of analyte accreditations.

Analytical Results

Sub-Matrix: Water (Matrix: Water)				Client sample ID	MW-11	MW-18A	MW-18B	MW-19A	MW-19B
				Client sampling date / time	15-Jun-2023 14:05	15-Jun-2023 15:00	15-Jun-2023 15:15	15-Jun-2023 15:45	15-Jun-2023 16:00
Analyte	CAS Number	Method/Lab	LOR	Unit	EO2304968-006	EO2304968-007	EO2304968-008	EO2304968-009	EO2304968-010
					Result	Result	Result	Result	Result
Physical Tests									
Alkalinity, bicarbonate (as HCO3)	71-52-3	E290/CG	1.0	mg/L	836	908	344	897	918
Alkalinity, carbonate (as CO3)	3812-32-6	E290/CG	1.0	mg/L	<1.0	61.4	<1.0	47.6	77.5
Alkalinity, hydroxide (as OH)	14280-30-9	E290/CG	1.0	mg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity, total (as CaCO3)	----	E290/CG	1.0	mg/L	685	847	282	815	881
Conductivity	----	E100/CG	1.0	µS/cm	6820	1370	1790	5490	5220
Hardness (as CaCO3), dissolved	----	EC100/CG	0.50	mg/L	1650	8.58	447	244	128
pH	----	E108/CG	0.10	pH units	8.29	8.97	8.24	8.75	8.95
Solids, total dissolved [TDS], calculated	----	EC103/CG	1.0	mg/L	9260	948	1510	5090	4580
Anions and Nutrients									
Ammonia, total (as N)	7664-41-7	E298/EO	0.0050	mg/L	0.206	0.710	0.0480	1.52	0.906
Chloride	16887-00-6	E235.Cl/CG	0.50	mg/L	56.3	6.34	28.4	9.69	<5.00 DLDS
Fluoride	16984-48-8	E235.F/CG	0.020	mg/L	0.404	1.38	0.253	0.376	<0.200 DLDS
Kjeldahl nitrogen, total [TKN]	----	E318/EO	0.050	mg/L	1.53	<0.500 DLM	0.449	1.60	1.17
Nitrate (as N)	14797-55-8	E235.NO3/CG	0.020	mg/L	<0.400 DLDS	<0.020	0.119	<0.200 DLDS	<0.200 DLDS
Nitrate + Nitrite (as N)	----	EC235.N+N/CG	0.0032	mg/L	<0.447	<0.0224	0.119	<0.224	<0.224
Nitrite (as N)	14797-65-0	E235.NO2/CG	0.010	mg/L	<0.200 DLDS	<0.010	<0.050 DLDS	<0.100 DLDS	<0.100 DLDS
Sulfate (as SO4)	14808-79-8	E235.SO4/CG	0.30	mg/L	4320	<0.30	791	2770	2470
Organic / Inorganic Carbon									
Carbon, dissolved organic [DOC]	----	E358-L/CG	0.50	mg/L	33.1	9.74	7.52	8.06	7.71
Ion Balance									
Ion balance (cations/anions)	----	EC101/CG	0.010	%	191	104	104	107	99.3
Dissolved Metals									
Aluminum, dissolved	7429-90-5	E421/CG	0.0010	mg/L	0.0101	0.0020	<0.0050 DLDS	<0.0100 DLDS	<0.0100 DLDS
Antimony, dissolved	7440-36-0	E421/CG	0.00010	mg/L	<0.00100 DLDS	0.00011	<0.00050 DLDS	<0.00100 DLDS	<0.00100 DLDS
Arsenic, dissolved	7440-38-2	E421/CG	0.00010	mg/L	0.00195	0.00179	<0.00050 DLDS	<0.00100 DLDS	0.00289
Barium, dissolved	7440-39-3	E421/CG	0.00010	mg/L	0.0116	0.0918	0.0138	0.0114	0.0216
Beryllium, dissolved	7440-41-7	E421/CG	0.000020	mg/L	<0.000200 DLDS	<0.000020	<0.000100 DLDS	<0.000200 DLDS	<0.000200 DLDS
Bismuth, dissolved	7440-69-9	E421/CG	0.000050	mg/L	<0.000500 DLDS	<0.000050	<0.000250 DLDS	<0.000500 DLDS	<0.000500 DLDS
Boron, dissolved	7440-42-8	E421/CG	0.010	mg/L	0.364	0.761	0.134	0.523	0.522

Analytical Results

Sub-Matrix: Water (Matrix: Water)				Client sample ID	MW-11	MW-18A	MW-18B	MW-19A	MW-19B
				Client sampling date / time	15-Jun-2023 14:05	15-Jun-2023 15:00	15-Jun-2023 15:15	15-Jun-2023 15:45	15-Jun-2023 16:00
Analyte	CAS Number	Method/Lab	LOR	Unit	EO2304968-006	EO2304968-007	EO2304968-008	EO2304968-009	EO2304968-010
					Result	Result	Result	Result	Result
Dissolved Metals									
Cadmium, dissolved	7440-43-9	E421/CG	0.0000050	mg/L	<0.0000500 DLDS	<0.0000050	<0.0000250 DLDS	<0.0000500 DLDS	<0.0000500 DLDS
Calcium, dissolved	7440-70-2	E421/CG	0.050	mg/L	336	2.84	120	49.4	18.8
Cesium, dissolved	7440-46-2	E421/CG	0.000010	mg/L	0.000165	0.000013	<0.000050 DLDS	<0.000100 DLDS	<0.000100 DLDS
Chromium, dissolved	7440-47-3	E421/CG	0.00050	mg/L	<0.00100 DLDS	<0.00050	<0.00050	<0.00100 DLDS	<0.00100 DLDS
Cobalt, dissolved	7440-48-4	E421/CG	0.00010	mg/L	<0.00100 DLDS	0.00010	<0.00050 DLDS	<0.00100 DLDS	<0.00100 DLDS
Copper, dissolved	7440-50-8	E421/CG	0.00020	mg/L	0.00315	0.00045	0.00113	<0.00200 DLDS	<0.00200 DLDS
Iron, dissolved	7439-89-6	E421/CG	0.010	mg/L	<0.100 DLDS	0.124	<0.050 DLDS	<0.100 DLDS	<0.100 DLDS
Lead, dissolved	7439-92-1	E421/CG	0.000050	mg/L	<0.000500 DLDS	0.000160	<0.000250 DLDS	<0.000500 DLDS	<0.000500 DLDS
Lithium, dissolved	7439-93-2	E421/CG	0.0010	mg/L	1.01	0.0781	0.106	0.536	0.553
Magnesium, dissolved	7439-95-4	E421/CG	0.0050	mg/L	198	0.361	35.7	29.3	19.8
Manganese, dissolved	7439-96-5	E421/CG	0.00010	mg/L	0.0268	0.0326	0.0364	0.255	0.0365
Mercury, dissolved	7439-97-6	E509/EO	0.0000050	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Molybdenum, dissolved	7439-98-7	E421/CG	0.000050	mg/L	0.00199	0.00615	0.000561	0.00536	0.00214
Nickel, dissolved	7440-02-0	E421/CG	0.00050	mg/L	0.00987	0.00097	0.00289	<0.00500 DLDS	<0.00500 DLDS
Phosphorus, dissolved	7723-14-0	E421/CG	0.050	mg/L	<0.500 DLDS	0.118	<0.250 DLDS	<0.500 DLDS	<0.500 DLDS
Potassium, dissolved	7440-09-7	E421/CG	0.050	mg/L	15.1	1.47	3.33	8.42	8.80
Rubidium, dissolved	7440-17-7	E421/CG	0.00020	mg/L	0.0230	0.00230	0.00566	0.00785	0.00758
Selenium, dissolved	7782-49-2	E421/CG	0.000050	mg/L	0.000630	<0.000050	<0.000250 DLDS	<0.000500 DLDS	<0.000500 DLDS
Silicon, dissolved	7440-21-3	E421/CG	0.050	mg/L	9.32	3.98	5.06	4.27	4.70
Silver, dissolved	7440-22-4	E421/CG	0.000010	mg/L	<0.000100 DLDS	<0.000010	<0.000050 DLDS	<0.000100 DLDS	<0.000100 DLDS
Sodium, dissolved	7440-23-5	E421/CG	0.050	mg/L	3860	406	340	1710	1510
Strontium, dissolved	7440-24-6	E421/CG	0.00020	mg/L	6.86	0.0696	1.11	1.39	1.17
Sulfur, dissolved	7704-34-9	E421/CG	0.50	mg/L	3030	<0.50	289	1070	867
Tellurium, dissolved	13494-80-9	E421/CG	0.00020	mg/L	<0.00200 DLDS	<0.00020	<0.00100 DLDS	<0.00200 DLDS	<0.00200 DLDS
Thallium, dissolved	7440-28-0	E421/CG	0.000010	mg/L	<0.000100 DLDS	<0.000010	<0.000050 DLDS	<0.000100 DLDS	<0.000100 DLDS
Thorium, dissolved	7440-29-1	E421/CG	0.00010	mg/L	<0.00100 DLDS	0.00024	<0.00050 DLDS	<0.00100 DLDS	<0.00100 DLDS
Tin, dissolved	7440-31-5	E421/CG	0.00010	mg/L	<0.00100 DLDS	<0.00010	<0.00050 DLDS	<0.00100 DLDS	<0.00100 DLDS
Titanium, dissolved	7440-32-6	E421/CG	0.00030	mg/L	<0.00300 DLDS	<0.00030	<0.00150 DLDS	<0.00300 DLDS	<0.00300 DLDS
Tungsten, dissolved	7440-33-7	E421/CG	0.00010	mg/L	<0.00100 DLDS	0.00046	<0.00050 DLDS	<0.00100 DLDS	<0.00100 DLDS
Uranium, dissolved	7440-61-1	E421/CG	0.000010	mg/L	0.0445	0.000062	0.00288	0.00588	0.000256

Analytical Results

Sub-Matrix: Water (Matrix: Water)				Client sample ID	MW-11	MW-18A	MW-18B	MW-19A	MW-19B
				Client sampling date / time	15-Jun-2023 14:05	15-Jun-2023 15:00	15-Jun-2023 15:15	15-Jun-2023 15:45	15-Jun-2023 16:00
Analyte	CAS Number	Method/Lab	LOR	Unit	EO2304968-006	EO2304968-007	EO2304968-008	EO2304968-009	EO2304968-010
					Result	Result	Result	Result	Result
Dissolved Metals									
Vanadium, dissolved	7440-62-2	E421/CG	0.00050	mg/L	<0.00500 DLDS	<0.00050	<0.00250 DLDS	<0.00500 DLDS	<0.00500 DLDS
Zinc, dissolved	7440-66-6	E421/CG	0.0010	mg/L	0.0102	<0.0010	<0.0050 DLDS	<0.0100 DLDS	<0.0100 DLDS
Zirconium, dissolved	7440-67-7	E421/CG	0.00020	mg/L	<0.00200 DLDS	0.00084	<0.00100 DLDS	<0.00200 DLDS	<0.00200 DLDS
Dissolved mercury filtration location	----	EP509/EO	-	-	Field	Field	Field	Field	Field
Dissolved metals filtration location	----	EP421/CG	-	-	Field	Field	Field	Field	Field
Aggregate Organics									
Phenols, total (4AAP)	----	E562/EO	0.0010	mg/L	<0.0010	<0.0010	<0.0010	0.0033	<0.0010
Volatile Organic Compounds									
Benzene	71-43-2	E611E/EO	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50
Benzene	71-43-2	E611A/EO	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Bromobenzene	108-86-1	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Bromochloromethane	74-97-5	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Bromodichloromethane	75-27-4	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Bromoform	75-25-2	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Bromomethane	74-83-9	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Butylbenzene, n-	104-51-8	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Butylbenzene, sec-	135-98-8	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Butylbenzene, tert-	98-06-6	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Carbon tetrachloride	56-23-5	E611E/EO	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50
Chlorobenzene	108-90-7	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Chloroethane	75-00-3	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Chloroform	67-66-3	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Chloromethane	74-87-3	E611E/EO	5.0	µg/L	<5.0	<5.0	<5.0	<5.0	<5.0
Chlorotoluene, 2-	95-49-8	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Chlorotoluene, 4-	106-43-4	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Cymene, p-	99-87-6	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dibromo-3-chloropropane, 1,2-	96-12-8	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dibromochloromethane	124-48-1	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dibromoethane, 1,2-	106-93-4	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dibromomethane	74-95-3	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0

Analytical Results

Sub-Matrix: Water (Matrix: Water)				Client sample ID	MW-11	MW-18A	MW-18B	MW-19A	MW-19B
				Client sampling date / time	15-Jun-2023 14:05	15-Jun-2023 15:00	15-Jun-2023 15:15	15-Jun-2023 15:45	15-Jun-2023 16:00
Analyte	CAS Number	Method/Lab	LOR	Unit	EO2304968-006	EO2304968-007	EO2304968-008	EO2304968-009	EO2304968-010
					Result	Result	Result	Result	Result
Volatile Organic Compounds									
Dichlorobenzene, 1,2-	95-50-1	E611E/EO	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50
Dichlorobenzene, 1,3-	541-73-1	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichlorobenzene, 1,4-	106-46-7	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichlorodifluoromethane	75-71-8	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloroethane, 1,1-	75-34-3	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloroethane, 1,2-	107-06-2	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloroethylene, 1,1-	75-35-4	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloroethylene, cis-1,2-	156-59-2	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloroethylene, trans-1,2-	156-60-5	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloromethane	75-09-2	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloropropane, 1,2-	78-87-5	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloropropane, 1,3-	142-28-9	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloropropane, 2,2-	594-20-7	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloropropylene, 1,1-	563-58-6	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloropropylene, cis+trans-1,3-	542-75-6	E611E/EO	1.5	µg/L	<1.5	<1.5	<1.5	<1.5	<1.5
Dichloropropylene, cis-1,3-	10061-01-5	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloropropylene, trans-1,3-	10061-02-6	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Ethylbenzene	100-41-4	E611E/EO	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50
Ethylbenzene	100-41-4	E611A/EO	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Hexachlorobutadiene	87-68-3	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Isopropylbenzene	98-82-8	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Methyl-tert-butyl ether [MTBE]	1634-04-4	E611E/EO	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50
Propylbenzene, n-	103-65-1	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Styrene	100-42-5	E611E/EO	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50
Styrene	100-42-5	E611A/EO	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Tetrachloroethane, 1,1,1,2-	630-20-6	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Tetrachloroethane, 1,1,2,2-	79-34-5	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Tetrachloroethylene	127-18-4	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Toluene	108-88-3	E611E/EO	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50
Toluene	108-88-3	E611A/EO	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050

Analytical Results

Sub-Matrix: Water (Matrix: Water)				Client sample ID	MW-11	MW-18A	MW-18B	MW-19A	MW-19B
				Client sampling date / time	15-Jun-2023 14:05	15-Jun-2023 15:00	15-Jun-2023 15:15	15-Jun-2023 15:45	15-Jun-2023 16:00
Analyte	CAS Number	Method/Lab	LOR	Unit	EO2304968-006	EO2304968-007	EO2304968-008	EO2304968-009	EO2304968-010
					Result	Result	Result	Result	Result
Volatile Organic Compounds									
Trichlorobenzene, 1,2,3-	87-61-6	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Trichlorobenzene, 1,2,4-	120-82-1	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Trichloroethane, 1,1,1-	71-55-6	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Trichloroethane, 1,1,2-	79-00-5	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Trichloroethylene	79-01-6	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Trichlorofluoromethane	75-69-4	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Trichloropropane, 1,2,3-	96-18-4	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Trimethylbenzene, 1,2,4-	95-63-6	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Trimethylbenzene, 1,3,5-	108-67-8	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Vinyl chloride	75-01-4	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Xylene, m+p-	179601-23-1	E611E/EO	0.40	µg/L	<0.40	<0.40	<0.40	<0.40	<0.40
Xylene, m+p-	179601-23-1	E611A/EO	0.00040	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene, o-	95-47-6	E611E/EO	0.30	µg/L	<0.30	<0.30	<0.30	<0.30	<0.30
Xylene, o-	95-47-6	E611A/EO	0.00030	mg/L	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Xylenes, total	1330-20-7	E611E/EO	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50
Xylenes, total	1330-20-7	E611A/EO	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
BTEX, total	----	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Trihalomethanes [THMs], total	----	E611E/EO	2.0	µg/L	<2.0	<2.0	<2.0	<2.0	<2.0
Hydrocarbons									
F1 (C6-C10)	----	E581.F1/EO	0.10	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (C10-C16)	----	E601/EO	0.10	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10
F1-BTEX	----	EC580/EO	0.100	mg/L	<0.100	<0.100	<0.100	<0.100	<0.100
Hydrocarbons Surrogates									
Bromobenzotrifluoride, 2- (F2-F4 surrogate)	392-83-6	E601/EO	1.0	%	97.6	98.5	102	99.5	95.3
Dichlorotoluene, 3,4-	95-75-0	E581.F1/EO	1.0	%	121	125	127	129	122
Volatile Organic Compounds Surrogates									
Bromofluorobenzene, 4-	460-00-4	E611A/EO	1.0	%	77.6	76.8	79.6	77.4	76.1
Bromofluorobenzene, 4-	460-00-4	E611E/EO	1.0	%	77.6	76.8	79.6	77.4	76.1
Difluorobenzene, 1,4-	540-36-3	E611A/EO	1.0	%	93.7	93.8	94.3	89.2	89.4
Difluorobenzene, 1,4-	540-36-3	E611E/EO	1.0	%	93.7	93.8	94.3	89.2	89.4

Please refer to the General Comments section for an explanation of any result qualifiers detected.

Please refer to the Accreditation section for an explanation of analyte accreditations.

Analytical Results

Sub-Matrix: **Water**
(Matrix: **Water**)

				Client sample ID	MW-20A	MW-20B	MW-21A	MW-21B	MW-22A
				Client sampling date / time	15-Jun-2023 16:10	15-Jun-2023 16:15	15-Jun-2023 16:40	15-Jun-2023 16:50	16-Jun-2023 13:40
Analyte	CAS Number	Method/Lab	LOR	Unit	EO2304968-011	EO2304968-012	EO2304968-013	EO2304968-014	EO2304968-015
					Result	Result	Result	Result	Result
Physical Tests									
Alkalinity, bicarbonate (as HCO3)	71-52-3	E290/CG	1.0	mg/L	995	668	1100	886	821
Alkalinity, carbonate (as CO3)	3812-32-6	E290/CG	1.0	mg/L	44.2	<1.0	77.5	43.2	24.0
Alkalinity, hydroxide (as OH)	14280-30-9	E290/CG	1.0	mg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity, total (as CaCO3)	----	E290/CG	1.0	mg/L	889	547	1030	798	713
Conductivity	----	E100/CG	1.0	µS/cm	3450	5480	1760	2720	4410
Hardness (as CaCO3), dissolved	----	EC100/CG	0.50	mg/L	93.3	1300	12.5	89.6	104
pH	----	E108/CG	0.10	pH units	8.74	8.12	8.98	8.78	8.66
Solids, total dissolved [TDS], calculated	----	EC103/CG	1.0	mg/L	2780	5930	1230	2140	3770
Anions and Nutrients									
Ammonia, total (as N)	7664-41-7	E298/EO	0.0050	mg/L	0.502	0.0111	0.410	0.0764	0.117
Chloride	16887-00-6	E235.Cl/CG	0.50	mg/L	<5.00 DLDS	<10.0 DLDS	8.35	<2.50 DLDS	11.0
Fluoride	16984-48-8	E235.F/CG	0.020	mg/L	0.312	<0.400 DLDS	0.793	0.361	0.288
Kjeldahl nitrogen, total [TKN]	----	E318/EO	0.050	mg/L	0.840	1.13	0.791	0.248	0.621 TKNI
Nitrate (as N)	14797-55-8	E235.NO3/CG	0.020	mg/L	1.14	0.562	0.026	<0.100 DLDS	11.2
Nitrate + Nitrite (as N)	----	EC235.N+N/CG	0.0032	mg/L	1.14	0.562	0.0260	<0.112	11.2
Nitrite (as N)	14797-65-0	E235.NO2/CG	0.010	mg/L	<0.100 DLDS	<0.200 DLDS	<0.010	<0.050 DLDS	<0.100 DLDS
Sulfate (as SO4)	14808-79-8	E235.SO4/CG	0.30	mg/L	1210	3660	42.2	839	1940
Organic / Inorganic Carbon									
Carbon, dissolved organic [DOC]	----	E358-L/CG	0.50	mg/L	7.34	27.8	10.6	6.71	7.08
Ion Balance									
Ion balance (cations/anions)	----	EC101/CG	0.010	%	103	102	109	106	104
Dissolved Metals									
Aluminum, dissolved	7429-90-5	E421/CG	0.0010	mg/L	<0.0050 DLDS	<0.0100 DLDS	0.0016	<0.0050 DLDS	<0.0050 DLDS
Antimony, dissolved	7440-36-0	E421/CG	0.00010	mg/L	<0.00050 DLDS	<0.00100 DLDS	<0.00010	<0.00050 DLDS	<0.00050 DLDS
Arsenic, dissolved	7440-38-2	E421/CG	0.00010	mg/L	<0.00050 DLDS	<0.00100 DLDS	0.00458	0.00081	<0.00050 DLDS
Barium, dissolved	7440-39-3	E421/CG	0.00010	mg/L	0.0264	0.0146	0.0840	0.00899	0.00816
Beryllium, dissolved	7440-41-7	E421/CG	0.000020	mg/L	<0.000100 DLDS	<0.000200 DLDS	<0.000020	<0.000100 DLDS	<0.000100 DLDS
Bismuth, dissolved	7440-69-9	E421/CG	0.000050	mg/L	<0.000250 DLDS	<0.000500 DLDS	<0.000050	<0.000250 DLDS	<0.000250 DLDS
Boron, dissolved	7440-42-8	E421/CG	0.010	mg/L	0.724	0.285	0.828	0.344	0.892

Analytical Results

Sub-Matrix: Water (Matrix: Water)				Client sample ID	MW-20A	MW-20B	MW-21A	MW-21B	MW-22A
				Client sampling date / time	15-Jun-2023 16:10	15-Jun-2023 16:15	15-Jun-2023 16:40	15-Jun-2023 16:50	16-Jun-2023 13:40
Analyte	CAS Number	Method/Lab	LOR	Unit	EO2304968-011	EO2304968-012	EO2304968-013	EO2304968-014	EO2304968-015
					Result	Result	Result	Result	Result
Dissolved Metals									
Cadmium, dissolved	7440-43-9	E421/CG	0.0000050	mg/L	<0.0000250 DLDS	<0.0000500 DLDS	0.000134	<0.0000250 DLDS	0.000532
Calcium, dissolved	7440-70-2	E421/CG	0.050	mg/L	29.8	313	4.20	23.0	35.4
Cesium, dissolved	7440-46-2	E421/CG	0.000010	mg/L	<0.000050 DLDS	<0.000100 DLDS	0.000032	<0.000050 DLDS	0.000105
Chromium, dissolved	7440-47-3	E421/CG	0.00050	mg/L	<0.00050	0.00188	<0.00050	<0.00050	<0.00050
Cobalt, dissolved	7440-48-4	E421/CG	0.00010	mg/L	<0.00050 DLDS	<0.00100 DLDS	0.00133	<0.00050 DLDS	<0.00050 DLDS
Copper, dissolved	7440-50-8	E421/CG	0.00020	mg/L	0.00136	0.00207	0.00050	<0.00100 DLDS	0.00128
Iron, dissolved	7439-89-6	E421/CG	0.010	mg/L	<0.050 DLDS	<0.100 DLDS	0.019	<0.050 DLDS	<0.050 DLDS
Lead, dissolved	7439-92-1	E421/CG	0.000050	mg/L	<0.000250 DLDS	<0.000500 DLDS	<0.000050	<0.000250 DLDS	<0.000250 DLDS
Lithium, dissolved	7439-93-2	E421/CG	0.0010	mg/L	0.299	0.802	0.121	0.307	0.334
Magnesium, dissolved	7439-95-4	E421/CG	0.0050	mg/L	4.58	126	0.482	7.81	3.93
Manganese, dissolved	7439-96-5	E421/CG	0.00010	mg/L	0.0362	<0.00100 DLDS	0.144	0.00243	0.0866
Mercury, dissolved	7439-97-6	E509/EO	0.0000050	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Molybdenum, dissolved	7439-98-7	E421/CG	0.000050	mg/L	0.00133	0.000914	0.00623	0.000992	0.00547
Nickel, dissolved	7440-02-0	E421/CG	0.00050	mg/L	<0.00250 DLDS	<0.00500 DLDS	0.00434	<0.00250 DLDS	0.00304
Phosphorus, dissolved	7723-14-0	E421/CG	0.050	mg/L	<0.250 DLDS	<0.500 DLDS	<0.050	<0.250 DLDS	<0.250 DLDS
Potassium, dissolved	7440-09-7	E421/CG	0.050	mg/L	4.40	14.1	1.84	4.84	4.48
Rubidium, dissolved	7440-17-7	E421/CG	0.00020	mg/L	0.00684	0.0157	0.00341	0.00747	0.00830
Selenium, dissolved	7782-49-2	E421/CG	0.000050	mg/L	<0.000250 DLDS	0.0682	0.000154	<0.000250 DLDS	<0.000250 DLDS
Silicon, dissolved	7440-21-3	E421/CG	0.050	mg/L	3.21	6.10	3.43	4.18	3.02
Silver, dissolved	7440-22-4	E421/CG	0.000010	mg/L	<0.000050 DLDS	<0.000100 DLDS	<0.000010	<0.000050 DLDS	<0.000050 DLDS
Sodium, dissolved	7440-23-5	E421/CG	0.050	mg/L	974	1440	538 RRV	768	1280
Strontium, dissolved	7440-24-6	E421/CG	0.00020	mg/L	0.714	4.85	0.111	0.422	0.924
Sulfur, dissolved	7704-34-9	E421/CG	0.50	mg/L	440	1330	16.5	314	727
Tellurium, dissolved	13494-80-9	E421/CG	0.00020	mg/L	<0.00100 DLDS	<0.00200 DLDS	<0.00020	<0.00100 DLDS	<0.00100 DLDS
Thallium, dissolved	7440-28-0	E421/CG	0.000010	mg/L	<0.000050 DLDS	<0.000100 DLDS	<0.000010	<0.000050 DLDS	<0.000050 DLDS
Thorium, dissolved	7440-29-1	E421/CG	0.00010	mg/L	<0.00050 DLDS	<0.00100 DLDS	0.00016	<0.00050 DLDS	<0.00050 DLDS
Tin, dissolved	7440-31-5	E421/CG	0.00010	mg/L	<0.00050 DLDS	<0.00100 DLDS	0.00015	<0.00050 DLDS	<0.00050 DLDS
Titanium, dissolved	7440-32-6	E421/CG	0.00030	mg/L	<0.00150 DLDS	<0.00300 DLDS	<0.00030	<0.00150 DLDS	<0.00150 DLDS
Tungsten, dissolved	7440-33-7	E421/CG	0.00010	mg/L	<0.00050 DLDS	<0.00100 DLDS	0.00023	<0.00050 DLDS	<0.00050 DLDS
Uranium, dissolved	7440-61-1	E421/CG	0.000010	mg/L	0.00152	0.0533	0.00327	0.00216	0.00373

Analytical Results

Sub-Matrix: **Water**
(Matrix: **Water**)

				Client sample ID	MW-20A	MW-20B	MW-21A	MW-21B	MW-22A
				Client sampling date / time	15-Jun-2023 16:10	15-Jun-2023 16:15	15-Jun-2023 16:40	15-Jun-2023 16:50	16-Jun-2023 13:40
Analyte	CAS Number	Method/Lab	LOR	Unit	EO2304968-011	EO2304968-012	EO2304968-013	EO2304968-014	EO2304968-015
					Result	Result	Result	Result	Result
Dissolved Metals									
Vanadium, dissolved	7440-62-2	E421/CG	0.00050	mg/L	<0.00250 DLDS	<0.00500 DLDS	<0.00050	<0.00250 DLDS	<0.00250 DLDS
Zinc, dissolved	7440-66-6	E421/CG	0.0010	mg/L	<0.0050 DLDS	<0.0100 DLDS	<0.0010	<0.0050 DLDS	<0.0050 DLDS
Zirconium, dissolved	7440-67-7	E421/CG	0.00020	mg/L	<0.00100 DLDS	<0.00200 DLDS	0.00350	<0.00100 DLDS	<0.00100 DLDS
Dissolved mercury filtration location	----	EP509/EO	-	-	Field	Field	Field	Field	Field
Dissolved metals filtration location	----	EP421/CG	-	-	Field	Field	Field	Field	Field
Aggregate Organics									
Phenols, total (4AAP)	----	E562/EO	0.0010	mg/L	<0.0010	<0.0010	0.0014	0.0024	0.0024
Volatile Organic Compounds									
Benzene	71-43-2	E611E/EO	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50
Benzene	71-43-2	E611A/EO	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Bromobenzene	108-86-1	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Bromochloromethane	74-97-5	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Bromodichloromethane	75-27-4	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Bromoform	75-25-2	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Bromomethane	74-83-9	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Butylbenzene, n-	104-51-8	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Butylbenzene, sec-	135-98-8	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Butylbenzene, tert-	98-06-6	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Carbon tetrachloride	56-23-5	E611E/EO	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50
Chlorobenzene	108-90-7	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Chloroethane	75-00-3	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Chloroform	67-66-3	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Chloromethane	74-87-3	E611E/EO	5.0	µg/L	<5.0	<5.0	<5.0	<5.0	<5.0
Chlorotoluene, 2-	95-49-8	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Chlorotoluene, 4-	106-43-4	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Cymene, p-	99-87-6	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dibromo-3-chloropropane, 1,2-	96-12-8	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dibromochloromethane	124-48-1	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dibromoethane, 1,2-	106-93-4	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dibromomethane	74-95-3	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0

Analytical Results

Sub-Matrix: Water (Matrix: Water)				Client sample ID	MW-20A	MW-20B	MW-21A	MW-21B	MW-22A
				Client sampling date / time	15-Jun-2023 16:10	15-Jun-2023 16:15	15-Jun-2023 16:40	15-Jun-2023 16:50	16-Jun-2023 13:40
Analyte	CAS Number	Method/Lab	LOR	Unit	EO2304968-011	EO2304968-012	EO2304968-013	EO2304968-014	EO2304968-015
					Result	Result	Result	Result	Result
Volatile Organic Compounds									
Dichlorobenzene, 1,2-	95-50-1	E611E/EO	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50
Dichlorobenzene, 1,3-	541-73-1	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichlorobenzene, 1,4-	106-46-7	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichlorodifluoromethane	75-71-8	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloroethane, 1,1-	75-34-3	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloroethane, 1,2-	107-06-2	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloroethylene, 1,1-	75-35-4	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloroethylene, cis-1,2-	156-59-2	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloroethylene, trans-1,2-	156-60-5	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloromethane	75-09-2	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloropropane, 1,2-	78-87-5	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloropropane, 1,3-	142-28-9	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloropropane, 2,2-	594-20-7	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloropropylene, 1,1-	563-58-6	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloropropylene, cis+trans-1,3-	542-75-6	E611E/EO	1.5	µg/L	<1.5	<1.5	<1.5	<1.5	<1.5
Dichloropropylene, cis-1,3-	10061-01-5	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloropropylene, trans-1,3-	10061-02-6	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Ethylbenzene	100-41-4	E611E/EO	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50
Ethylbenzene	100-41-4	E611A/EO	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Hexachlorobutadiene	87-68-3	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Isopropylbenzene	98-82-8	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Methyl-tert-butyl ether [MTBE]	1634-04-4	E611E/EO	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50
Propylbenzene, n-	103-65-1	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Styrene	100-42-5	E611E/EO	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50
Styrene	100-42-5	E611A/EO	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Tetrachloroethane, 1,1,1,2-	630-20-6	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Tetrachloroethane, 1,1,2,2-	79-34-5	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Tetrachloroethylene	127-18-4	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Toluene	108-88-3	E611E/EO	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50
Toluene	108-88-3	E611A/EO	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050

Analytical Results

Sub-Matrix: Water (Matrix: Water)				Client sample ID	MW-20A	MW-20B	MW-21A	MW-21B	MW-22A
				Client sampling date / time	15-Jun-2023 16:10	15-Jun-2023 16:15	15-Jun-2023 16:40	15-Jun-2023 16:50	16-Jun-2023 13:40
Analyte	CAS Number	Method/Lab	LOR	Unit	EO2304968-011	EO2304968-012	EO2304968-013	EO2304968-014	EO2304968-015
					Result	Result	Result	Result	Result
Volatile Organic Compounds									
Trichlorobenzene, 1,2,3-	87-61-6	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Trichlorobenzene, 1,2,4-	120-82-1	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Trichloroethane, 1,1,1-	71-55-6	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Trichloroethane, 1,1,2-	79-00-5	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Trichloroethylene	79-01-6	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Trichlorofluoromethane	75-69-4	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Trichloropropane, 1,2,3-	96-18-4	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Trimethylbenzene, 1,2,4-	95-63-6	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Trimethylbenzene, 1,3,5-	108-67-8	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Vinyl chloride	75-01-4	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Xylene, m+p-	179601-23-1	E611E/EO	0.40	µg/L	<0.40	<0.40	<0.40	<0.40	<0.40
Xylene, m+p-	179601-23-1	E611A/EO	0.00040	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene, o-	95-47-6	E611E/EO	0.30	µg/L	<0.30	<0.30	<0.30	<0.30	<0.30
Xylene, o-	95-47-6	E611A/EO	0.00030	mg/L	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Xylenes, total	1330-20-7	E611E/EO	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50
Xylenes, total	1330-20-7	E611A/EO	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
BTEX, total	----	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Trihalomethanes [THMs], total	----	E611E/EO	2.0	µg/L	<2.0	<2.0	<2.0	<2.0	<2.0
Hydrocarbons									
F1 (C6-C10)	----	E581.F1/EO	0.10	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (C10-C16)	----	E601/EO	0.10	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10
F1-BTEX	----	EC580/EO	0.100	mg/L	<0.100	<0.100	<0.100	<0.100	<0.100
Hydrocarbons Surrogates									
Bromobenzotrifluoride, 2- (F2-F4 surrogate)	392-83-6	E601/EO	1.0	%	96.3	98.2	95.4	97.6	95.1
Dichlorotoluene, 3,4-	95-75-0	E581.F1/EO	1.0	%	94.8	119	120	128	108
Volatile Organic Compounds Surrogates									
Bromofluorobenzene, 4-	460-00-4	E611A/EO	1.0	%	74.4	76.2	73.7	74.2	76.5
Bromofluorobenzene, 4-	460-00-4	E611E/EO	1.0	%	74.4	76.2	73.7	74.2	76.5
Difluorobenzene, 1,4-	540-36-3	E611A/EO	1.0	%	92.5	89.6	91.7	92.3	93.8
Difluorobenzene, 1,4-	540-36-3	E611E/EO	1.0	%	92.5	89.6	91.7	92.3	93.8

Please refer to the General Comments section for an explanation of any result qualifiers detected.

Please refer to the Accreditation section for an explanation of analyte accreditations.

Analytical Results

Sub-Matrix: Water (Matrix: Water)				Client sample ID	MW-22B	MW-23A	MW-23B	MW-25A	MW-25B
				Client sampling date / time	16-Jun-2023 13:45	16-Jun-2023 13:20	16-Jun-2023 13:25	16-Jun-2023 13:55	16-Jun-2023 14:00
Analyte	CAS Number	Method/Lab	LOR	Unit	EO2304968-016	EO2304968-017	EO2304968-018	EO2304968-019	EO2304968-020
					Result	Result	Result	Result	Result
Physical Tests									
Alkalinity, bicarbonate (as HCO3)	71-52-3	E290/CG	1.0	mg/L	1080	1120	922	1400	918
Alkalinity, carbonate (as CO3)	3812-32-6	E290/CG	1.0	mg/L	19.3	85.4	<1.0	90.7	<1.0
Alkalinity, hydroxide (as OH)	14280-30-9	E290/CG	1.0	mg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity, total (as CaCO3)	----	E290/CG	1.0	mg/L	920	1060	756	1300	752
Conductivity	----	E100/CG	1.0	µS/cm	6610	2150	9680	2080	9270
Hardness (as CaCO3), dissolved	----	EC100/CG	0.50	mg/L	533	11.3	710	14.8	667
pH	----	E108/CG	0.10	pH units	8.45	9.04	8.26	8.99	8.21
Solids, total dissolved [TDS], calculated	----	EC103/CG	1.0	mg/L	6440	1300	8100	1380	7720
Anions and Nutrients									
Ammonia, total (as N)	7664-41-7	E298/EO	0.0050	mg/L	0.0156	0.966	0.378	1.10	0.350
Chloride	16887-00-6	E235.Cl/CG	0.50	mg/L	<10.0 DLDS	16.8	<10.0 DLDS	8.10	<10.0 DLDS
Fluoride	16984-48-8	E235.F/CG	0.020	mg/L	<0.400 DLDS	1.20	<0.400 DLDS	1.00	<0.400 DLDS
Kjeldahl nitrogen, total [TKN]	----	E318/EO	0.050	mg/L	0.364	1.45	0.735	1.18	0.618
Nitrate (as N)	14797-55-8	E235.NO3/CG	0.020	mg/L	<0.400 DLDS	<0.020	<0.400 DLDS	0.028	0.549
Nitrate + Nitrite (as N)	----	EC235.N+N/CG	0.0032	mg/L	<0.447	<0.0224	<0.447	0.0280	0.549
Nitrite (as N)	14797-65-0	E235.NO2/CG	0.010	mg/L	<0.200 DLDS	<0.010	<0.200 DLDS	<0.010	<0.200 DLDS
Sulfate (as SO4)	14808-79-8	E235.SO4/CG	0.30	mg/L	3670	57.2	4930	0.32	4660
Organic / Inorganic Carbon									
Carbon, dissolved organic [DOC]	----	E358-L/CG	0.50	mg/L	6.22	17.0	7.86	10.6	10.3
Ion Balance									
Ion balance (cations/anions)	----	EC101/CG	0.010	%	104	106	102	95.0	103
Dissolved Metals									
Aluminum, dissolved	7429-90-5	E421/CG	0.0010	mg/L	<0.0100 DLDS	0.0156	<0.0100 DLDS	0.0058	<0.0100 DLDS
Antimony, dissolved	7440-36-0	E421/CG	0.00010	mg/L	<0.00100 DLDS	<0.00050 DLDS	<0.00100 DLDS	<0.00050 DLDS	<0.00100 DLDS
Arsenic, dissolved	7440-38-2	E421/CG	0.00010	mg/L	<0.00100 DLDS	0.00672	<0.00100 DLDS	0.00339	<0.00100 DLDS
Barium, dissolved	7440-39-3	E421/CG	0.00010	mg/L	0.00641	0.0667	0.00606	0.0955	0.0119
Beryllium, dissolved	7440-41-7	E421/CG	0.000020	mg/L	<0.000200 DLDS	<0.000100 DLDS	<0.000200 DLDS	<0.000100 DLDS	<0.000200 DLDS
Bismuth, dissolved	7440-69-9	E421/CG	0.000050	mg/L	<0.000500 DLDS	<0.000250 DLDS	<0.000500 DLDS	<0.000250 DLDS	<0.000500 DLDS
Boron, dissolved	7440-42-8	E421/CG	0.010	mg/L	0.325	0.871	0.463	0.874	0.571

Analytical Results

Sub-Matrix: Water (Matrix: Water)				Client sample ID	MW-22B	MW-23A	MW-23B	MW-25A	MW-25B
				Client sampling date / time	16-Jun-2023 13:45	16-Jun-2023 13:20	16-Jun-2023 13:25	16-Jun-2023 13:55	16-Jun-2023 14:00
Analyte	CAS Number	Method/Lab	LOR	Unit	EO2304968-016	EO2304968-017	EO2304968-018	EO2304968-019	EO2304968-020
					Result	Result	Result	Result	Result
Dissolved Metals									
Cadmium, dissolved	7440-43-9	E421/CG	0.0000050	mg/L	0.0000633	0.0000268	0.0000642	<0.0000250 DLDS	<0.0000500 DLDS
Calcium, dissolved	7440-70-2	E421/CG	0.050	mg/L	113	3.61	170	5.03	182
Cesium, dissolved	7440-46-2	E421/CG	0.000010	mg/L	0.000111	<0.000050 DLDS	0.000152	<0.000050 DLDS	<0.000100 DLDS
Chromium, dissolved	7440-47-3	E421/CG	0.00050	mg/L	0.00114	<0.00050	<0.00100 DLDS	<0.00050	<0.00100 DLDS
Cobalt, dissolved	7440-48-4	E421/CG	0.00010	mg/L	<0.00100 DLDS	<0.00050 DLDS	<0.00100 DLDS	<0.00050 DLDS	<0.00100 DLDS
Copper, dissolved	7440-50-8	E421/CG	0.00020	mg/L	<0.00200 DLDS	<0.00100 DLDS	<0.00200 DLDS	<0.00100 DLDS	<0.00200 DLDS
Iron, dissolved	7439-89-6	E421/CG	0.010	mg/L	<0.100 DLDS	<0.050 DLDS	0.100	0.094	<0.100 DLDS
Lead, dissolved	7439-92-1	E421/CG	0.000050	mg/L	<0.000500 DLDS	<0.000250 DLDS	<0.000500 DLDS	<0.000250 DLDS	<0.000500 DLDS
Lithium, dissolved	7439-93-2	E421/CG	0.0010	mg/L	0.758	0.112	0.890	0.112	0.722
Magnesium, dissolved	7439-95-4	E421/CG	0.0050	mg/L	60.9	0.564	69.4	0.550	51.7
Manganese, dissolved	7439-96-5	E421/CG	0.00010	mg/L	0.00131	0.00601	0.132	0.0697	0.193
Mercury, dissolved	7439-97-6	E509/EO	0.0000050	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Molybdenum, dissolved	7439-98-7	E421/CG	0.000050	mg/L	0.000817	0.00303	<0.000500 DLDS	0.00892	0.00104
Nickel, dissolved	7440-02-0	E421/CG	0.00050	mg/L	<0.00500 DLDS	<0.00250 DLDS	<0.00500 DLDS	<0.00250 DLDS	<0.00500 DLDS
Phosphorus, dissolved	7723-14-0	E421/CG	0.050	mg/L	<0.500 DLDS	0.271 DLDS	<0.500 DLDS	<0.250 DLDS	<0.500 DLDS
Potassium, dissolved	7440-09-7	E421/CG	0.050	mg/L	10.1	1.88	12.6	1.85	11.8
Rubidium, dissolved	7440-17-7	E421/CG	0.00020	mg/L	0.0136	0.00345	0.0182	0.00308	0.0149
Selenium, dissolved	7782-49-2	E421/CG	0.000050	mg/L	0.000652	<0.000250 DLDS	<0.000500 DLDS	<0.000250 DLDS	<0.000500 DLDS
Silicon, dissolved	7440-21-3	E421/CG	0.050	mg/L	5.07	4.24	5.85	3.56	4.60
Silver, dissolved	7440-22-4	E421/CG	0.000010	mg/L	<0.000100 DLDS	<0.000050 DLDS	<0.000100 DLDS	<0.000050 DLDS	<0.000100 DLDS
Sodium, dissolved	7440-23-5	E421/CG	0.050	mg/L	2020	548	2440	565	2340
Strontium, dissolved	7440-24-6	E421/CG	0.00020	mg/L	2.65	0.127	4.14	0.131	4.46
Sulfur, dissolved	7704-34-9	E421/CG	0.50	mg/L	1380	23.2	1880	<2.50 DLDS	1780
Tellurium, dissolved	13494-80-9	E421/CG	0.00020	mg/L	<0.00200 DLDS	<0.00100 DLDS	<0.00200 DLDS	<0.00100 DLDS	<0.00200 DLDS
Thallium, dissolved	7440-28-0	E421/CG	0.000010	mg/L	<0.000100 DLDS	<0.000050 DLDS	<0.000100 DLDS	<0.000050 DLDS	<0.000100 DLDS
Thorium, dissolved	7440-29-1	E421/CG	0.00010	mg/L	<0.00100 DLDS	<0.00050 DLDS	<0.00100 DLDS	<0.00050 DLDS	<0.00100 DLDS
Tin, dissolved	7440-31-5	E421/CG	0.00010	mg/L	<0.00100 DLDS	<0.00050 DLDS	<0.00100 DLDS	<0.00050 DLDS	<0.00100 DLDS
Titanium, dissolved	7440-32-6	E421/CG	0.00030	mg/L	<0.00300 DLDS	<0.00150 DLDS	<0.00300 DLDS	<0.00150 DLDS	<0.00300 DLDS
Tungsten, dissolved	7440-33-7	E421/CG	0.00010	mg/L	<0.00100 DLDS	0.00094	<0.00100 DLDS	<0.00050 DLDS	<0.00100 DLDS
Uranium, dissolved	7440-61-1	E421/CG	0.000010	mg/L	0.00952	0.00103	0.00201	0.000719	0.000296

Analytical Results

Sub-Matrix: Water (Matrix: Water)				Client sample ID	MW-22B	MW-23A	MW-23B	MW-25A	MW-25B
				Client sampling date / time	16-Jun-2023 13:45	16-Jun-2023 13:20	16-Jun-2023 13:25	16-Jun-2023 13:55	16-Jun-2023 14:00
Analyte	CAS Number	Method/Lab	LOR	Unit	EO2304968-016	EO2304968-017	EO2304968-018	EO2304968-019	EO2304968-020
					Result	Result	Result	Result	Result
Dissolved Metals									
Vanadium, dissolved	7440-62-2	E421/CG	0.00050	mg/L	<0.00500 DLDS	<0.00250 DLDS	<0.00500 DLDS	<0.00250 DLDS	<0.00500 DLDS
Zinc, dissolved	7440-66-6	E421/CG	0.0010	mg/L	<0.0100 DLDS	<0.0050 DLDS	<0.0100 DLDS	<0.0050 DLDS	<0.0100 DLDS
Zirconium, dissolved	7440-67-7	E421/CG	0.00020	mg/L	<0.00200 DLDS	0.00214	<0.00200 DLDS	0.00299	<0.00200 DLDS
Dissolved mercury filtration location	----	EP509/EO	-	-	Field	Field	Field	Field	Field
Dissolved metals filtration location	----	EP421/CG	-	-	Field	Field	Field	Field	Field
Aggregate Organics									
Phenols, total (4AAP)	----	E562/EO	0.0010	mg/L	<0.0010	0.0056	<0.0010	0.0012	<0.0010
Volatile Organic Compounds									
Benzene	71-43-2	E611E/EO	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50
Benzene	71-43-2	E611A/EO	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Bromobenzene	108-86-1	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Bromochloromethane	74-97-5	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Bromodichloromethane	75-27-4	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Bromoform	75-25-2	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Bromomethane	74-83-9	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Butylbenzene, n-	104-51-8	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Butylbenzene, sec-	135-98-8	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Butylbenzene, tert-	98-06-6	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Carbon tetrachloride	56-23-5	E611E/EO	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50
Chlorobenzene	108-90-7	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Chloroethane	75-00-3	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Chloroform	67-66-3	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Chloromethane	74-87-3	E611E/EO	5.0	µg/L	<5.0	<5.0	<5.0	<5.0	<5.0
Chlorotoluene, 2-	95-49-8	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Chlorotoluene, 4-	106-43-4	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Cymene, p-	99-87-6	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dibromo-3-chloropropane, 1,2-	96-12-8	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dibromochloromethane	124-48-1	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dibromoethane, 1,2-	106-93-4	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dibromomethane	74-95-3	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0

Analytical Results

Sub-Matrix: Water (Matrix: Water)				Client sample ID	MW-22B	MW-23A	MW-23B	MW-25A	MW-25B
				Client sampling date / time	16-Jun-2023 13:45	16-Jun-2023 13:20	16-Jun-2023 13:25	16-Jun-2023 13:55	16-Jun-2023 14:00
Analyte	CAS Number	Method/Lab	LOR	Unit	EO2304968-016	EO2304968-017	EO2304968-018	EO2304968-019	EO2304968-020
					Result	Result	Result	Result	Result
Volatile Organic Compounds									
Dichlorobenzene, 1,2-	95-50-1	E611E/EO	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50
Dichlorobenzene, 1,3-	541-73-1	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichlorobenzene, 1,4-	106-46-7	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichlorodifluoromethane	75-71-8	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloroethane, 1,1-	75-34-3	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloroethane, 1,2-	107-06-2	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloroethylene, 1,1-	75-35-4	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloroethylene, cis-1,2-	156-59-2	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloroethylene, trans-1,2-	156-60-5	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloromethane	75-09-2	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloropropane, 1,2-	78-87-5	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloropropane, 1,3-	142-28-9	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloropropane, 2,2-	594-20-7	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloropropylene, 1,1-	563-58-6	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloropropylene, cis+trans-1,3-	542-75-6	E611E/EO	1.5	µg/L	<1.5	<1.5	<1.5	<1.5	<1.5
Dichloropropylene, cis-1,3-	10061-01-5	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloropropylene, trans-1,3-	10061-02-6	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Ethylbenzene	100-41-4	E611E/EO	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50
Ethylbenzene	100-41-4	E611A/EO	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Hexachlorobutadiene	87-68-3	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Isopropylbenzene	98-82-8	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Methyl-tert-butyl ether [MTBE]	1634-04-4	E611E/EO	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50
Propylbenzene, n-	103-65-1	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Styrene	100-42-5	E611E/EO	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50
Styrene	100-42-5	E611A/EO	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Tetrachloroethane, 1,1,1,2-	630-20-6	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Tetrachloroethane, 1,1,2,2-	79-34-5	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Tetrachloroethylene	127-18-4	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Toluene	108-88-3	E611E/EO	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50
Toluene	108-88-3	E611A/EO	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050

Analytical Results

Sub-Matrix: Water (Matrix: Water)				Client sample ID	MW-22B	MW-23A	MW-23B	MW-25A	MW-25B
				Client sampling date / time	16-Jun-2023 13:45	16-Jun-2023 13:20	16-Jun-2023 13:25	16-Jun-2023 13:55	16-Jun-2023 14:00
Analyte	CAS Number	Method/Lab	LOR	Unit	EO2304968-016	EO2304968-017	EO2304968-018	EO2304968-019	EO2304968-020
					Result	Result	Result	Result	Result
Volatile Organic Compounds									
Trichlorobenzene, 1,2,3-	87-61-6	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Trichlorobenzene, 1,2,4-	120-82-1	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Trichloroethane, 1,1,1-	71-55-6	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Trichloroethane, 1,1,2-	79-00-5	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Trichloroethylene	79-01-6	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Trichlorofluoromethane	75-69-4	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Trichloropropane, 1,2,3-	96-18-4	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Trimethylbenzene, 1,2,4-	95-63-6	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Trimethylbenzene, 1,3,5-	108-67-8	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Vinyl chloride	75-01-4	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Xylene, m+p-	179601-23-1	E611E/EO	0.40	µg/L	0.41	<0.40	<0.40	<0.40	<0.40
Xylene, m+p-	179601-23-1	E611A/EO	0.00040	mg/L	0.00041	<0.00040	<0.00040	<0.00040	<0.00040
Xylene, o-	95-47-6	E611E/EO	0.30	µg/L	<0.30	<0.30	<0.30	<0.30	<0.30
Xylene, o-	95-47-6	E611A/EO	0.00030	mg/L	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Xylenes, total	1330-20-7	E611E/EO	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50
Xylenes, total	1330-20-7	E611A/EO	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
BTEX, total	----	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Trihalomethanes [THMs], total	----	E611E/EO	2.0	µg/L	<2.0	<2.0	<2.0	<2.0	<2.0
Hydrocarbons									
F1 (C6-C10)	----	E581.F1/EO	0.10	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (C10-C16)	----	E601/EO	0.10	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10
F1-BTEX	----	EC580/EO	0.100	mg/L	<0.100	<0.100	<0.100	<0.100	<0.100
Hydrocarbons Surrogates									
Bromobenzotrifluoride, 2- (F2-F4 surrogate)	392-83-6	E601/EO	1.0	%	94.9	93.9	94.6	93.1	96.1
Dichlorotoluene, 3,4-	95-75-0	E581.F1/EO	1.0	%	122	123	127	123	130
Volatile Organic Compounds Surrogates									
Bromofluorobenzene, 4-	460-00-4	E611A/EO	1.0	%	91.3	93.8	92.3	86.2	87.1
Bromofluorobenzene, 4-	460-00-4	E611E/EO	1.0	%	91.3	93.8	92.3	86.2	87.1
Difluorobenzene, 1,4-	540-36-3	E611A/EO	1.0	%	97.9	96.6	95.9	96.6	96.7
Difluorobenzene, 1,4-	540-36-3	E611E/EO	1.0	%	97.9	96.6	95.9	96.6	96.7

Please refer to the General Comments section for an explanation of any result qualifiers detected.

Please refer to the Accreditation section for an explanation of analyte accreditations.

Analytical Results

Sub-Matrix: Water (Matrix: Water)				Client sample ID	MW-26A	MW-26B	MW-27A	MW-27B	MW-28A
				Client sampling date / time	16-Jun-2023 13:00	16-Jun-2023 13:10	16-Jun-2023 12:00	16-Jun-2023 12:10	16-Jun-2023 12:15
Analyte	CAS Number	Method/Lab	LOR	Unit	EO2304968-021	EO2304968-022	EO2304968-023	EO2304968-024	EO2304968-025
					Result	Result	Result	Result	Result
Physical Tests									
Alkalinity, bicarbonate (as HCO3)	71-52-3	E290/CG	1.0	mg/L	1000	963	829	1470	756
Alkalinity, carbonate (as CO3)	3812-32-6	E290/CG	1.0	mg/L	66.8	13.1	55.2	33.5	48.8
Alkalinity, hydroxide (as OH)	14280-30-9	E290/CG	1.0	mg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity, total (as CaCO3)	----	E290/CG	1.0	mg/L	931	811	772	1260	701
Conductivity	----	E100/CG	1.0	µS/cm	2580	7600	2830	11800	3260
Hardness (as CaCO3), dissolved	----	EC100/CG	0.50	mg/L	26.0	614	25.2	833	34.9
pH	----	E108/CG	0.10	pH units	8.96	8.38	8.94	8.48	8.89
Solids, total dissolved [TDS], calculated	----	EC103/CG	1.0	mg/L	1730	6120	1870	9680	2230
Anions and Nutrients									
Ammonia, total (as N)	7664-41-7	E298/EO	0.0050	mg/L	0.0764	0.162	0.784	0.539	1.33
Chloride	16887-00-6	E235.Cl/CG	0.50	mg/L	4.95	<10.0 DLDS	4.63	173	3.76
Fluoride	16984-48-8	E235.F/CG	0.020	mg/L	0.852	<0.400 DLDS	0.815	0.522	0.671
Kjeldahl nitrogen, total [TKN]	----	E318/EO	0.050	mg/L	0.124	0.592	1.23	1.33	1.95
Nitrate (as N)	14797-55-8	E235.NO3/CG	0.020	mg/L	0.960	0.545	0.165	<0.400 DLDS	<0.100 DLDS
Nitrate + Nitrite (as N)	----	EC235.N+N/CG	0.0032	mg/L	0.960	0.545	0.292	<0.447	<0.112
Nitrite (as N)	14797-65-0	E235.NO2/CG	0.010	mg/L	<0.050 DLDS	<0.200 DLDS	0.127	<0.200 DLDS	<0.050 DLDS
Sulfate (as SO4)	14808-79-8	E235.SO4/CG	0.30	mg/L	471	3550	692	5460	1010
Organic / Inorganic Carbon									
Carbon, dissolved organic [DOC]	----	E358-L/CG	0.50	mg/L	11.8	11.9	11.6	13.7	9.92
Ion Balance									
Ion balance (cations/anions)	----	EC101/CG	0.010	%	101	103	100	102	96.6
Dissolved Metals									
Aluminum, dissolved	7429-90-5	E421/CG	0.0010	mg/L	0.0264	<0.0100 DLDS	0.0051	<0.0200 DLDS	0.0082
Antimony, dissolved	7440-36-0	E421/CG	0.00010	mg/L	<0.00050 DLDS	<0.00100 DLDS	<0.00050 DLDS	<0.00200 DLDS	<0.00050 DLDS
Arsenic, dissolved	7440-38-2	E421/CG	0.00010	mg/L	0.00242	<0.00100 DLDS	0.00262	<0.00200 DLDS	0.00068
Barium, dissolved	7440-39-3	E421/CG	0.00010	mg/L	0.0544	0.00996	0.0146	0.00798	0.00909
Beryllium, dissolved	7440-41-7	E421/CG	0.000020	mg/L	<0.000100 DLDS	<0.000200 DLDS	<0.000100 DLDS	<0.000400 DLDS	<0.000100 DLDS
Bismuth, dissolved	7440-69-9	E421/CG	0.000050	mg/L	<0.000250 DLDS	<0.000500 DLDS	<0.000250 DLDS	<0.00100 DLDS	<0.000250 DLDS
Boron, dissolved	7440-42-8	E421/CG	0.010	mg/L	0.822	0.434	0.793	0.538	0.728

Analytical Results

Sub-Matrix: Water (Matrix: Water)				Client sample ID	MW-26A	MW-26B	MW-27A	MW-27B	MW-28A
				Client sampling date / time	16-Jun-2023 13:00	16-Jun-2023 13:10	16-Jun-2023 12:00	16-Jun-2023 12:10	16-Jun-2023 12:15
Analyte	CAS Number	Method/Lab	LOR	Unit	EO2304968-021	EO2304968-022	EO2304968-023	EO2304968-024	EO2304968-025
					Result	Result	Result	Result	Result
Dissolved Metals									
Cadmium, dissolved	7440-43-9	E421/CG	0.0000050	mg/L	<0.0000250 DLDS	<0.0000500 DLDS	<0.0000250 DLDS	<0.000100 DLDS	<0.0000250 DLDS
Calcium, dissolved	7440-70-2	E421/CG	0.050	mg/L	8.50	121	8.49	126	12.0
Cesium, dissolved	7440-46-2	E421/CG	0.000010	mg/L	<0.000050 DLDS	<0.000100 DLDS	<0.000050 DLDS	<0.000200 DLDS	0.000059
Chromium, dissolved	7440-47-3	E421/CG	0.00050	mg/L	0.00110	<0.00100 DLDS	<0.00050	<0.00200 DLDS	<0.00050
Cobalt, dissolved	7440-48-4	E421/CG	0.00010	mg/L	<0.00050 DLDS	<0.00100 DLDS	<0.00050 DLDS	<0.00200 DLDS	<0.00050 DLDS
Copper, dissolved	7440-50-8	E421/CG	0.00020	mg/L	0.00360	<0.00200 DLDS	<0.00100 DLDS	<0.00400 DLDS	<0.00100 DLDS
Iron, dissolved	7439-89-6	E421/CG	0.010	mg/L	<0.050 DLDS	<0.100 DLDS	<0.050 DLDS	<0.200 DLDS	0.235
Lead, dissolved	7439-92-1	E421/CG	0.000050	mg/L	<0.000250 DLDS	<0.000500 DLDS	<0.000250 DLDS	<0.00100 DLDS	<0.000250 DLDS
Lithium, dissolved	7439-93-2	E421/CG	0.0010	mg/L	0.151	0.477	0.139	0.564	0.159
Magnesium, dissolved	7439-95-4	E421/CG	0.0050	mg/L	1.15	75.7	0.979	126	1.20
Manganese, dissolved	7439-96-5	E421/CG	0.00010	mg/L	0.0160	0.184	0.0115	0.0416	0.0213
Mercury, dissolved	7439-97-6	E509/EO	0.0000050	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Molybdenum, dissolved	7439-98-7	E421/CG	0.000050	mg/L	0.00543	0.00160	0.00232	<0.00100 DLDS	0.00176
Nickel, dissolved	7440-02-0	E421/CG	0.00050	mg/L	<0.00250 DLDS	<0.00500 DLDS	<0.00250 DLDS	<0.0100 DLDS	<0.00250 DLDS
Phosphorus, dissolved	7723-14-0	E421/CG	0.050	mg/L	<0.250 DLDS	<0.500 DLDS	<0.250 DLDS	<1.00 DLDS	<0.250 DLDS
Potassium, dissolved	7440-09-7	E421/CG	0.050	mg/L	2.40	8.41	2.31	10.8	2.74
Rubidium, dissolved	7440-17-7	E421/CG	0.00020	mg/L	0.00347	0.00866	0.00420	0.0105	0.00452
Selenium, dissolved	7782-49-2	E421/CG	0.000050	mg/L	<0.000250 DLDS	<0.000500 DLDS	<0.000250 DLDS	<0.00100 DLDS	<0.000250 DLDS
Silicon, dissolved	7440-21-3	E421/CG	0.050	mg/L	4.29	5.13	3.88	4.88	3.97
Silver, dissolved	7440-22-4	E421/CG	0.000010	mg/L	<0.000050 DLDS	<0.000100 DLDS	<0.000050 DLDS	<0.000200 DLDS	<0.000050 DLDS
Sodium, dissolved	7440-23-5	E421/CG	0.050	mg/L	651	1850	675	3000	761
Strontium, dissolved	7440-24-6	E421/CG	0.00020	mg/L	0.207	2.64	0.220	4.14	0.314
Sulfur, dissolved	7704-34-9	E421/CG	0.50	mg/L	176	1300	244	1960	338
Tellurium, dissolved	13494-80-9	E421/CG	0.00020	mg/L	<0.00100 DLDS	<0.00200 DLDS	<0.00100 DLDS	<0.00400 DLDS	<0.00100 DLDS
Thallium, dissolved	7440-28-0	E421/CG	0.000010	mg/L	<0.000050 DLDS	<0.000100 DLDS	<0.000050 DLDS	<0.000200 DLDS	<0.000050 DLDS
Thorium, dissolved	7440-29-1	E421/CG	0.00010	mg/L	<0.00050 DLDS	<0.00100 DLDS	<0.00050 DLDS	<0.00200 DLDS	<0.00050 DLDS
Tin, dissolved	7440-31-5	E421/CG	0.00010	mg/L	<0.00050 DLDS	<0.00100 DLDS	<0.00050 DLDS	<0.00200 DLDS	<0.00050 DLDS
Titanium, dissolved	7440-32-6	E421/CG	0.00030	mg/L	<0.00150 DLDS	<0.00300 DLDS	<0.00150 DLDS	<0.00600 DLDS	<0.00150 DLDS
Tungsten, dissolved	7440-33-7	E421/CG	0.00010	mg/L	0.00057	<0.00100 DLDS	<0.00050 DLDS	<0.00200 DLDS	<0.00050 DLDS
Uranium, dissolved	7440-61-1	E421/CG	0.000010	mg/L	0.000682	0.00164	0.000547	0.00213	0.000321

Analytical Results

Sub-Matrix: Water (Matrix: Water)				Client sample ID	MW-26A	MW-26B	MW-27A	MW-27B	MW-28A
				Client sampling date / time	16-Jun-2023 13:00	16-Jun-2023 13:10	16-Jun-2023 12:00	16-Jun-2023 12:10	16-Jun-2023 12:15
Analyte	CAS Number	Method/Lab	LOR	Unit	EO2304968-021	EO2304968-022	EO2304968-023	EO2304968-024	EO2304968-025
					Result	Result	Result	Result	Result
Dissolved Metals									
Vanadium, dissolved	7440-62-2	E421/CG	0.00050	mg/L	0.00273	<0.00500 DLDS	<0.00250 DLDS	<0.0100 DLDS	<0.00250 DLDS
Zinc, dissolved	7440-66-6	E421/CG	0.0010	mg/L	<0.0050 DLDS	<0.0100 DLDS	<0.0050 DLDS	<0.0200 DLDS	<0.0050 DLDS
Zirconium, dissolved	7440-67-7	E421/CG	0.00020	mg/L	0.00106	<0.00200 DLDS	<0.00100 DLDS	<0.00400 DLDS	<0.00100 DLDS
Dissolved mercury filtration location	----	EP509/EO	-	-	Field	Field	Field	Field	Field
Dissolved metals filtration location	----	EP421/CG	-	-	Field	Field	Field	Field	Field
Aggregate Organics									
Phenols, total (4AAP)	----	E562/EO	0.0010	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Volatile Organic Compounds									
Benzene	71-43-2	E611E/EO	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50
Benzene	71-43-2	E611A/EO	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Bromobenzene	108-86-1	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Bromochloromethane	74-97-5	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Bromodichloromethane	75-27-4	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Bromoform	75-25-2	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Bromomethane	74-83-9	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Butylbenzene, n-	104-51-8	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Butylbenzene, sec-	135-98-8	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Butylbenzene, tert-	98-06-6	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Carbon tetrachloride	56-23-5	E611E/EO	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50
Chlorobenzene	108-90-7	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Chloroethane	75-00-3	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Chloroform	67-66-3	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Chloromethane	74-87-3	E611E/EO	5.0	µg/L	<5.0	<5.0	<5.0	<5.0	<5.0
Chlorotoluene, 2-	95-49-8	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Chlorotoluene, 4-	106-43-4	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Cymene, p-	99-87-6	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dibromo-3-chloropropane, 1,2-	96-12-8	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dibromochloromethane	124-48-1	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dibromoethane, 1,2-	106-93-4	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dibromomethane	74-95-3	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0

Analytical Results

Sub-Matrix: Water (Matrix: Water)				Client sample ID	MW-26A	MW-26B	MW-27A	MW-27B	MW-28A
				Client sampling date / time	16-Jun-2023 13:00	16-Jun-2023 13:10	16-Jun-2023 12:00	16-Jun-2023 12:10	16-Jun-2023 12:15
Analyte	CAS Number	Method/Lab	LOR	Unit	EO2304968-021	EO2304968-022	EO2304968-023	EO2304968-024	EO2304968-025
					Result	Result	Result	Result	Result
Volatile Organic Compounds									
Dichlorobenzene, 1,2-	95-50-1	E611E/EO	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50
Dichlorobenzene, 1,3-	541-73-1	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichlorobenzene, 1,4-	106-46-7	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichlorodifluoromethane	75-71-8	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloroethane, 1,1-	75-34-3	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloroethane, 1,2-	107-06-2	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloroethylene, 1,1-	75-35-4	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloroethylene, cis-1,2-	156-59-2	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloroethylene, trans-1,2-	156-60-5	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloromethane	75-09-2	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloropropane, 1,2-	78-87-5	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloropropane, 1,3-	142-28-9	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloropropane, 2,2-	594-20-7	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloropropylene, 1,1-	563-58-6	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloropropylene, cis+trans-1,3-	542-75-6	E611E/EO	1.5	µg/L	<1.5	<1.5	<1.5	<1.5	<1.5
Dichloropropylene, cis-1,3-	10061-01-5	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloropropylene, trans-1,3-	10061-02-6	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Ethylbenzene	100-41-4	E611E/EO	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50
Ethylbenzene	100-41-4	E611A/EO	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Hexachlorobutadiene	87-68-3	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Isopropylbenzene	98-82-8	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Methyl-tert-butyl ether [MTBE]	1634-04-4	E611E/EO	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50
Propylbenzene, n-	103-65-1	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Styrene	100-42-5	E611E/EO	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50
Styrene	100-42-5	E611A/EO	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Tetrachloroethane, 1,1,1,2-	630-20-6	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Tetrachloroethane, 1,1,2,2-	79-34-5	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Tetrachloroethylene	127-18-4	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Toluene	108-88-3	E611E/EO	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50
Toluene	108-88-3	E611A/EO	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050

Analytical Results

Sub-Matrix: Water (Matrix: Water)				Client sample ID	MW-26A	MW-26B	MW-27A	MW-27B	MW-28A
				Client sampling date / time	16-Jun-2023 13:00	16-Jun-2023 13:10	16-Jun-2023 12:00	16-Jun-2023 12:10	16-Jun-2023 12:15
Analyte	CAS Number	Method/Lab	LOR	Unit	EO2304968-021	EO2304968-022	EO2304968-023	EO2304968-024	EO2304968-025
					Result	Result	Result	Result	Result
Volatile Organic Compounds									
Trichlorobenzene, 1,2,3-	87-61-6	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Trichlorobenzene, 1,2,4-	120-82-1	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Trichloroethane, 1,1,1-	71-55-6	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Trichloroethane, 1,1,2-	79-00-5	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Trichloroethylene	79-01-6	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Trichlorofluoromethane	75-69-4	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Trichloropropane, 1,2,3-	96-18-4	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Trimethylbenzene, 1,2,4-	95-63-6	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Trimethylbenzene, 1,3,5-	108-67-8	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Vinyl chloride	75-01-4	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Xylene, m+p-	179601-23-1	E611E/EO	0.40	µg/L	<0.40	<0.40	<0.40	<0.40	<0.40
Xylene, m+p-	179601-23-1	E611A/EO	0.00040	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene, o-	95-47-6	E611E/EO	0.30	µg/L	<0.30	<0.30	<0.30	<0.30	<0.30
Xylene, o-	95-47-6	E611A/EO	0.00030	mg/L	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Xylenes, total	1330-20-7	E611E/EO	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50
Xylenes, total	1330-20-7	E611A/EO	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
BTEX, total	----	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Trihalomethanes [THMs], total	----	E611E/EO	2.0	µg/L	<2.0	<2.0	<2.0	<2.0	<2.0
Hydrocarbons									
F1 (C6-C10)	----	E581.F1/EO	0.10	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (C10-C16)	----	E601/EO	0.10	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10
F1-BTEX	----	EC580/EO	0.100	mg/L	<0.100	<0.100	<0.100	<0.100	<0.100
Hydrocarbons Surrogates									
Bromobenzotrifluoride, 2- (F2-F4 surrogate)	392-83-6	E601/EO	1.0	%	94.2	95.5	97.2	98.3	97.8
Dichlorotoluene, 3,4-	95-75-0	E581.F1/EO	1.0	%	122	126	123	110	125
Volatile Organic Compounds Surrogates									
Bromofluorobenzene, 4-	460-00-4	E611A/EO	1.0	%	88.9	86.7	85.8	83.9	84.5
Bromofluorobenzene, 4-	460-00-4	E611E/EO	1.0	%	88.9	86.7	85.8	83.9	84.5
Difluorobenzene, 1,4-	540-36-3	E611A/EO	1.0	%	97.2	96.8	96.9	95.1	93.5
Difluorobenzene, 1,4-	540-36-3	E611E/EO	1.0	%	97.2	96.8	96.9	95.1	93.5

Please refer to the General Comments section for an explanation of any result qualifiers detected.

Please refer to the Accreditation section for an explanation of analyte accreditations.

Analytical Results

Sub-Matrix: Water (Matrix: Water)				Client sample ID	MW-28B	MW-29A	MW-29B	MW-30A	MW-30B
				Client sampling date / time	16-Jun-2023 12:20	16-Jun-2023 12:40	16-Jun-2023 12:45	15-Jun-2023 17:35	15-Jun-2023 17:45
Analyte	CAS Number	Method/Lab	LOR	Unit	EO2304968-026	EO2304968-027	EO2304968-028	EO2304968-029	EO2304968-030
					Result	Result	Result	Result	Result
Physical Tests									
Alkalinity, bicarbonate (as HCO3)	71-52-3	E290/CG	1.0	mg/L	860	718	537	722	692
Alkalinity, carbonate (as CO3)	3812-32-6	E290/CG	1.0	mg/L	1.9	23.2	<1.0	40.8	15.6
Alkalinity, hydroxide (as OH)	14280-30-9	E290/CG	1.0	mg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity, total (as CaCO3)	----	E290/CG	1.0	mg/L	708	627	440	660	593
Conductivity	----	E100/CG	1.0	µS/cm	12800	3540	8770	1940	2490
Hardness (as CaCO3), dissolved	----	EC100/CG	0.50	mg/L	1040	138	2160	27.6	93.0
pH	----	E108/CG	0.10	pH units	8.29	8.59	8.22	8.89	8.50
Solids, total dissolved [TDS], calculated	----	EC103/CG	1.0	mg/L	10700	2520	8030	1270	1720
Anions and Nutrients									
Ammonia, total (as N)	7664-41-7	E298/EO	0.0050	mg/L	1.68	1.20	0.411	0.414	0.146
Chloride	16887-00-6	E235.Cl/CG	0.50	mg/L	24.0	2.94	10.3	<2.50 DLDS	<2.50 DLDS
Fluoride	16984-48-8	E235.F/CG	0.020	mg/L	<0.400 DLDS	0.379	<0.400 DLDS	0.507	0.761
Kjeldahl nitrogen, total [TKN]	----	E318/EO	0.050	mg/L	2.18	1.64	1.21	0.868	1.00
Nitrate (as N)	14797-55-8	E235.NO3/CG	0.020	mg/L	<0.400 DLDS	0.235	0.454	0.164	0.730
Nitrate + Nitrite (as N)	----	EC235.N+N/CG	0.0032	mg/L	<0.447	0.235	0.454	0.164	0.730
Nitrite (as N)	14797-65-0	E235.NO2/CG	0.010	mg/L	<0.200 DLDS	<0.050 DLDS	<0.200 DLDS	<0.050 DLDS	<0.050 DLDS
Sulfate (as SO4)	14808-79-8	E235.SO4/CG	0.30	mg/L	6770	1250	5250	375	728
Organic / Inorganic Carbon									
Carbon, dissolved organic [DOC]	----	E358-L/CG	0.50	mg/L	13.2	8.85	15.4	8.62	9.55
Ion Balance									
Ion balance (cations/anions)	----	EC101/CG	0.010	%	101	99.0	102	100	99.6
Dissolved Metals									
Aluminum, dissolved	7429-90-5	E421/CG	0.0010	mg/L	<0.0200 DLDS	0.0058	0.0100	0.0092	0.0093
Antimony, dissolved	7440-36-0	E421/CG	0.00010	mg/L	<0.00200 DLDS	<0.00050 DLDS	<0.00100 DLDS	<0.00050 DLDS	<0.00050 DLDS
Arsenic, dissolved	7440-38-2	E421/CG	0.00010	mg/L	<0.00200 DLDS	0.00066	<0.00100 DLDS	0.00078	0.00068
Barium, dissolved	7440-39-3	E421/CG	0.00010	mg/L	0.0103	0.0129	0.0104	0.0123	0.0174
Beryllium, dissolved	7440-41-7	E421/CG	0.000020	mg/L	<0.000400 DLDS	<0.000100 DLDS	<0.000200 DLDS	<0.000100 DLDS	<0.000100 DLDS
Bismuth, dissolved	7440-69-9	E421/CG	0.000050	mg/L	<0.00100 DLDS	<0.000250 DLDS	<0.000500 DLDS	<0.000250 DLDS	<0.000250 DLDS
Boron, dissolved	7440-42-8	E421/CG	0.010	mg/L	0.489	0.686	0.247	0.409	0.136

Analytical Results

Sub-Matrix: Water (Matrix: Water)				Client sample ID	MW-28B	MW-29A	MW-29B	MW-30A	MW-30B
				Client sampling date / time	16-Jun-2023 12:20	16-Jun-2023 12:40	16-Jun-2023 12:45	15-Jun-2023 17:35	15-Jun-2023 17:45
Analyte	CAS Number	Method/Lab	LOR	Unit	EO2304968-026	EO2304968-027	EO2304968-028	EO2304968-029	EO2304968-030
					Result	Result	Result	Result	Result
Dissolved Metals									
Cadmium, dissolved	7440-43-9	E421/CG	0.0000050	mg/L	<0.000100 DLDS	<0.0000250 DLDS	<0.0000500 DLDS	<0.0000250 DLDS	<0.0000250 DLDS
Calcium, dissolved	7440-70-2	E421/CG	0.050	mg/L	232	39.9	404	8.59	22.2
Cesium, dissolved	7440-46-2	E421/CG	0.000010	mg/L	<0.000200 DLDS	<0.000050 DLDS	<0.000100 DLDS	<0.000050 DLDS	<0.000050 DLDS
Chromium, dissolved	7440-47-3	E421/CG	0.00050	mg/L	<0.00200 DLDS	<0.00050	<0.00100 DLDS	<0.00050	<0.00050
Cobalt, dissolved	7440-48-4	E421/CG	0.00010	mg/L	<0.00200 DLDS	<0.00050 DLDS	0.00236	<0.00050 DLDS	<0.00050 DLDS
Copper, dissolved	7440-50-8	E421/CG	0.00020	mg/L	<0.00400 DLDS	<0.00100 DLDS	<0.00200 DLDS	<0.00100 DLDS	0.00144
Iron, dissolved	7439-89-6	E421/CG	0.010	mg/L	<0.200 DLDS	<0.050 DLDS	0.110	<0.050 DLDS	<0.050 DLDS
Lead, dissolved	7439-92-1	E421/CG	0.000050	mg/L	<0.00100 DLDS	<0.000250 DLDS	<0.000500 DLDS	<0.000250 DLDS	<0.000250 DLDS
Lithium, dissolved	7439-93-2	E421/CG	0.0010	mg/L	0.697	0.244	0.699	0.163	0.247
Magnesium, dissolved	7439-95-4	E421/CG	0.0050	mg/L	111	9.21	280	1.49	9.13
Manganese, dissolved	7439-96-5	E421/CG	0.00010	mg/L	0.258	0.0549	0.627	0.0184	0.00051
Mercury, dissolved	7439-97-6	E509/EO	0.0000050	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Molybdenum, dissolved	7439-98-7	E421/CG	0.000050	mg/L	<0.00100 DLDS	0.00154	<0.000500 DLDS	0.00128	0.00115
Nickel, dissolved	7440-02-0	E421/CG	0.00050	mg/L	<0.0100 DLDS	<0.00250 DLDS	0.00618	<0.00250 DLDS	<0.00250 DLDS
Phosphorus, dissolved	7723-14-0	E421/CG	0.050	mg/L	<1.00 DLDS	<0.250 DLDS	<0.500 DLDS	<0.250 DLDS	<0.250 DLDS
Potassium, dissolved	7440-09-7	E421/CG	0.050	mg/L	12.5	4.07	12.4	2.16	2.82
Rubidium, dissolved	7440-17-7	E421/CG	0.00020	mg/L	0.0152	0.00760	0.0181	0.00300	0.00351
Selenium, dissolved	7782-49-2	E421/CG	0.000050	mg/L	<0.00100 DLDS	<0.000250 DLDS	<0.000500 DLDS	<0.000250 DLDS	0.00112
Silicon, dissolved	7440-21-3	E421/CG	0.050	mg/L	4.77	3.79	5.64	3.92	5.07
Silver, dissolved	7440-22-4	E421/CG	0.000010	mg/L	<0.000200 DLDS	<0.000050 DLDS	<0.000100 DLDS	<0.000050 DLDS	<0.000050 DLDS
Sodium, dissolved	7440-23-5	E421/CG	0.050	mg/L	3140	812	1780	470	575
Strontium, dissolved	7440-24-6	E421/CG	0.00020	mg/L	6.22	0.869	8.82	0.168	0.358
Sulfur, dissolved	7704-34-9	E421/CG	0.50	mg/L	2330	432	1930	135	253
Tellurium, dissolved	13494-80-9	E421/CG	0.00020	mg/L	<0.00400 DLDS	<0.00100 DLDS	<0.00200 DLDS	<0.00100 DLDS	<0.00100 DLDS
Thallium, dissolved	7440-28-0	E421/CG	0.000010	mg/L	<0.000200 DLDS	<0.000050 DLDS	<0.000100 DLDS	<0.000050 DLDS	<0.000050 DLDS
Thorium, dissolved	7440-29-1	E421/CG	0.00010	mg/L	<0.00200 DLDS	<0.00050 DLDS	<0.00100 DLDS	<0.00050 DLDS	<0.00050 DLDS
Tin, dissolved	7440-31-5	E421/CG	0.00010	mg/L	<0.00200 DLDS	<0.00050 DLDS	<0.00100 DLDS	<0.00050 DLDS	<0.00050 DLDS
Titanium, dissolved	7440-32-6	E421/CG	0.00030	mg/L	<0.00600 DLDS	<0.00150 DLDS	<0.00300 DLDS	<0.00150 DLDS	<0.00150 DLDS
Tungsten, dissolved	7440-33-7	E421/CG	0.00010	mg/L	<0.00200 DLDS	<0.00050 DLDS	<0.00100 DLDS	<0.00050 DLDS	<0.00050 DLDS
Uranium, dissolved	7440-61-1	E421/CG	0.000010	mg/L	0.000290	0.000614	0.00584	0.000093	0.00488

Analytical Results

Sub-Matrix: Water (Matrix: Water)				Client sample ID	MW-28B	MW-29A	MW-29B	MW-30A	MW-30B
				Client sampling date / time	16-Jun-2023 12:20	16-Jun-2023 12:40	16-Jun-2023 12:45	15-Jun-2023 17:35	15-Jun-2023 17:45
Analyte	CAS Number	Method/Lab	LOR	Unit	EO2304968-026	EO2304968-027	EO2304968-028	EO2304968-029	EO2304968-030
					Result	Result	Result	Result	Result
Dissolved Metals									
Vanadium, dissolved	7440-62-2	E421/CG	0.00050	mg/L	<0.0100 DLDS	<0.00250 DLDS	<0.00500 DLDS	<0.00250 DLDS	<0.00250 DLDS
Zinc, dissolved	7440-66-6	E421/CG	0.0010	mg/L	<0.0200 DLDS	<0.0050 DLDS	<0.0100 DLDS	<0.0050 DLDS	<0.0050 DLDS
Zirconium, dissolved	7440-67-7	E421/CG	0.00020	mg/L	<0.00400 DLDS	<0.00100 DLDS	<0.00200 DLDS	<0.00100 DLDS	<0.00100 DLDS
Dissolved mercury filtration location	----	EP509/EO	-	-	Field	Field	Field	Field	Field
Dissolved metals filtration location	----	EP421/CG	-	-	Field	Field	Field	Field	Field
Aggregate Organics									
Phenols, total (4AAP)	----	E562/EO	0.0010	mg/L	0.0032	0.0014	<0.0010	<0.0010	<0.0010
Volatile Organic Compounds									
Benzene	71-43-2	E611E/EO	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50
Benzene	71-43-2	E611A/EO	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Bromobenzene	108-86-1	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Bromochloromethane	74-97-5	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Bromodichloromethane	75-27-4	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Bromoform	75-25-2	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Bromomethane	74-83-9	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Butylbenzene, n-	104-51-8	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Butylbenzene, sec-	135-98-8	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Butylbenzene, tert-	98-06-6	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Carbon tetrachloride	56-23-5	E611E/EO	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50
Chlorobenzene	108-90-7	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Chloroethane	75-00-3	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Chloroform	67-66-3	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Chloromethane	74-87-3	E611E/EO	5.0	µg/L	<5.0	<5.0	<5.0	<5.0	<5.0
Chlorotoluene, 2-	95-49-8	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Chlorotoluene, 4-	106-43-4	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Cymene, p-	99-87-6	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dibromo-3-chloropropane, 1,2-	96-12-8	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dibromochloromethane	124-48-1	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dibromoethane, 1,2-	106-93-4	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dibromomethane	74-95-3	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0

Analytical Results

Sub-Matrix: Water (Matrix: Water)				Client sample ID	MW-28B	MW-29A	MW-29B	MW-30A	MW-30B
				Client sampling date / time	16-Jun-2023 12:20	16-Jun-2023 12:40	16-Jun-2023 12:45	15-Jun-2023 17:35	15-Jun-2023 17:45
Analyte	CAS Number	Method/Lab	LOR	Unit	EO2304968-026	EO2304968-027	EO2304968-028	EO2304968-029	EO2304968-030
					Result	Result	Result	Result	Result
Volatile Organic Compounds									
Dichlorobenzene, 1,2-	95-50-1	E611E/EO	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50
Dichlorobenzene, 1,3-	541-73-1	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichlorobenzene, 1,4-	106-46-7	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichlorodifluoromethane	75-71-8	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloroethane, 1,1-	75-34-3	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloroethane, 1,2-	107-06-2	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloroethylene, 1,1-	75-35-4	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloroethylene, cis-1,2-	156-59-2	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloroethylene, trans-1,2-	156-60-5	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloromethane	75-09-2	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloropropane, 1,2-	78-87-5	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloropropane, 1,3-	142-28-9	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloropropane, 2,2-	594-20-7	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloropropylene, 1,1-	563-58-6	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloropropylene, cis+trans-1,3-	542-75-6	E611E/EO	1.5	µg/L	<1.5	<1.5	<1.5	<1.5	<1.5
Dichloropropylene, cis-1,3-	10061-01-5	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloropropylene, trans-1,3-	10061-02-6	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Ethylbenzene	100-41-4	E611E/EO	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50
Ethylbenzene	100-41-4	E611A/EO	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Hexachlorobutadiene	87-68-3	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Isopropylbenzene	98-82-8	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Methyl-tert-butyl ether [MTBE]	1634-04-4	E611E/EO	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50
Propylbenzene, n-	103-65-1	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Styrene	100-42-5	E611E/EO	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50
Styrene	100-42-5	E611A/EO	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Tetrachloroethane, 1,1,1,2-	630-20-6	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Tetrachloroethane, 1,1,2,2-	79-34-5	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Tetrachloroethylene	127-18-4	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Toluene	108-88-3	E611E/EO	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50
Toluene	108-88-3	E611A/EO	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050

Analytical Results

Sub-Matrix: Water (Matrix: Water)				Client sample ID	MW-28B	MW-29A	MW-29B	MW-30A	MW-30B
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Analyte	CAS Number	Method/Lab	LOR	Unit	EO2304968-026	EO2304968-027	EO2304968-028	EO2304968-029	EO2304968-030
					Result	Result	Result	Result	Result
Volatile Organic Compounds									
Trichlorobenzene, 1,2,3-	87-61-6	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Trichlorobenzene, 1,2,4-	120-82-1	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Trichloroethane, 1,1,1-	71-55-6	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Trichloroethane, 1,1,2-	79-00-5	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Trichloroethylene	79-01-6	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Trichlorofluoromethane	75-69-4	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Trichloropropane, 1,2,3-	96-18-4	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Trimethylbenzene, 1,2,4-	95-63-6	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Trimethylbenzene, 1,3,5-	108-67-8	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Vinyl chloride	75-01-4	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Xylene, m+p-	179601-23-1	E611E/EO	0.40	µg/L	<0.40	<0.40	<0.40	<0.40	<0.40
Xylene, m+p-	179601-23-1	E611A/EO	0.00040	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene, o-	95-47-6	E611E/EO	0.30	µg/L	<0.30	<0.30	<0.30	<0.30	<0.30
Xylene, o-	95-47-6	E611A/EO	0.00030	mg/L	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Xylenes, total	1330-20-7	E611E/EO	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50
Xylenes, total	1330-20-7	E611A/EO	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
BTEX, total	----	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Trihalomethanes [THMs], total	----	E611E/EO	2.0	µg/L	<2.0	<2.0	<2.0	<2.0	<2.0
Hydrocarbons									
F1 (C6-C10)	----	E581.F1/EO	0.10	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (C10-C16)	----	E601/EO	0.10	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10
F1-BTEX	----	EC580/EO	0.100	mg/L	<0.100	<0.100	<0.100	<0.100	<0.100
Hydrocarbons Surrogates									
Bromobenzotrifluoride, 2- (F2-F4 surrogate)	392-83-6	E601/EO	1.0	%	98.3	97.3	99.8	98.4	99.4
Dichlorotoluene, 3,4-	95-75-0	E581.F1/EO	1.0	%	119	123	113	125	118
Volatile Organic Compounds Surrogates									
Bromofluorobenzene, 4-	460-00-4	E611A/EO	1.0	%	86.6	86.3	79.3	83.6	78.2
Bromofluorobenzene, 4-	460-00-4	E611E/EO	1.0	%	86.6	86.3	79.3	83.6	78.2
Difluorobenzene, 1,4-	540-36-3	E611A/EO	1.0	%	95.0	92.0	94.7	95.2	96.1
Difluorobenzene, 1,4-	540-36-3	E611E/EO	1.0	%	95.0	92.0	94.7	95.2	96.1

Please refer to the General Comments section for an explanation of any result qualifiers detected.

Please refer to the Accreditation section for an explanation of analyte accreditations.

Analytical Results

Sub-Matrix: Water (Matrix: Water)				Client sample ID	MW-31A	MW-31B	MW-32A	MW-32B	MW-33A
				Client sampling date / time	16-Jun-2023 09:10	16-Jun-2023 09:20	16-Jun-2023 09:00	16-Jun-2023 08:50	15-Jun-2023 13:45
Analyte	CAS Number	Method/Lab	LOR	Unit	EO2304968-031	EO2304968-032	EO2304968-033	EO2304968-034	EO2304968-035
					Result	Result	Result	Result	Result
Physical Tests									
Alkalinity, bicarbonate (as HCO3)	71-52-3	E290/CG	1.0	mg/L	1020	620	770	1220	1040
Alkalinity, carbonate (as CO3)	3812-32-6	E290/CG	1.0	mg/L	63.5	33.5	5.6	<1.0	60.8
Alkalinity, hydroxide (as OH)	14280-30-9	E290/CG	1.0	mg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity, total (as CaCO3)	----	E290/CG	1.0	mg/L	938	564	641	998	955
Conductivity	----	E100/CG	1.0	µS/cm	1760	2680	7890	13100	1750
Hardness (as CaCO3), dissolved	----	EC100/CG	0.50	mg/L	13.1	67.7	331	1180	9.82
pH	----	E108/CG	0.10	pH units	8.96	8.82	8.32	8.16	8.94
Solids, total dissolved [TDS], calculated	----	EC103/CG	1.0	mg/L	1100	1860	6260	11400	1110
Anions and Nutrients									
Ammonia, total (as N)	7664-41-7	E298/EO	0.0050	mg/L	0.519	0.0231	3.76	1.87	0.853
Chloride	16887-00-6	E235.Cl/CG	0.50	mg/L	3.31	<2.50 DLDS	<10.0 DLDS	139	20.4
Fluoride	16984-48-8	E235.F/CG	0.020	mg/L	1.06	0.464	<0.400 DLDS	<0.400 DLDS	1.71
Kjeldahl nitrogen, total [TKN]	----	E318/EO	0.050	mg/L	1.26	0.416	3.11	2.61	1.89
Nitrate (as N)	14797-55-8	E235.NO3/CG	0.020	mg/L	0.090	0.155	<0.400 DLDS	<0.400 DLDS	<0.020
Nitrate + Nitrite (as N)	----	EC235.N+N/CG	0.0032	mg/L	0.173	0.155	<0.447	<0.447	<0.0224
Nitrite (as N)	14797-65-0	E235.NO2/CG	0.010	mg/L	0.083	<0.050 DLDS	<0.200 DLDS	<0.200 DLDS	<0.010
Sulfate (as SO4)	14808-79-8	E235.SO4/CG	0.30	mg/L	34.0	845	3760	6910	22.5
Organic / Inorganic Carbon									
Carbon, dissolved organic [DOC]	----	E358-L/CG	0.50	mg/L	11.6	9.30	9.50	15.8	26.5
Ion Balance									
Ion balance (cations/anions)	----	EC101/CG	0.010	%	107	99.3	101	101	97.5
Dissolved Metals									
Aluminum, dissolved	7429-90-5	E421/CG	0.0010	mg/L	0.0066	0.0050	<0.0100 DLDS	<0.0200 DLDS	0.0032
Antimony, dissolved	7440-36-0	E421/CG	0.00010	mg/L	0.00030	<0.00050 DLDS	<0.00100 DLDS	<0.00200 DLDS	0.00013
Arsenic, dissolved	7440-38-2	E421/CG	0.00010	mg/L	0.00312	0.00128	<0.00100 DLDS	<0.00200 DLDS	0.00286
Barium, dissolved	7440-39-3	E421/CG	0.00010	mg/L	0.0472	0.0163	0.0124	0.0142	0.0842
Beryllium, dissolved	7440-41-7	E421/CG	0.000020	mg/L	<0.000020	<0.000100 DLDS	<0.000200 DLDS	<0.000400 DLDS	<0.000020
Bismuth, dissolved	7440-69-9	E421/CG	0.000050	mg/L	<0.000050	<0.000250 DLDS	<0.000500 DLDS	<0.00100 DLDS	<0.000050
Boron, dissolved	7440-42-8	E421/CG	0.010	mg/L	0.609	0.203	0.912	0.478	0.604

Analytical Results

Sub-Matrix: Water (Matrix: Water)				Client sample ID	MW-31A	MW-31B	MW-32A	MW-32B	MW-33A
				Client sampling date / time	16-Jun-2023 09:10	16-Jun-2023 09:20	16-Jun-2023 09:00	16-Jun-2023 08:50	15-Jun-2023 13:45
Analyte	CAS Number	Method/Lab	LOR	Unit	EO2304968-031	EO2304968-032	EO2304968-033	EO2304968-034	EO2304968-035
					Result	Result	Result	Result	Result
Dissolved Metals									
Cadmium, dissolved	7440-43-9	E421/CG	0.0000050	mg/L	0.0000247	<0.0000250 DLDS	<0.0000500 DLDS	<0.000100 DLDS	0.0000060
Calcium, dissolved	7440-70-2	E421/CG	0.050	mg/L	4.42	16.2	110	255	3.22
Cesium, dissolved	7440-46-2	E421/CG	0.000010	mg/L	0.000012	<0.000050 DLDS	0.000142	<0.000200 DLDS	0.000019
Chromium, dissolved	7440-47-3	E421/CG	0.00050	mg/L	<0.00050	<0.00050	<0.00100 DLDS	<0.00200 DLDS	<0.00050
Cobalt, dissolved	7440-48-4	E421/CG	0.00010	mg/L	0.00070	<0.00050 DLDS	<0.00100 DLDS	0.00250	0.00026
Copper, dissolved	7440-50-8	E421/CG	0.00020	mg/L	0.00147	<0.00100 DLDS	<0.00200 DLDS	<0.00400 DLDS	0.00024
Iron, dissolved	7439-89-6	E421/CG	0.010	mg/L	<0.010	<0.050 DLDS	<0.100 DLDS	<0.200 DLDS	0.065
Lead, dissolved	7439-92-1	E421/CG	0.000050	mg/L	<0.000050	<0.000250 DLDS	<0.000500 DLDS	<0.00100 DLDS	<0.000050
Lithium, dissolved	7439-93-2	E421/CG	0.0010	mg/L	0.0939	0.178	0.446	0.564	0.0760
Magnesium, dissolved	7439-95-4	E421/CG	0.0050	mg/L	0.499	6.61	13.6	131	0.432
Manganese, dissolved	7439-96-5	E421/CG	0.00010	mg/L	0.0778	0.00443	0.145	0.697	0.0246
Mercury, dissolved	7439-97-6	E509/EO	0.0000050	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Molybdenum, dissolved	7439-98-7	E421/CG	0.000050	mg/L	0.0105	0.00161	0.00102	<0.00100 DLDS	0.0291
Nickel, dissolved	7440-02-0	E421/CG	0.00050	mg/L	0.00458	<0.00250 DLDS	<0.00500 DLDS	<0.0100 DLDS	0.00122
Phosphorus, dissolved	7723-14-0	E421/CG	0.050	mg/L	0.107	<0.250 DLDS	<0.500 DLDS	<1.00 DLDS	0.227
Potassium, dissolved	7440-09-7	E421/CG	0.050	mg/L	1.75	3.72	7.64	17.1	1.64
Rubidium, dissolved	7440-17-7	E421/CG	0.00020	mg/L	0.00268	0.00252	0.0142	0.0155	0.00242
Selenium, dissolved	7782-49-2	E421/CG	0.000050	mg/L	0.000176	<0.000250 DLDS	<0.000500 DLDS	<0.00100 DLDS	0.000155
Silicon, dissolved	7440-21-3	E421/CG	0.050	mg/L	2.76	3.50	4.94	4.89	3.82
Silver, dissolved	7440-22-4	E421/CG	0.000010	mg/L	<0.000010	<0.000050 DLDS	<0.000100 DLDS	<0.000200 DLDS	<0.000010
Sodium, dissolved	7440-23-5	E421/CG	0.050	mg/L	476	626	1960	3360	446
Strontium, dissolved	7440-24-6	E421/CG	0.00020	mg/L	0.0805	0.288	2.76	5.96	0.0787
Sulfur, dissolved	7704-34-9	E421/CG	0.50	mg/L	12.7	295	1320	2430	7.08
Tellurium, dissolved	13494-80-9	E421/CG	0.00020	mg/L	<0.00020	<0.00100 DLDS	<0.00200 DLDS	<0.00400 DLDS	<0.00020
Thallium, dissolved	7440-28-0	E421/CG	0.000010	mg/L	0.000014	<0.000050 DLDS	<0.000100 DLDS	<0.000200 DLDS	<0.000010
Thorium, dissolved	7440-29-1	E421/CG	0.00010	mg/L	0.00016	<0.00050 DLDS	<0.00100 DLDS	<0.00200 DLDS	<0.00010
Tin, dissolved	7440-31-5	E421/CG	0.00010	mg/L	<0.00010	<0.00050 DLDS	<0.00100 DLDS	<0.00200 DLDS	<0.00010
Titanium, dissolved	7440-32-6	E421/CG	0.00030	mg/L	<0.00030	<0.00150 DLDS	<0.00300 DLDS	<0.00600 DLDS	0.00038
Tungsten, dissolved	7440-33-7	E421/CG	0.00010	mg/L	<0.00010	<0.00050 DLDS	<0.00100 DLDS	<0.00200 DLDS	0.00051
Uranium, dissolved	7440-61-1	E421/CG	0.000010	mg/L	0.00255	0.00148	0.000175	0.000456	0.000960

Analytical Results

Sub-Matrix: Water (Matrix: Water)				Client sample ID	MW-31A	MW-31B	MW-32A	MW-32B	MW-33A
				Client sampling date / time	16-Jun-2023 09:10	16-Jun-2023 09:20	16-Jun-2023 09:00	16-Jun-2023 08:50	15-Jun-2023 13:45
Analyte	CAS Number	Method/Lab	LOR	Unit	EO2304968-031	EO2304968-032	EO2304968-033	EO2304968-034	EO2304968-035
					Result	Result	Result	Result	Result
Dissolved Metals									
Vanadium, dissolved	7440-62-2	E421/CG	0.00050	mg/L	0.00061	<0.00250 DLDS	<0.00500 DLDS	<0.0100 DLDS	0.00079
Zinc, dissolved	7440-66-6	E421/CG	0.0010	mg/L	<0.0010	<0.0050 DLDS	<0.0100 DLDS	<0.0200 DLDS	<0.0010
Zirconium, dissolved	7440-67-7	E421/CG	0.00020	mg/L	0.00171	<0.00100 DLDS	<0.00200 DLDS	<0.00400 DLDS	0.00132
Dissolved mercury filtration location	----	EP509/EO	-	-	Field	Field	Field	Field	Field
Dissolved metals filtration location	----	EP421/CG	-	-	Field	Field	Field	Field	Field
Aggregate Organics									
Phenols, total (4AAP)	----	E562/EO	0.0010	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Volatile Organic Compounds									
Benzene	71-43-2	E611E/EO	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50
Benzene	71-43-2	E611A/EO	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Bromobenzene	108-86-1	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Bromochloromethane	74-97-5	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Bromodichloromethane	75-27-4	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Bromoform	75-25-2	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Bromomethane	74-83-9	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Butylbenzene, n-	104-51-8	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Butylbenzene, sec-	135-98-8	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Butylbenzene, tert-	98-06-6	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Carbon tetrachloride	56-23-5	E611E/EO	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50
Chlorobenzene	108-90-7	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Chloroethane	75-00-3	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Chloroform	67-66-3	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Chloromethane	74-87-3	E611E/EO	5.0	µg/L	<5.0	<5.0	<5.0	<5.0	<5.0
Chlorotoluene, 2-	95-49-8	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Chlorotoluene, 4-	106-43-4	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Cymene, p-	99-87-6	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dibromo-3-chloropropane, 1,2-	96-12-8	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dibromochloromethane	124-48-1	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dibromoethane, 1,2-	106-93-4	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dibromomethane	74-95-3	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0

Analytical Results

Sub-Matrix: Water (Matrix: Water)				Client sample ID	MW-31A	MW-31B	MW-32A	MW-32B	MW-33A
				Client sampling date / time	16-Jun-2023 09:10	16-Jun-2023 09:20	16-Jun-2023 09:00	16-Jun-2023 08:50	15-Jun-2023 13:45
Analyte	CAS Number	Method/Lab	LOR	Unit	EO2304968-031	EO2304968-032	EO2304968-033	EO2304968-034	EO2304968-035
					Result	Result	Result	Result	Result
Volatile Organic Compounds									
Dichlorobenzene, 1,2-	95-50-1	E611E/EO	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50
Dichlorobenzene, 1,3-	541-73-1	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichlorobenzene, 1,4-	106-46-7	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichlorodifluoromethane	75-71-8	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloroethane, 1,1-	75-34-3	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloroethane, 1,2-	107-06-2	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloroethylene, 1,1-	75-35-4	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloroethylene, cis-1,2-	156-59-2	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloroethylene, trans-1,2-	156-60-5	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloromethane	75-09-2	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloropropane, 1,2-	78-87-5	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloropropane, 1,3-	142-28-9	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloropropane, 2,2-	594-20-7	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloropropylene, 1,1-	563-58-6	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloropropylene, cis+trans-1,3-	542-75-6	E611E/EO	1.5	µg/L	<1.5	<1.5	<1.5	<1.5	<1.5
Dichloropropylene, cis-1,3-	10061-01-5	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloropropylene, trans-1,3-	10061-02-6	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Ethylbenzene	100-41-4	E611E/EO	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50
Ethylbenzene	100-41-4	E611A/EO	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Hexachlorobutadiene	87-68-3	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Isopropylbenzene	98-82-8	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Methyl-tert-butyl ether [MTBE]	1634-04-4	E611E/EO	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50
Propylbenzene, n-	103-65-1	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Styrene	100-42-5	E611E/EO	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50
Styrene	100-42-5	E611A/EO	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Tetrachloroethane, 1,1,1,2-	630-20-6	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Tetrachloroethane, 1,1,2,2-	79-34-5	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Tetrachloroethylene	127-18-4	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Toluene	108-88-3	E611E/EO	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50
Toluene	108-88-3	E611A/EO	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050

Analytical Results

Sub-Matrix: Water (Matrix: Water)				Client sample ID	MW-31A	MW-31B	MW-32A	MW-32B	MW-33A
				Client sampling date / time	16-Jun-2023 09:10	16-Jun-2023 09:20	16-Jun-2023 09:00	16-Jun-2023 08:50	15-Jun-2023 13:45
Analyte	CAS Number	Method/Lab	LOR	Unit	EO2304968-031	EO2304968-032	EO2304968-033	EO2304968-034	EO2304968-035
					Result	Result	Result	Result	Result
Volatile Organic Compounds									
Trichlorobenzene, 1,2,3-	87-61-6	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Trichlorobenzene, 1,2,4-	120-82-1	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Trichloroethane, 1,1,1-	71-55-6	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Trichloroethane, 1,1,2-	79-00-5	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Trichloroethylene	79-01-6	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Trichlorofluoromethane	75-69-4	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Trichloropropane, 1,2,3-	96-18-4	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Trimethylbenzene, 1,2,4-	95-63-6	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Trimethylbenzene, 1,3,5-	108-67-8	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Vinyl chloride	75-01-4	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Xylene, m+p-	179601-23-1	E611E/EO	0.40	µg/L	<0.40	<0.40	<0.40	<0.40	<0.40
Xylene, m+p-	179601-23-1	E611A/EO	0.00040	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene, o-	95-47-6	E611E/EO	0.30	µg/L	<0.30	<0.30	<0.30	<0.30	<0.30
Xylene, o-	95-47-6	E611A/EO	0.00030	mg/L	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Xylenes, total	1330-20-7	E611E/EO	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50
Xylenes, total	1330-20-7	E611A/EO	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
BTEX, total	----	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Trihalomethanes [THMs], total	----	E611E/EO	2.0	µg/L	<2.0	<2.0	<2.0	<2.0	<2.0
Hydrocarbons									
F1 (C6-C10)	----	E581.F1/EO	0.10	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (C10-C16)	----	E601/EO	0.10	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10
F1-BTEX	----	EC580/EO	0.100	mg/L	<0.100	<0.100	<0.100	<0.100	<0.100
Hydrocarbons Surrogates									
Bromobenzotrifluoride, 2- (F2-F4 surrogate)	392-83-6	E601/EO	1.0	%	94.5	95.8	102	101	100
Dichlorotoluene, 3,4-	95-75-0	E581.F1/EO	1.0	%	117	116	116	121	124
Volatile Organic Compounds Surrogates									
Bromofluorobenzene, 4-	460-00-4	E611A/EO	1.0	%	81.0	80.9	79.0	82.8	83.3
Bromofluorobenzene, 4-	460-00-4	E611E/EO	1.0	%	81.0	80.9	79.0	82.8	83.3
Difluorobenzene, 1,4-	540-36-3	E611A/EO	1.0	%	95.4	94.3	93.2	94.7	93.7
Difluorobenzene, 1,4-	540-36-3	E611E/EO	1.0	%	95.4	94.3	93.2	94.7	93.7

Please refer to the General Comments section for an explanation of any result qualifiers detected.

Please refer to the Accreditation section for an explanation of analyte accreditations.

Analytical Results

Sub-Matrix: Water (Matrix: Water)				Client sample ID	MW-33B	MW-35-DEEP	MW-35A	MW-35B	MW-36 DEEP
				Client sampling date / time	15-Jun-2023 13:55	16-Jun-2023 10:20	16-Jun-2023 10:30	16-Jun-2023 10:40	16-Jun-2023 09:45
Analyte	CAS Number	Method/Lab	LOR	Unit	EO2304968-036	EO2304968-037	EO2304968-038	EO2304968-039	EO2304968-041
					Result	Result	Result	Result	Result
Physical Tests									
Alkalinity, bicarbonate (as HCO3)	71-52-3	E290/CG	1.0	mg/L	1050	474	971	784	820
Alkalinity, carbonate (as CO3)	3812-32-6	E290/CG	1.0	mg/L	13.9	25.0	64.1	<1.0	52.8
Alkalinity, hydroxide (as OH)	14280-30-9	E290/CG	1.0	mg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity, total (as CaCO3)	----	E290/CG	1.0	mg/L	884	430	903	643	760
Conductivity	----	E100/CG	1.0	µS/cm	5100	5170	1730	7650	4680
Hardness (as CaCO3), dissolved	----	EC100/CG	0.50	mg/L	370	63.3	14.9	309	49.1
pH	----	E108/CG	0.10	pH units	8.40	8.73	8.99	8.28	8.88
Solids, total dissolved [TDS], calculated	----	EC103/CG	1.0	mg/L	3810	2840	1130	5970	2610
Anions and Nutrients									
Ammonia, total (as N)	7664-41-7	E298/EO	0.0050	mg/L	0.680	1.02	0.375	1.42	1.41
Chloride	16887-00-6	E235.Cl/CG	0.50	mg/L	16.9	1420	38.1	<10.0 DLDS	1070
Fluoride	16984-48-8	E235.F/CG	0.020	mg/L	0.218	0.610	1.55	<0.400 DLDS	0.432
Kjeldahl nitrogen, total [TKN]	----	E318/EO	0.050	mg/L	2.88	1.71	4.45	1.70	2.44
Nitrate (as N)	14797-55-8	E235.NO3/CG	0.020	mg/L	<0.200 DLDS	<0.200 DLDS	0.056	0.753	<0.200 DLDS
Nitrate + Nitrite (as N)	----	EC235.N+N/CG	0.0032	mg/L	0.231	<0.224	0.0940	0.753	<0.224
Nitrite (as N)	14797-65-0	E235.NO2/CG	0.010	mg/L	0.231	<0.100 DLDS	0.038	<0.200 DLDS	<0.100 DLDS
Sulfate (as SO4)	14808-79-8	E235.SO4/CG	0.30	mg/L	1890	46.1	15.1	3620	8.86
Organic / Inorganic Carbon									
Carbon, dissolved organic [DOC]	----	E358-L/CG	0.50	mg/L	42.3	23.8	22.2	9.94	36.6
Ion Balance									
Ion balance (cations/anions)	----	EC101/CG	0.010	%	102	95.0	110	96.9	98.0
Total Metals									
Aluminum, total	7429-90-5	E420/CG	0.0030	mg/L	----	----	11.4	5.40	0.249
Antimony, total	7440-36-0	E420/CG	0.00010	mg/L	----	----	0.00154	<0.00100 DLDS	<0.00050 DLDS
Arsenic, total	7440-38-2	E420/CG	0.00010	mg/L	----	----	0.0122	0.00454	0.00268
Barium, total	7440-39-3	E420/CG	0.00010	mg/L	----	----	0.473	0.305	0.461
Beryllium, total	7440-41-7	E420/CG	0.000020	mg/L	----	----	0.000756	0.000705	<0.000100 DLDS
Bismuth, total	7440-69-9	E420/CG	0.000050	mg/L	----	----	0.000286	<0.000500 DLDS	<0.000250 DLDS
Boron, total	7440-42-8	E420/CG	0.010	mg/L	----	----	0.861	0.881	0.824

Analytical Results

Sub-Matrix: **Water**
(Matrix: **Water**)

Analyte	CAS Number	Method/Lab	LOR	Unit	MW-33B	MW-35-DEEP	MW-35A	MW-35B	MW-36 DEEP
Client sample ID					MW-33B	MW-35-DEEP	MW-35A	MW-35B	MW-36 DEEP
Client sampling date / time					15-Jun-2023 13:55	16-Jun-2023 10:20	16-Jun-2023 10:30	16-Jun-2023 10:40	16-Jun-2023 09:45
					EO2304968-036	EO2304968-037	EO2304968-038	EO2304968-039	EO2304968-041
					Result	Result	Result	Result	Result
Total Metals									
Cadmium, total	7440-43-9	E420/CG	0.0000050	mg/L	----	----	0.00177	<0.0000500 DLDS	0.000110
Calcium, total	7440-70-2	E420/CG	0.050	mg/L	----	----	14.7	108	18.3
Cesium, total	7440-46-2	E420/CG	0.000010	mg/L	----	----	0.00228	0.000582	0.000058
Chromium, total	7440-47-3	E420/CG	0.00050	mg/L	----	----	0.0177	0.00330	0.00121
Cobalt, total	7440-48-4	E420/CG	0.00010	mg/L	----	----	0.0117	0.00171	0.00195
Copper, total	7440-50-8	E420/CG	0.00050	mg/L	----	----	0.189	0.00734	0.00559
Iron, total	7439-89-6	E420/CG	0.010	mg/L	----	----	26.4	7.26	0.787
Lead, total	7439-92-1	E420/CG	0.000050	mg/L	----	----	0.0192	0.00846	0.00117
Lithium, total	7439-93-2	E420/CG	0.0010	mg/L	----	----	0.0989	0.596	0.193
Magnesium, total	7439-95-4	E420/CG	0.0050	mg/L	----	----	4.44	16.1	2.32
Manganese, total	7439-96-5	E420/CG	0.00010	mg/L	----	----	0.945	0.202	0.532
Mercury, total	7439-97-6	E508/CG	0.0000050	mg/L	----	----	<0.0000500 DLIS	0.0000132 RRV	<0.0000050
Molybdenum, total	7439-98-7	E420/CG	0.000050	mg/L	----	----	0.0156	0.00192	0.0207
Nickel, total	7440-02-0	E420/CG	0.00050	mg/L	----	----	0.0369	0.0124	0.00780
Phosphorus, total	7723-14-0	E420/CG	0.050	mg/L	----	----	1.94	<0.500 DLDS	<0.250 DLDS
Potassium, total	7440-09-7	E420/CG	0.050	mg/L	----	----	6.02	9.14	3.89
Rubidium, total	7440-17-7	E420/CG	0.00020	mg/L	----	----	0.0243	0.0216	0.00628
Selenium, total	7782-49-2	E420/CG	0.000050	mg/L	----	----	0.000543	<0.000500 DLDS	<0.000250 DLDS
Silicon, total	7440-21-3	E420/CG	0.10	mg/L	----	----	30.5	15.0	4.55
Silver, total	7440-22-4	E420/CG	0.000010	mg/L	----	----	0.000250	<0.000100 DLDS	<0.000050 DLDS
Sodium, total	7440-23-5	E420/CG	0.050	mg/L	----	----	473	2000	1090
Strontium, total	7440-24-6	E420/CG	0.00020	mg/L	----	----	0.208	2.62	0.456
Sulfur, total	7704-34-9	E420/CG	0.50	mg/L	----	----	9.78	1380	5.03
Tellurium, total	13494-80-9	E420/CG	0.00020	mg/L	----	----	<0.00100 DLDS	<0.00200 DLDS	<0.00100 DLDS
Thallium, total	7440-28-0	E420/CG	0.000010	mg/L	----	----	0.000147	<0.000100 DLDS	<0.000050 DLDS
Thorium, total	7440-29-1	E420/CG	0.00010	mg/L	----	----	<0.00050 DLDS	0.0105	<0.00050 DLDS
Tin, total	7440-31-5	E420/CG	0.00010	mg/L	----	----	0.00830	<0.00100 DLDS	0.00917
Titanium, total	7440-32-6	E420/CG	0.00030	mg/L	----	----	0.120	0.0362	0.00690
Tungsten, total	7440-33-7	E420/CG	0.00010	mg/L	----	----	0.00134 DTC	<0.00100 DLDS	<0.00050 DLDS
Uranium, total	7440-61-1	E420/CG	0.000010	mg/L	----	----	0.00202	0.00374	0.00175

Analytical Results

Sub-Matrix: **Water**
(Matrix: **Water**)

Analyte	CAS Number	Method/Lab	LOR	Unit	MW-33B	MW-35-DEEP	MW-35A	MW-35B	MW-36 DEEP
				Client sample ID	MW-33B	MW-35-DEEP	MW-35A	MW-35B	MW-36 DEEP
				Client sampling date / time	15-Jun-2023 13:55	16-Jun-2023 10:20	16-Jun-2023 10:30	16-Jun-2023 10:40	16-Jun-2023 09:45
					EO2304968-036	EO2304968-037	EO2304968-038	EO2304968-039	EO2304968-041
					Result	Result	Result	Result	Result
Total Metals									
Vanadium, total	7440-62-2	E420/CG	0.00050	mg/L	----	----	0.0281	0.00666	<0.00250 DLDS
Zinc, total	7440-66-6	E420/CG	0.0030	mg/L	----	----	0.236	<0.0300 DLDS	0.0325
Zirconium, total	7440-67-7	E420/CG	0.00020	mg/L	----	----	<0.00100 DLDS, DTC	0.00459	0.00106 DLDS, DTC
Dissolved Metals									
Aluminum, dissolved	7429-90-5	E421/CG	0.0010	mg/L	<0.0100 DLDS	<0.0100 DLDS	0.0223	0.0182	0.0065
Antimony, dissolved	7440-36-0	E421/CG	0.00010	mg/L	<0.00100 DLDS	<0.00100 DLDS	0.00118	<0.00100 DLDS	<0.00050 DLDS
Arsenic, dissolved	7440-38-2	E421/CG	0.00010	mg/L	0.00110	0.00112	0.00252	<0.00100 DLDS	0.00197
Barium, dissolved	7440-39-3	E421/CG	0.00010	mg/L	0.0193	0.341	0.0707	0.0259	0.427
Beryllium, dissolved	7440-41-7	E421/CG	0.000020	mg/L	<0.000200 DLDS	<0.000200 DLDS	<0.000100 DLDS	<0.000200 DLDS	<0.000100 DLDS
Bismuth, dissolved	7440-69-9	E421/CG	0.000050	mg/L	<0.000500 DLDS	<0.000500 DLDS	<0.000250 DLDS	<0.000500 DLDS	<0.000250 DLDS
Boron, dissolved	7440-42-8	E421/CG	0.010	mg/L	0.377	0.680	0.990	0.800	0.729
Cadmium, dissolved	7440-43-9	E421/CG	0.0000050	mg/L	<0.0000500 DLDS	<0.0000500 DLDS	0.0000578	<0.0000500 DLDS	<0.0000250 DLDS
Calcium, dissolved	7440-70-2	E421/CG	0.050	mg/L	94.8	21.4	5.13	101	16.4
Cesium, dissolved	7440-46-2	E421/CG	0.000010	mg/L	<0.000100 DLDS	<0.000100 DLDS	0.000122	<0.000100 DLDS	<0.000050 DLDS
Chromium, dissolved	7440-47-3	E421/CG	0.00050	mg/L	<0.00100 DLDS	<0.00100 DLDS	<0.00050	<0.00100 DLDS	<0.00050
Cobalt, dissolved	7440-48-4	E421/CG	0.00010	mg/L	0.00151	<0.00100 DLDS	0.00068	<0.00100 DLDS	0.00073
Copper, dissolved	7440-50-8	E421/CG	0.00020	mg/L	<0.00200 DLDS	<0.00200 DLDS	0.0315	<0.00200 DLDS	<0.00100 DLDS
Iron, dissolved	7439-89-6	E421/CG	0.010	mg/L	<0.100 DLDS	<0.100 DLDS	0.054	<0.100 DLDS	0.093
Lead, dissolved	7439-92-1	E421/CG	0.000050	mg/L	<0.000500 DLDS	<0.000500 DLDS	<0.000250 DLDS	<0.000500 DLDS	<0.000250 DLDS
Lithium, dissolved	7439-93-2	E421/CG	0.0010	mg/L	0.336	0.179	0.0974	0.556	0.184
Magnesium, dissolved	7439-95-4	E421/CG	0.0050	mg/L	32.5	2.40	0.508	13.7	1.97
Manganese, dissolved	7439-96-5	E421/CG	0.00010	mg/L	0.197	0.0544	0.00133	0.0741	0.478
Mercury, dissolved	7439-97-6	E509/EO	0.0000050	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Molybdenum, dissolved	7439-98-7	E421/CG	0.000050	mg/L	0.000770	0.0198	0.0208	0.00235	0.0196
Nickel, dissolved	7440-02-0	E421/CG	0.00050	mg/L	0.00936	<0.00500 DLDS	0.00731	<0.00500 DLDS	0.00350
Phosphorus, dissolved	7723-14-0	E421/CG	0.050	mg/L	<0.500 DLDS	<0.500 DLDS	0.379	<0.500 DLDS	<0.250 DLDS
Potassium, dissolved	7440-09-7	E421/CG	0.050	mg/L	6.14	4.15	3.56	7.78	3.75
Rubidium, dissolved	7440-17-7	E421/CG	0.00020	mg/L	0.00765	0.00666	0.00390	0.0133	0.00500
Selenium, dissolved	7782-49-2	E421/CG	0.000050	mg/L	<0.000500 DLDS	<0.000500 DLDS	<0.000250 DLDS	<0.000500 DLDS	<0.000250 DLDS
Silicon, dissolved	7440-21-3	E421/CG	0.050	mg/L	5.35	3.68	5.50	3.31	3.77

Analytical Results

Sub-Matrix: Water (Matrix: Water)				Client sample ID	MW-33B	MW-35-DEEP	MW-35A	MW-35B	MW-36 DEEP
				Client sampling date / time	15-Jun-2023 13:55	16-Jun-2023 10:20	16-Jun-2023 10:30	16-Jun-2023 10:40	16-Jun-2023 09:45
Analyte	CAS Number	Method/Lab	LOR	Unit	EO2304968-036	EO2304968-037	EO2304968-038	EO2304968-039	EO2304968-041
					Result	Result	Result	Result	Result
Dissolved Metals									
Silver, dissolved	7440-22-4	E421/CG	0.000010	mg/L	<0.000100 DLDS	<0.000100 DLDS	<0.000050 DLDS	<0.000100 DLDS	<0.000050 DLDS
Sodium, dissolved	7440-23-5	E421/CG	0.050	mg/L	1180	1050	483	1820	1000
Strontium, dissolved	7440-24-6	E421/CG	0.00020	mg/L	1.89	0.529	0.112	2.46	0.446
Sulfur, dissolved	7704-34-9	E421/CG	0.50	mg/L	653	40.4	8.64	1160	4.27
Tellurium, dissolved	13494-80-9	E421/CG	0.00020	mg/L	<0.00200 DLDS	<0.00200 DLDS	<0.00100 DLDS	<0.00200 DLDS	<0.00100 DLDS
Thallium, dissolved	7440-28-0	E421/CG	0.000010	mg/L	<0.000100 DLDS	<0.000100 DLDS	<0.000050 DLDS	<0.000100 DLDS	<0.000050 DLDS
Thorium, dissolved	7440-29-1	E421/CG	0.00010	mg/L	<0.00100 DLDS	<0.00100 DLDS	<0.00050 DLDS	<0.00100 DLDS	<0.00050 DLDS
Tin, dissolved	7440-31-5	E421/CG	0.00010	mg/L	<0.00100 DLDS	0.00601	0.00052	<0.00100 DLDS	0.00335
Titanium, dissolved	7440-32-6	E421/CG	0.00030	mg/L	<0.00300 DLDS	<0.00300 DLDS	0.00194	<0.00300 DLDS	<0.00150 DLDS
Tungsten, dissolved	7440-33-7	E421/CG	0.00010	mg/L	<0.00100 DLDS	<0.00100 DLDS	0.00216 DTC	<0.00100 DLDS	<0.00050 DLDS
Uranium, dissolved	7440-61-1	E421/CG	0.000010	mg/L	<0.000100 DLDS	0.00113	0.000857	0.000898	0.00144
Vanadium, dissolved	7440-62-2	E421/CG	0.00050	mg/L	<0.00500 DLDS	<0.00500 DLDS	<0.00250 DLDS	<0.00500 DLDS	<0.00250 DLDS
Zinc, dissolved	7440-66-6	E421/CG	0.0010	mg/L	<0.0100 DLDS	<0.0100 DLDS	<0.0050 DLDS	<0.0100 DLDS	<0.0050 DLDS
Zirconium, dissolved	7440-67-7	E421/CG	0.00020	mg/L	<0.00200 DLDS	<0.00200 DLDS	0.00274 DTC	<0.00200 DLDS	0.00170 DTC
Dissolved mercury filtration location	----	EP509/EO	-	-	Field	Field	Field	Field	Field
Dissolved metals filtration location	----	EP421/CG	-	-	Field	Field	Laboratory	Field	Field
Aggregate Organics									
Phenols, total (4AAP)	----	E562/EO	0.0010	mg/L	<0.0010	0.0019	0.0012	<0.0010	0.0213
Volatile Organic Compounds									
Benzene	71-43-2	E611E/EO	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50
Benzene	71-43-2	E611A/EO	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Bromobenzene	108-86-1	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Bromochloromethane	74-97-5	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Bromodichloromethane	75-27-4	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Bromoform	75-25-2	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Bromomethane	74-83-9	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Butylbenzene, n-	104-51-8	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Butylbenzene, sec-	135-98-8	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Butylbenzene, tert-	98-06-6	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Carbon tetrachloride	56-23-5	E611E/EO	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50

Analytical Results

Sub-Matrix: Water (Matrix: Water)				Client sample ID	MW-33B	MW-35-DEEP	MW-35A	MW-35B	MW-36 DEEP
				Client sampling date / time	15-Jun-2023 13:55	16-Jun-2023 10:20	16-Jun-2023 10:30	16-Jun-2023 10:40	16-Jun-2023 09:45
Analyte	CAS Number	Method/Lab	LOR	Unit	EO2304968-036	EO2304968-037	EO2304968-038	EO2304968-039	EO2304968-041
					Result	Result	Result	Result	Result
Volatile Organic Compounds									
Chlorobenzene	108-90-7	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Chloroethane	75-00-3	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Chloroform	67-66-3	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Chloromethane	74-87-3	E611E/EO	5.0	µg/L	<5.0	<5.0	<5.0	<5.0	<5.0
Chlorotoluene, 2-	95-49-8	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Chlorotoluene, 4-	106-43-4	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Cymene, p-	99-87-6	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dibromo-3-chloropropane, 1,2-	96-12-8	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dibromochloromethane	124-48-1	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dibromoethane, 1,2-	106-93-4	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dibromomethane	74-95-3	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichlorobenzene, 1,2-	95-50-1	E611E/EO	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50
Dichlorobenzene, 1,3-	541-73-1	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichlorobenzene, 1,4-	106-46-7	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichlorodifluoromethane	75-71-8	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloroethane, 1,1-	75-34-3	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloroethane, 1,2-	107-06-2	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloroethylene, 1,1-	75-35-4	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloroethylene, cis-1,2-	156-59-2	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloroethylene, trans-1,2-	156-60-5	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloromethane	75-09-2	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloropropane, 1,2-	78-87-5	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloropropane, 1,3-	142-28-9	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloropropane, 2,2-	594-20-7	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloropropylene, 1,1-	563-58-6	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloropropylene, cis+trans-1,3-	542-75-6	E611E/EO	1.5	µg/L	<1.5	<1.5	<1.5	<1.5	<1.5
Dichloropropylene, cis-1,3-	10061-01-5	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloropropylene, trans-1,3-	10061-02-6	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Ethylbenzene	100-41-4	E611E/EO	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50
Ethylbenzene	100-41-4	E611A/EO	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050

Analytical Results

Sub-Matrix: Water (Matrix: Water)				Client sample ID	MW-33B	MW-35-DEEP	MW-35A	MW-35B	MW-36 DEEP
				Client sampling date / time	15-Jun-2023 13:55	16-Jun-2023 10:20	16-Jun-2023 10:30	16-Jun-2023 10:40	16-Jun-2023 09:45
Analyte	CAS Number	Method/Lab	LOR	Unit	EO2304968-036	EO2304968-037	EO2304968-038	EO2304968-039	EO2304968-041
					Result	Result	Result	Result	Result
Volatile Organic Compounds									
Hexachlorobutadiene	87-68-3	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Isopropylbenzene	98-82-8	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Methyl-tert-butyl ether [MTBE]	1634-04-4	E611E/EO	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50
Propylbenzene, n-	103-65-1	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Styrene	100-42-5	E611E/EO	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50
Styrene	100-42-5	E611A/EO	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Tetrachloroethane, 1,1,1,2-	630-20-6	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Tetrachloroethane, 1,1,2,2-	79-34-5	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Tetrachloroethylene	127-18-4	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Toluene	108-88-3	E611E/EO	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50
Toluene	108-88-3	E611A/EO	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Trichlorobenzene, 1,2,3-	87-61-6	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Trichlorobenzene, 1,2,4-	120-82-1	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Trichloroethane, 1,1,1-	71-55-6	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Trichloroethane, 1,1,2-	79-00-5	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Trichloroethylene	79-01-6	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Trichlorofluoromethane	75-69-4	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Trichloropropane, 1,2,3-	96-18-4	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Trimethylbenzene, 1,2,4-	95-63-6	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Trimethylbenzene, 1,3,5-	108-67-8	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Vinyl chloride	75-01-4	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Xylene, m+p-	179601-23-1	E611E/EO	0.40	µg/L	<0.40	<0.40	<0.40	<0.40	<0.40
Xylene, m+p-	179601-23-1	E611A/EO	0.00040	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene, o-	95-47-6	E611E/EO	0.30	µg/L	<0.30	<0.30	<0.30	<0.30	<0.30
Xylene, o-	95-47-6	E611A/EO	0.00030	mg/L	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Xylenes, total	1330-20-7	E611E/EO	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50
Xylenes, total	1330-20-7	E611A/EO	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
BTEX, total	----	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Trihalomethanes [THMs], total	----	E611E/EO	2.0	µg/L	<2.0	<2.0	<2.0	<2.0	<2.0
Hydrocarbons									

Analytical Results

Sub-Matrix: Water (Matrix: Water)				Client sample ID	MW-33B	MW-35-DEEP	MW-35A	MW-35B	MW-36 DEEP
				Client sampling date / time	15-Jun-2023 13:55	16-Jun-2023 10:20	16-Jun-2023 10:30	16-Jun-2023 10:40	16-Jun-2023 09:45
Analyte	CAS Number	Method/Lab	LOR	Unit	EO2304968-036	EO2304968-037	EO2304968-038	EO2304968-039	EO2304968-041
					Result	Result	Result	Result	Result
Hydrocarbons									
F1 (C6-C10)	----	E581.F1/EO	0.10	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (C10-C16)	----	E601/EO	0.10	mg/L	<0.10	0.28	<0.10	<0.10	<0.10
F1-BTEX	----	EC580/EO	0.100	mg/L	<0.100	<0.100	<0.100	<0.100	<0.100
Hydrocarbons Surrogates									
Bromobenzotrifluoride, 2- (F2-F4 surrogate)	392-83-6	E601/EO	1.0	%	98.9	102	102	101	99.4
Dichlorotoluene, 3,4-	95-75-0	E581.F1/EO	1.0	%	128	120	108	117	124
Volatile Organic Compounds Surrogates									
Bromofluorobenzene, 4-	460-00-4	E611A/EO	1.0	%	90.1	92.5	88.6	91.6	92.8
Bromofluorobenzene, 4-	460-00-4	E611E/EO	1.0	%	90.1	92.5	88.6	91.6	92.8
Difluorobenzene, 1,4-	540-36-3	E611A/EO	1.0	%	84.6	86.2	86.0	87.6	85.4
Difluorobenzene, 1,4-	540-36-3	E611E/EO	1.0	%	84.6	86.2	86.0	87.6	85.4

Please refer to the General Comments section for an explanation of any result qualifiers detected.

Please refer to the Accreditation section for an explanation of analyte accreditations.

Analytical Results

Sub-Matrix: **Water**
(Matrix: **Water**)

				Client sample ID	MW-36A	DUP A	DUP B	DUP C	DUP D
				Client sampling date / time	16-Jun-2023 09:45	[15-Jun-2023]	[15-Jun-2023]	[15-Jun-2023]	[15-Jun-2023]
Analyte	CAS Number	Method/Lab	LOR	Unit	EO2304968-042	EO2304968-043	EO2304968-044	EO2304968-045	EO2304968-046
					Result	Result	Result	Result	Result
Physical Tests									
Alkalinity, bicarbonate (as HCO3)	71-52-3	E290/CG	1.0	mg/L	944	1180	927	936	746
Alkalinity, carbonate (as CO3)	3812-32-6	E290/CG	1.0	mg/L	68.5	66.8	40.8	66.1	50.4
Alkalinity, hydroxide (as OH)	14280-30-9	E290/CG	1.0	mg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity, total (as CaCO3)	----	E290/CG	1.0	mg/L	888	1080	828	878	695
Conductivity	----	E100/CG	1.0	µS/cm	1570	2070	3040	1580	3270
Hardness (as CaCO3), dissolved	----	EC100/CG	0.50	mg/L	9.02	20.8	88.2	8.97	39.1
pH	----	E108/CG	0.10	pH units	9.03	8.90	8.77	9.02	8.91
Solids, total dissolved [TDS], calculated	----	EC103/CG	1.0	mg/L	1010	1380	2140	1000	2300
Anions and Nutrients									
Ammonia, total (as N)	7664-41-7	E298/EO	0.0050	mg/L	0.701	0.300	0.0515	0.660	1.24
Chloride	16887-00-6	E235.Cl/CG	0.50	mg/L	6.68	5.62	<2.50 DLDS	6.62	3.73
Fluoride	16984-48-8	E235.F/CG	0.020	mg/L	1.68	0.824	0.382	1.67	0.639
Kjeldahl nitrogen, total [TKN]	----	E318/EO	0.050	mg/L	1.16	1.35	0.354	0.991	1.72
Nitrate (as N)	14797-55-8	E235.NO3/CG	0.020	mg/L	0.022	0.338	<0.100 DLDS	<0.020	<0.100 DLDS
Nitrate + Nitrite (as N)	----	EC235.N+N/CG	0.0032	mg/L	<0.0224	0.338	<0.112	<0.0224	<0.112
Nitrite (as N)	14797-65-0	E235.NO2/CG	0.010	mg/L	<0.010	<0.050 DLDS	<0.050 DLDS	0.014	<0.050 DLDS
Sulfate (as SO4)	14808-79-8	E235.SO4/CG	0.30	mg/L	<0.30	149	832	<0.30	1010
Organic / Inorganic Carbon									
Carbon, dissolved organic [DOC]	----	E358-L/CG	0.50	mg/L	17.1	8.23	6.60	15.5	10.8
Ion Balance									
Ion balance (cations/anions)	----	EC101/CG	0.010	%	107	98.0	102	108	106
Total Metals									
Aluminum, total	7429-90-5	E420/CG	0.0030	mg/L	0.0849	8.14	0.932	0.0952	0.192
Antimony, total	7440-36-0	E420/CG	0.00010	mg/L	<0.00010	<0.00050 DLDS	<0.00050 DLDS	<0.00010	<0.00050 DLDS
Arsenic, total	7440-38-2	E420/CG	0.00010	mg/L	0.00097	0.00862	0.00198	0.00091	0.00090
Barium, total	7440-39-3	E420/CG	0.00010	mg/L	0.0815	0.553	0.0222	0.0812	0.0113
Beryllium, total	7440-41-7	E420/CG	0.000020	mg/L	<0.000020	0.000567	<0.000100 DLDS	<0.000020	<0.000100 DLDS
Bismuth, total	7440-69-9	E420/CG	0.000050	mg/L	<0.000050	<0.000250 DLDS	<0.000250 DLDS	<0.000050	<0.000250 DLDS
Boron, total	7440-42-8	E420/CG	0.010	mg/L	0.682	0.838	0.289	0.671	0.812

Analytical Results

Sub-Matrix: Water (Matrix: Water)				Client sample ID	MW-36A	DUP A	DUP B	DUP C	DUP D
				Client sampling date / time	16-Jun-2023 09:45	[15-Jun-2023]	[15-Jun-2023]	[15-Jun-2023]	[15-Jun-2023]
Analyte	CAS Number	Method/Lab	LOR	Unit	EO2304968-042	EO2304968-043	EO2304968-044	EO2304968-045	EO2304968-046
					Result	Result	Result	Result	Result
Total Metals									
Cadmium, total	7440-43-9	E420/CG	0.0000050	mg/L	0.0000240	0.000625	0.000172	0.0000215	<0.0000250 DLDS
Calcium, total	7440-70-2	E420/CG	0.050	mg/L	3.16	14.5	25.1	3.09	13.6
Cesium, total	7440-46-2	E420/CG	0.000010	mg/L	0.000017	0.00178	0.000177	0.000016	0.000092
Chromium, total	7440-47-3	E420/CG	0.00050	mg/L	<0.00050	0.0642	0.00363	<0.00050	<0.00050
Cobalt, total	7440-48-4	E420/CG	0.00010	mg/L	0.00063	0.00776	0.00067	0.00034	<0.00050 DLDS
Copper, total	7440-50-8	E420/CG	0.00050	mg/L	0.00120	0.0352	<0.00250 DLDS	0.00094	<0.00250 DLDS
Iron, total	7439-89-6	E420/CG	0.010	mg/L	0.241	13.4	1.68	0.232	0.375
Lead, total	7439-92-1	E420/CG	0.000050	mg/L	0.000380	0.00993	0.00139	0.000337	<0.000250 DLDS
Lithium, total	7439-93-2	E420/CG	0.0010	mg/L	0.0745	0.141	0.316	0.0735	0.158
Magnesium, total	7439-95-4	E420/CG	0.0050	mg/L	0.420	4.08	7.77	0.410	1.29
Manganese, total	7439-96-5	E420/CG	0.00010	mg/L	0.189	0.480	0.0661	0.189	0.0283
Mercury, total	7439-97-6	E508/CG	0.0000050	mg/L	<0.0000050	0.0000922 RRV	<0.0000050	<0.0000050	<0.0000050
Molybdenum, total	7439-98-7	E420/CG	0.000050	mg/L	0.0119	0.00574	0.00104	0.0116	0.00193
Nickel, total	7440-02-0	E420/CG	0.00050	mg/L	0.00106	0.0470	0.00293	0.00090	<0.00250 DLDS
Phosphorus, total	7723-14-0	E420/CG	0.050	mg/L	0.193 DTC	0.483	<0.250 DLDS	0.194 DTC	<0.250 DLDS
Potassium, total	7440-09-7	E420/CG	0.050	mg/L	1.43	3.78	5.07	1.45	2.87
Rubidium, total	7440-17-7	E420/CG	0.00020	mg/L	0.00218	0.0237	0.00929	0.00220	0.00492
Selenium, total	7782-49-2	E420/CG	0.000050	mg/L	<0.000050	0.00103	<0.000250 DLDS	0.000059	<0.000250 DLDS
Silicon, total	7440-21-3	E420/CG	0.10	mg/L	4.18	19.6	6.38	4.12	5.26
Silver, total	7440-22-4	E420/CG	0.000010	mg/L	<0.000010	0.000144	<0.000050 DLDS	<0.000010	<0.000050 DLDS
Sodium, total	7440-23-5	E420/CG	0.050	mg/L	447	559	774	444	839
Strontium, total	7440-24-6	E420/CG	0.00020	mg/L	0.0670	0.245	0.415	0.0642	0.325
Sulfur, total	7704-34-9	E420/CG	0.50	mg/L	<0.50	53.3	315	<0.50	406
Tellurium, total	13494-80-9	E420/CG	0.00020	mg/L	<0.00020	<0.00100 DLDS	<0.00100 DLDS	<0.00020	<0.00100 DLDS
Thallium, total	7440-28-0	E420/CG	0.000010	mg/L	<0.000010	0.000156	<0.000050 DLDS	<0.000010	<0.000050 DLDS
Thorium, total	7440-29-1	E420/CG	0.00010	mg/L	<0.00010	0.00212	<0.00050 DLDS	<0.00010	<0.00050 DLDS
Tin, total	7440-31-5	E420/CG	0.00010	mg/L	0.00010	<0.00050 DLDS	<0.00050 DLDS	0.00011	<0.00050 DLDS
Titanium, total	7440-32-6	E420/CG	0.00030	mg/L	0.00301	0.0378	0.0115	0.00326	0.00657
Tungsten, total	7440-33-7	E420/CG	0.00010	mg/L	0.00054	<0.00050 DLDS	<0.00050 DLDS	0.00054	<0.00050 DLDS
Uranium, total	7440-61-1	E420/CG	0.000010	mg/L	0.000199	0.00235	0.00198	0.000201	0.000359

Analytical Results

Sub-Matrix: **Water**
(Matrix: **Water**)

				Client sample ID	MW-36A	DUP A	DUP B	DUP C	DUP D
				Client sampling date / time	16-Jun-2023 09:45	[15-Jun-2023]	[15-Jun-2023]	[15-Jun-2023]	[15-Jun-2023]
Analyte	CAS Number	Method/Lab	LOR	Unit	EO2304968-042	EO2304968-043	EO2304968-044	EO2304968-045	EO2304968-046
					Result	Result	Result	Result	Result
Total Metals									
Vanadium, total	7440-62-2	E420/CG	0.00050	mg/L	0.00078	0.0179	0.00253 DLDS	0.00067	<0.00250 DLDS
Zinc, total	7440-66-6	E420/CG	0.0030	mg/L	0.0063	0.0652	<0.0150 DLDS	0.0047	<0.0150 DLDS
Zirconium, total	7440-67-7	E420/CG	0.00020	mg/L	0.00054	<0.00100 DLDS	<0.00100 DLDS	0.00055	<0.00100 DLDS
Dissolved Metals									
Aluminum, dissolved	7429-90-5	E421/CG	0.0010	mg/L	0.0052	0.0170	0.0056	0.0053	0.0078
Antimony, dissolved	7440-36-0	E421/CG	0.00010	mg/L	<0.00010	<0.00050 DLDS	<0.00050 DLDS	<0.00010	<0.00050 DLDS
Arsenic, dissolved	7440-38-2	E421/CG	0.00010	mg/L	0.00114	0.00142	0.00078	0.00117	0.00073
Barium, dissolved	7440-39-3	E421/CG	0.00010	mg/L	0.0747	0.0446	0.00968	0.0723	0.00892
Beryllium, dissolved	7440-41-7	E421/CG	0.000020	mg/L	<0.000020	<0.000100 DLDS	<0.000100 DLDS	<0.000020	<0.000100 DLDS
Bismuth, dissolved	7440-69-9	E421/CG	0.000050	mg/L	<0.000050	<0.000250 DLDS	<0.000250 DLDS	<0.000050	<0.000250 DLDS
Boron, dissolved	7440-42-8	E421/CG	0.010	mg/L	0.661	0.703	0.196	0.640	0.821
Cadmium, dissolved	7440-43-9	E421/CG	0.0000050	mg/L	<0.0000050	0.0000370	<0.0000250 DLDS	0.0000053	<0.0000250 DLDS
Calcium, dissolved	7440-70-2	E421/CG	0.050	mg/L	2.96	6.90	22.8	2.94	13.6
Cesium, dissolved	7440-46-2	E421/CG	0.000010	mg/L	<0.000010	0.000051	<0.000050 DLDS	<0.000010	0.000071
Chromium, dissolved	7440-47-3	E421/CG	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Cobalt, dissolved	7440-48-4	E421/CG	0.00010	mg/L	0.00027	<0.00050 DLDS	<0.00050 DLDS	0.00027	<0.00050 DLDS
Copper, dissolved	7440-50-8	E421/CG	0.00020	mg/L	0.00030	0.00146	<0.00100 DLDS	0.00031	<0.00100 DLDS
Iron, dissolved	7439-89-6	E421/CG	0.010	mg/L	0.086	<0.050 DLDS	<0.050 DLDS	0.084	<0.050 DLDS
Lead, dissolved	7439-92-1	E421/CG	0.000050	mg/L	0.000081	<0.000250 DLDS	<0.000250 DLDS	0.000079	<0.000250 DLDS
Lithium, dissolved	7439-93-2	E421/CG	0.0010	mg/L	0.0783	0.124	0.313	0.0769	0.164
Magnesium, dissolved	7439-95-4	E421/CG	0.0050	mg/L	0.396	0.872	7.60	0.395	1.24
Manganese, dissolved	7439-96-5	E421/CG	0.00010	mg/L	0.179	0.0561	0.00234	0.176	0.0220
Mercury, dissolved	7439-97-6	E509/EO	0.0000050	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Molybdenum, dissolved	7439-98-7	E421/CG	0.000050	mg/L	0.0122	0.00760	0.00100	0.0124	0.00180
Nickel, dissolved	7440-02-0	E421/CG	0.00050	mg/L	0.00057	0.00714	<0.00250 DLDS	0.00053	<0.00250 DLDS
Phosphorus, dissolved	7723-14-0	E421/CG	0.050	mg/L	0.313 DTC	<0.250 DLDS	<0.250 DLDS	0.319 DTC	<0.250 DLDS
Potassium, dissolved	7440-09-7	E421/CG	0.050	mg/L	1.48	1.98	4.96	1.46	2.73
Rubidium, dissolved	7440-17-7	E421/CG	0.00020	mg/L	0.00196	0.00364	0.00734	0.00215	0.00511
Selenium, dissolved	7782-49-2	E421/CG	0.000050	mg/L	0.000068	<0.000250 DLDS	<0.000250 DLDS	<0.000050	<0.000250 DLDS
Silicon, dissolved	7440-21-3	E421/CG	0.050	mg/L	4.13	3.32	4.25	4.07	4.78

Analytical Results

Sub-Matrix: Water (Matrix: Water)				Client sample ID	MW-36A	DUP A	DUP B	DUP C	DUP D
				Client sampling date / time	16-Jun-2023 09:45	[15-Jun-2023]	[15-Jun-2023]	[15-Jun-2023]	[15-Jun-2023]
Analyte	CAS Number	Method/Lab	LOR	Unit	EO2304968-042	EO2304968-043	EO2304968-044	EO2304968-045	EO2304968-046
					Result	Result	Result	Result	Result
Dissolved Metals									
Silver, dissolved	7440-22-4	E421/CG	0.000010	mg/L	<0.000010	<0.000050 DLDS	<0.000050 DLDS	<0.000010	<0.000050 DLDS
Sodium, dissolved	7440-23-5	E421/CG	0.050	mg/L	438	550	754	434	828
Strontium, dissolved	7440-24-6	E421/CG	0.00020	mg/L	0.0647	0.164	0.427	0.0659	0.332
Sulfur, dissolved	7704-34-9	E421/CG	0.50	mg/L	<0.50	50.8	288	<0.50	414
Tellurium, dissolved	13494-80-9	E421/CG	0.00020	mg/L	<0.00020	<0.00100 DLDS	<0.00100 DLDS	<0.00020	<0.00100 DLDS
Thallium, dissolved	7440-28-0	E421/CG	0.000010	mg/L	<0.000010	<0.000050 DLDS	<0.000050 DLDS	<0.000010	<0.000050 DLDS
Thorium, dissolved	7440-29-1	E421/CG	0.00010	mg/L	<0.00010	<0.00050 DLDS	<0.00050 DLDS	0.00013	<0.00050 DLDS
Tin, dissolved	7440-31-5	E421/CG	0.00010	mg/L	<0.00010	<0.00050 DLDS	<0.00050 DLDS	<0.00010	<0.00050 DLDS
Titanium, dissolved	7440-32-6	E421/CG	0.00030	mg/L	<0.00030	<0.00150 DLDS	<0.00150 DLDS	<0.00030	<0.00150 DLDS
Tungsten, dissolved	7440-33-7	E421/CG	0.00010	mg/L	0.00055	<0.00050 DLDS	<0.00050 DLDS	0.00054	<0.00050 DLDS
Uranium, dissolved	7440-61-1	E421/CG	0.000010	mg/L	0.000184	0.00136	0.00209	0.000180	0.000347
Vanadium, dissolved	7440-62-2	E421/CG	0.00050	mg/L	<0.00050	<0.00250 DLDS	<0.00250 DLDS	<0.00050	<0.00250 DLDS
Zinc, dissolved	7440-66-6	E421/CG	0.0010	mg/L	0.0014	<0.0050 DLDS	<0.0050 DLDS	0.0012	<0.0050 DLDS
Zirconium, dissolved	7440-67-7	E421/CG	0.00020	mg/L	0.00074	<0.00100 DLDS	<0.00100 DLDS	0.00073	<0.00100 DLDS
Dissolved mercury filtration location	----	EP509/EO	-	-	Field	Field	Field	Field	Field
Dissolved metals filtration location	----	EP421/CG	-	-	Field	Field	Field	Field	Field
Aggregate Organics									
Phenols, total (4AAP)	----	E562/EO	0.0010	mg/L	<0.0010	<0.0010	<0.0010 RRV	<0.0010	<0.0010
Volatile Organic Compounds									
Benzene	71-43-2	E611E/EO	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50
Benzene	71-43-2	E611A/EO	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Bromobenzene	108-86-1	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Bromochloromethane	74-97-5	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Bromodichloromethane	75-27-4	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Bromoform	75-25-2	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Bromomethane	74-83-9	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Butylbenzene, n-	104-51-8	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Butylbenzene, sec-	135-98-8	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Butylbenzene, tert-	98-06-6	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Carbon tetrachloride	56-23-5	E611E/EO	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50

Analytical Results

Sub-Matrix: Water (Matrix: Water)				Client sample ID	MW-36A	DUP A	DUP B	DUP C	DUP D
				Client sampling date / time	16-Jun-2023 09:45	[15-Jun-2023]	[15-Jun-2023]	[15-Jun-2023]	[15-Jun-2023]
Analyte	CAS Number	Method/Lab	LOR	Unit	EO2304968-042	EO2304968-043	EO2304968-044	EO2304968-045	EO2304968-046
					Result	Result	Result	Result	Result
Volatile Organic Compounds									
Chlorobenzene	108-90-7	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Chloroethane	75-00-3	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Chloroform	67-66-3	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Chloromethane	74-87-3	E611E/EO	5.0	µg/L	<5.0	<5.0	<5.0	<5.0	<5.0
Chlorotoluene, 2-	95-49-8	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Chlorotoluene, 4-	106-43-4	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Cymene, p-	99-87-6	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dibromo-3-chloropropane, 1,2-	96-12-8	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dibromochloromethane	124-48-1	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dibromoethane, 1,2-	106-93-4	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dibromomethane	74-95-3	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichlorobenzene, 1,2-	95-50-1	E611E/EO	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50
Dichlorobenzene, 1,3-	541-73-1	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichlorobenzene, 1,4-	106-46-7	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichlorodifluoromethane	75-71-8	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloroethane, 1,1-	75-34-3	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloroethane, 1,2-	107-06-2	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloroethylene, 1,1-	75-35-4	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloroethylene, cis-1,2-	156-59-2	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloroethylene, trans-1,2-	156-60-5	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloromethane	75-09-2	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloropropane, 1,2-	78-87-5	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloropropane, 1,3-	142-28-9	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloropropane, 2,2-	594-20-7	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloropropylene, 1,1-	563-58-6	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloropropylene, cis+trans-1,3-	542-75-6	E611E/EO	1.5	µg/L	<1.5	<1.5	<1.5	<1.5	<1.5
Dichloropropylene, cis-1,3-	10061-01-5	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloropropylene, trans-1,3-	10061-02-6	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Ethylbenzene	100-41-4	E611E/EO	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50
Ethylbenzene	100-41-4	E611A/EO	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050

Analytical Results

Sub-Matrix: Water (Matrix: Water)				Client sample ID	MW-36A	DUP A	DUP B	DUP C	DUP D
				Client sampling date / time	16-Jun-2023 09:45	[15-Jun-2023]	[15-Jun-2023]	[15-Jun-2023]	[15-Jun-2023]
Analyte	CAS Number	Method/Lab	LOR	Unit	EO2304968-042	EO2304968-043	EO2304968-044	EO2304968-045	EO2304968-046
					Result	Result	Result	Result	Result
Volatile Organic Compounds									
Hexachlorobutadiene	87-68-3	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Isopropylbenzene	98-82-8	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Methyl-tert-butyl ether [MTBE]	1634-04-4	E611E/EO	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50
Propylbenzene, n-	103-65-1	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Styrene	100-42-5	E611E/EO	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50
Styrene	100-42-5	E611A/EO	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Tetrachloroethane, 1,1,1,2-	630-20-6	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Tetrachloroethane, 1,1,2,2-	79-34-5	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Tetrachloroethylene	127-18-4	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Toluene	108-88-3	E611E/EO	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50
Toluene	108-88-3	E611A/EO	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Trichlorobenzene, 1,2,3-	87-61-6	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Trichlorobenzene, 1,2,4-	120-82-1	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Trichloroethane, 1,1,1-	71-55-6	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Trichloroethane, 1,1,2-	79-00-5	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Trichloroethylene	79-01-6	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Trichlorofluoromethane	75-69-4	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Trichloropropane, 1,2,3-	96-18-4	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Trimethylbenzene, 1,2,4-	95-63-6	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Trimethylbenzene, 1,3,5-	108-67-8	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Vinyl chloride	75-01-4	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Xylene, m+p-	179601-23-1	E611E/EO	0.40	µg/L	<0.40	<0.40	<0.40	<0.40	<0.40
Xylene, m+p-	179601-23-1	E611A/EO	0.00040	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene, o-	95-47-6	E611E/EO	0.30	µg/L	<0.30	<0.30	<0.30	<0.30	<0.30
Xylene, o-	95-47-6	E611A/EO	0.00030	mg/L	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Xylenes, total	1330-20-7	E611E/EO	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50
Xylenes, total	1330-20-7	E611A/EO	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
BTEX, total	----	E611E/EO	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Trihalomethanes [THMs], total	----	E611E/EO	2.0	µg/L	<2.0	<2.0	<2.0	<2.0	<2.0
Hydrocarbons									

Analytical Results

Sub-Matrix: Water (Matrix: Water)				Client sample ID	MW-36A	DUP A	DUP B	DUP C	DUP D
				Client sampling date / time	16-Jun-2023 09:45	[15-Jun-2023]	[15-Jun-2023]	[15-Jun-2023]	[15-Jun-2023]
Analyte	CAS Number	Method/Lab	LOR	Unit	EO2304968-042	EO2304968-043	EO2304968-044	EO2304968-045	EO2304968-046
					Result	Result	Result	Result	Result
Hydrocarbons									
F1 (C6-C10)	----	E581.F1/EO	0.10	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (C10-C16)	----	E601/EO	0.10	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10
F1-BTEX	----	EC580/EO	0.100	mg/L	<0.100	<0.100	<0.100	<0.100	<0.100
Hydrocarbons Surrogates									
Bromobenzotrifluoride, 2- (F2-F4 surrogate)	392-83-6	E601/EO	1.0	%	101	102	101	101	102
Dichlorotoluene, 3,4-	95-75-0	E581.F1/EO	1.0	%	126	103	114	111	123
Volatile Organic Compounds Surrogates									
Bromofluorobenzene, 4-	460-00-4	E611A/EO	1.0	%	91.8	91.8	90.3	88.7	88.1
Bromofluorobenzene, 4-	460-00-4	E611E/EO	1.0	%	91.8	91.8	90.3	88.7	88.1
Difluorobenzene, 1,4-	540-36-3	E611A/EO	1.0	%	83.9	103	86.9	92.7	85.2
Difluorobenzene, 1,4-	540-36-3	E611E/EO	1.0	%	83.9	103	86.9	92.7	85.2

Please refer to the General Comments section for an explanation of any result qualifiers detected.

Please refer to the Accreditation section for an explanation of analyte accreditations.

Analytical Results

Sub-Matrix: Water (Matrix: Water)				Client sample ID	TRIP BLANK	FIELD BLANK	----	----	----
				Client sampling date / time	[15-Jun-2023]	[15-Jun-2023]	----	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit	EO2304968-047	EO2304968-048	--------	--------	--------
					Result	Result	----	----	----
Physical Tests									
Alkalinity, bicarbonate (as HCO3)	71-52-3	E290/CG	1.0	mg/L	<1.0	<1.0	----	----	----
Alkalinity, carbonate (as CO3)	3812-32-6	E290/CG	1.0	mg/L	<1.0	<1.0	----	----	----
Alkalinity, hydroxide (as OH)	14280-30-9	E290/CG	1.0	mg/L	<1.0	<1.0	----	----	----
Alkalinity, total (as CaCO3)	----	E290/CG	1.0	mg/L	<1.0	<1.0	----	----	----
Conductivity	----	E100/CG	1.0	µS/cm	<1.0	<1.0	----	----	----
Hardness (as CaCO3), dissolved	----	EC100/CG	0.50	mg/L	<0.50	<0.50	----	----	----
pH	----	E108/CG	0.10	pH units	5.17	5.18	----	----	----
Solids, total dissolved [TDS], calculated	----	EC103/CG	1.0	mg/L	<1.0	4.6	----	----	----
Anions and Nutrients									
Ammonia, total (as N)	7664-41-7	E298/EO	0.0050	mg/L	<0.0050	<0.0050	----	----	----
Chloride	16887-00-6	E235.Cl/CG	0.50	mg/L	<0.50	<0.50	----	----	----
Fluoride	16984-48-8	E235.F/CG	0.020	mg/L	<0.020	<0.020	----	----	----
Kjeldahl nitrogen, total [TKN]	----	E318/EO	0.050	mg/L	<0.050	<0.050	----	----	----
Nitrate (as N)	14797-55-8	E235.NO3/CG	0.020	mg/L	<0.020	<0.020	----	----	----
Nitrate + Nitrite (as N)	----	EC235.N+N/CG	0.0032	mg/L	<0.0224	<0.0224	----	----	----
Nitrite (as N)	14797-65-0	E235.NO2/CG	0.010	mg/L	<0.010	<0.010	----	----	----
Sulfate (as SO4)	14808-79-8	E235.SO4/CG	0.30	mg/L	<0.30	<0.30	----	----	----
Organic / Inorganic Carbon									
Carbon, dissolved organic [DOC]	----	E358-L/CG	0.50	mg/L	<0.50	4.21 RRV	----	----	----
Ion Balance									
Ion balance (cations/anions)	----	EC101/CG	0.010	%	100	100	----	----	----
Total Metals									
Aluminum, total	7429-90-5	E420/CG	0.0030	mg/L	<0.0030	<0.0030	----	----	----
Antimony, total	7440-36-0	E420/CG	0.00010	mg/L	<0.00010	<0.00010	----	----	----
Arsenic, total	7440-38-2	E420/CG	0.00010	mg/L	<0.00010	<0.00010	----	----	----
Barium, total	7440-39-3	E420/CG	0.00010	mg/L	<0.00010	0.00014 RRV	----	----	----
Beryllium, total	7440-41-7	E420/CG	0.000020	mg/L	<0.000020	<0.000020	----	----	----
Bismuth, total	7440-69-9	E420/CG	0.000050	mg/L	<0.000050	<0.000050	----	----	----
Boron, total	7440-42-8	E420/CG	0.010	mg/L	<0.010	<0.010	----	----	----
Cadmium, total	7440-43-9	E420/CG	0.0000050	mg/L	<0.0000050	<0.0000050	----	----	----

Analytical Results

Sub-Matrix: Water (Matrix: Water)				Client sample ID	TRIP BLANK	FIELD BLANK	----	----	----
				Client sampling date / time	[15-Jun-2023]	[15-Jun-2023]	----	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit	EO2304968-047	EO2304968-048	--------	--------	--------
					Result	Result	----	----	----
Total Metals									
Calcium, total	7440-70-2	E420/CG	0.050	mg/L	<0.050	<0.050	----	----	----
Cesium, total	7440-46-2	E420/CG	0.000010	mg/L	<0.000010	<0.000010	----	----	----
Chromium, total	7440-47-3	E420/CG	0.00050	mg/L	<0.00050	<0.00050	----	----	----
Cobalt, total	7440-48-4	E420/CG	0.00010	mg/L	<0.00010	<0.00010	----	----	----
Copper, total	7440-50-8	E420/CG	0.00050	mg/L	<0.00050	<0.00050	----	----	----
Iron, total	7439-89-6	E420/CG	0.010	mg/L	<0.010	<0.010	----	----	----
Lead, total	7439-92-1	E420/CG	0.000050	mg/L	<0.000050	<0.000050	----	----	----
Lithium, total	7439-93-2	E420/CG	0.0010	mg/L	<0.0010	<0.0010	----	----	----
Magnesium, total	7439-95-4	E420/CG	0.0050	mg/L	<0.0050	<0.0050	----	----	----
Manganese, total	7439-96-5	E420/CG	0.00010	mg/L	<0.00010	<0.00010	----	----	----
Mercury, total	7439-97-6	E508/CG	0.0000050	mg/L	<0.0000050	<0.0000050	----	----	----
Molybdenum, total	7439-98-7	E420/CG	0.000050	mg/L	<0.000050	<0.000050	----	----	----
Nickel, total	7440-02-0	E420/CG	0.00050	mg/L	<0.00050	<0.00050	----	----	----
Phosphorus, total	7723-14-0	E420/CG	0.050	mg/L	<0.050	<0.050	----	----	----
Potassium, total	7440-09-7	E420/CG	0.050	mg/L	<0.050	<0.050	----	----	----
Rubidium, total	7440-17-7	E420/CG	0.00020	mg/L	<0.00020	<0.00020	----	----	----
Selenium, total	7782-49-2	E420/CG	0.000050	mg/L	<0.000050	<0.000050	----	----	----
Silicon, total	7440-21-3	E420/CG	0.10	mg/L	<0.10	<0.10	----	----	----
Silver, total	7440-22-4	E420/CG	0.000010	mg/L	<0.000010	<0.000010	----	----	----
Sodium, total	7440-23-5	E420/CG	0.050	mg/L	<0.050	<0.050	----	----	----
Strontium, total	7440-24-6	E420/CG	0.00020	mg/L	<0.00020	<0.00020	----	----	----
Sulfur, total	7704-34-9	E420/CG	0.50	mg/L	<0.50	<0.50	----	----	----
Tellurium, total	13494-80-9	E420/CG	0.00020	mg/L	<0.00020	<0.00020	----	----	----
Thallium, total	7440-28-0	E420/CG	0.000010	mg/L	<0.000010	<0.000010	----	----	----
Thorium, total	7440-29-1	E420/CG	0.00010	mg/L	<0.00010	<0.00010	----	----	----
Tin, total	7440-31-5	E420/CG	0.00010	mg/L	<0.00010	<0.00010	----	----	----
Titanium, total	7440-32-6	E420/CG	0.00030	mg/L	<0.00030	<0.00030	----	----	----
Tungsten, total	7440-33-7	E420/CG	0.00010	mg/L	<0.00010	<0.00010	----	----	----
Uranium, total	7440-61-1	E420/CG	0.000010	mg/L	<0.000010	<0.000010	----	----	----
Vanadium, total	7440-62-2	E420/CG	0.00050	mg/L	<0.00050	<0.00050	----	----	----
Zinc, total	7440-66-6	E420/CG	0.0030	mg/L	<0.0030	<0.0030	----	----	----

Analytical Results

Sub-Matrix: Water (Matrix: Water)				Client sample ID	TRIP BLANK	FIELD BLANK	----	----	----
				Client sampling date / time	[15-Jun-2023]	[15-Jun-2023]	----	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit	EO2304968-047	EO2304968-048	--------	--------	--------
					Result	Result	----	----	----
Total Metals									
Zirconium, total	7440-67-7	E420/CG	0.00020	mg/L	<0.00020	<0.00020	----	----	----
Dissolved Metals									
Aluminum, dissolved	7429-90-5	E421/CG	0.0010	mg/L	<0.0010	<0.0010	----	----	----
Antimony, dissolved	7440-36-0	E421/CG	0.00010	mg/L	<0.00010	<0.00010	----	----	----
Arsenic, dissolved	7440-38-2	E421/CG	0.00010	mg/L	<0.00010	<0.00010	----	----	----
Barium, dissolved	7440-39-3	E421/CG	0.00010	mg/L	<0.00010	<0.00010	----	----	----
Beryllium, dissolved	7440-41-7	E421/CG	0.000020	mg/L	<0.000020	<0.000020	----	----	----
Bismuth, dissolved	7440-69-9	E421/CG	0.000050	mg/L	<0.000050	<0.000050	----	----	----
Boron, dissolved	7440-42-8	E421/CG	0.010	mg/L	<0.010	<0.010	----	----	----
Cadmium, dissolved	7440-43-9	E421/CG	0.0000050	mg/L	<0.0000050	<0.0000050	----	----	----
Calcium, dissolved	7440-70-2	E421/CG	0.050	mg/L	<0.050	<0.050	----	----	----
Cesium, dissolved	7440-46-2	E421/CG	0.000010	mg/L	<0.000010	<0.000010	----	----	----
Chromium, dissolved	7440-47-3	E421/CG	0.00050	mg/L	<0.00050	<0.00050	----	----	----
Cobalt, dissolved	7440-48-4	E421/CG	0.00010	mg/L	<0.00010	<0.00010	----	----	----
Copper, dissolved	7440-50-8	E421/CG	0.00020	mg/L	<0.00020	0.00035 RRV	----	----	----
Iron, dissolved	7439-89-6	E421/CG	0.010	mg/L	<0.010	<0.010	----	----	----
Lead, dissolved	7439-92-1	E421/CG	0.000050	mg/L	<0.000050	<0.000050	----	----	----
Lithium, dissolved	7439-93-2	E421/CG	0.0010	mg/L	<0.0010	<0.0010	----	----	----
Magnesium, dissolved	7439-95-4	E421/CG	0.0050	mg/L	<0.0050	<0.0050	----	----	----
Manganese, dissolved	7439-96-5	E421/CG	0.00010	mg/L	<0.00010	<0.00010	----	----	----
Mercury, dissolved	7439-97-6	E509/EO	0.0000050	mg/L	<0.0000050	<0.0000050	----	----	----
Molybdenum, dissolved	7439-98-7	E421/CG	0.000050	mg/L	<0.000050	<0.000050	----	----	----
Nickel, dissolved	7440-02-0	E421/CG	0.00050	mg/L	<0.00050	<0.00050	----	----	----
Phosphorus, dissolved	7723-14-0	E421/CG	0.050	mg/L	<0.050	<0.050	----	----	----
Potassium, dissolved	7440-09-7	E421/CG	0.050	mg/L	<0.050	<0.050	----	----	----
Rubidium, dissolved	7440-17-7	E421/CG	0.00020	mg/L	<0.00020	<0.00020	----	----	----
Selenium, dissolved	7782-49-2	E421/CG	0.000050	mg/L	<0.000050	<0.000050	----	----	----
Silicon, dissolved	7440-21-3	E421/CG	0.050	mg/L	<0.050	0.070 RRV	----	----	----
Silver, dissolved	7440-22-4	E421/CG	0.000010	mg/L	<0.000010	<0.000010	----	----	----
Sodium, dissolved	7440-23-5	E421/CG	0.050	mg/L	<0.050	0.255 RRV	----	----	----
Strontium, dissolved	7440-24-6	E421/CG	0.00020	mg/L	<0.00020	<0.00020	----	----	----

Analytical Results

Sub-Matrix: Water (Matrix: Water)				Client sample ID	TRIP BLANK	FIELD BLANK	----	----	----
				Client sampling date / time	[15-Jun-2023]	[15-Jun-2023]	----	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit	EO2304968-047	EO2304968-048	--------	--------	--------
					Result	Result	----	----	----
Dissolved Metals									
Sulfur, dissolved	7704-34-9	E421/CG	0.50	mg/L	<0.50	<0.50	----	----	----
Tellurium, dissolved	13494-80-9	E421/CG	0.00020	mg/L	<0.00020	<0.00020	----	----	----
Thallium, dissolved	7440-28-0	E421/CG	0.000010	mg/L	<0.000010	<0.000010	----	----	----
Thorium, dissolved	7440-29-1	E421/CG	0.00010	mg/L	<0.00010	<0.00010	----	----	----
Tin, dissolved	7440-31-5	E421/CG	0.00010	mg/L	<0.00010	<0.00010	----	----	----
Titanium, dissolved	7440-32-6	E421/CG	0.00030	mg/L	<0.00030	<0.00030	----	----	----
Tungsten, dissolved	7440-33-7	E421/CG	0.00010	mg/L	<0.00010	<0.00010	----	----	----
Uranium, dissolved	7440-61-1	E421/CG	0.000010	mg/L	<0.000010	<0.000010	----	----	----
Vanadium, dissolved	7440-62-2	E421/CG	0.00050	mg/L	<0.00050	<0.00050	----	----	----
Zinc, dissolved	7440-66-6	E421/CG	0.0010	mg/L	<0.0010	<0.0010	----	----	----
Zirconium, dissolved	7440-67-7	E421/CG	0.00020	mg/L	<0.00020	<0.00020	----	----	----
Dissolved mercury filtration location	----	EP509/EO	-	-	Field	Field	----	----	----
Dissolved metals filtration location	----	EP421/CG	-	-	Field	Field	----	----	----
Aggregate Organics									
Phenols, total (4AAP)	----	E562/EO	0.0010	mg/L	<0.0010	<0.0010	----	----	----
Volatile Organic Compounds									
Benzene	71-43-2	E611E/EO	0.50	µg/L	<0.50	<0.50	----	----	----
Benzene	71-43-2	E611A/EO	0.00050	mg/L	<0.00050	<0.00050	----	----	----
Bromobenzene	108-86-1	E611E/EO	1.0	µg/L	<1.0	<1.0	----	----	----
Bromochloromethane	74-97-5	E611E/EO	1.0	µg/L	<1.0	<1.0	----	----	----
Bromodichloromethane	75-27-4	E611E/EO	1.0	µg/L	<1.0	<1.0	----	----	----
Bromoform	75-25-2	E611E/EO	1.0	µg/L	<1.0	<1.0	----	----	----
Bromomethane	74-83-9	E611E/EO	1.0	µg/L	<1.0	<1.0	----	----	----
Butylbenzene, n-	104-51-8	E611E/EO	1.0	µg/L	<1.0	<1.0	----	----	----
Butylbenzene, sec-	135-98-8	E611E/EO	1.0	µg/L	<1.0	<1.0	----	----	----
Butylbenzene, tert-	98-06-6	E611E/EO	1.0	µg/L	<1.0	<1.0	----	----	----
Carbon tetrachloride	56-23-5	E611E/EO	0.50	µg/L	<0.50	<0.50	----	----	----
Chlorobenzene	108-90-7	E611E/EO	1.0	µg/L	<1.0	<1.0	----	----	----
Chloroethane	75-00-3	E611E/EO	1.0	µg/L	<1.0	<1.0	----	----	----
Chloroform	67-66-3	E611E/EO	1.0	µg/L	1.3	<1.0	----	----	----
Chloromethane	74-87-3	E611E/EO	5.0	µg/L	<5.0	<5.0	----	----	----

Analytical Results

Sub-Matrix: Water (Matrix: Water)				Client sample ID	TRIP BLANK	FIELD BLANK	----	----	----
				Client sampling date / time	[15-Jun-2023]	[15-Jun-2023]	----	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit	EO2304968-047	EO2304968-048	--------	--------	--------
					Result	Result	----	----	----
Volatile Organic Compounds									
Chlorotoluene, 2-	95-49-8	E611E/EO	1.0	µg/L	<1.0	<1.0	----	----	----
Chlorotoluene, 4-	106-43-4	E611E/EO	1.0	µg/L	<1.0	<1.0	----	----	----
Cymene, p-	99-87-6	E611E/EO	1.0	µg/L	<1.0	<1.0	----	----	----
Dibromo-3-chloropropane, 1,2-	96-12-8	E611E/EO	1.0	µg/L	<1.0	<1.0	----	----	----
Dibromochloromethane	124-48-1	E611E/EO	1.0	µg/L	<1.0	<1.0	----	----	----
Dibromoethane, 1,2-	106-93-4	E611E/EO	1.0	µg/L	<1.0	<1.0	----	----	----
Dibromomethane	74-95-3	E611E/EO	1.0	µg/L	<1.0	<1.0	----	----	----
Dichlorobenzene, 1,2-	95-50-1	E611E/EO	0.50	µg/L	<0.50	<0.50	----	----	----
Dichlorobenzene, 1,3-	541-73-1	E611E/EO	1.0	µg/L	<1.0	<1.0	----	----	----
Dichlorobenzene, 1,4-	106-46-7	E611E/EO	1.0	µg/L	<1.0	<1.0	----	----	----
Dichlorodifluoromethane	75-71-8	E611E/EO	1.0	µg/L	<1.0	<1.0	----	----	----
Dichloroethane, 1,1-	75-34-3	E611E/EO	1.0	µg/L	<1.0	<1.0	----	----	----
Dichloroethane, 1,2-	107-06-2	E611E/EO	1.0	µg/L	<1.0	<1.0	----	----	----
Dichloroethylene, 1,1-	75-35-4	E611E/EO	1.0	µg/L	<1.0	<1.0	----	----	----
Dichloroethylene, cis-1,2-	156-59-2	E611E/EO	1.0	µg/L	<1.0	<1.0	----	----	----
Dichloroethylene, trans-1,2-	156-60-5	E611E/EO	1.0	µg/L	<1.0	<1.0	----	----	----
Dichloromethane	75-09-2	E611E/EO	1.0	µg/L	<1.0	<1.0	----	----	----
Dichloropropane, 1,2-	78-87-5	E611E/EO	1.0	µg/L	<1.0	<1.0	----	----	----
Dichloropropane, 1,3-	142-28-9	E611E/EO	1.0	µg/L	<1.0	<1.0	----	----	----
Dichloropropane, 2,2-	594-20-7	E611E/EO	1.0	µg/L	<1.0	<1.0	----	----	----
Dichloropropylene, 1,1-	563-58-6	E611E/EO	1.0	µg/L	<1.0	<1.0	----	----	----
Dichloropropylene, cis+trans-1,3-	542-75-6	E611E/EO	1.5	µg/L	<1.5	<1.5	----	----	----
Dichloropropylene, cis-1,3-	10061-01-5	E611E/EO	1.0	µg/L	<1.0	<1.0	----	----	----
Dichloropropylene, trans-1,3-	10061-02-6	E611E/EO	1.0	µg/L	<1.0	<1.0	----	----	----
Ethylbenzene	100-41-4	E611E/EO	0.50	µg/L	<0.50	<0.50	----	----	----
Ethylbenzene	100-41-4	E611A/EO	0.00050	mg/L	<0.00050	<0.00050	----	----	----
Hexachlorobutadiene	87-68-3	E611E/EO	1.0	µg/L	<1.0	<1.0	----	----	----
Isopropylbenzene	98-82-8	E611E/EO	1.0	µg/L	<1.0	<1.0	----	----	----
Methyl-tert-butyl ether [MTBE]	1634-04-4	E611E/EO	0.50	µg/L	<0.50	<0.50	----	----	----
Propylbenzene, n-	103-65-1	E611E/EO	1.0	µg/L	<1.0	<1.0	----	----	----
Styrene	100-42-5	E611E/EO	0.50	µg/L	<0.50	<0.50	----	----	----

Analytical Results

Sub-Matrix: Water (Matrix: Water)				Client sample ID	TRIP BLANK	FIELD BLANK	----	----	----
				Client sampling date / time	[15-Jun-2023]	[15-Jun-2023]	----	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit	EO2304968-047	EO2304968-048	--------	--------	--------
					Result	Result	----	----	----
Volatile Organic Compounds									
Styrene	100-42-5	E611A/EO	0.00050	mg/L	<0.00050	<0.00050	----	----	----
Tetrachloroethane, 1,1,1,2-	630-20-6	E611E/EO	1.0	µg/L	<1.0	<1.0	----	----	----
Tetrachloroethane, 1,1,2,2-	79-34-5	E611E/EO	1.0	µg/L	<1.0	<1.0	----	----	----
Tetrachloroethylene	127-18-4	E611E/EO	1.0	µg/L	<1.0	<1.0	----	----	----
Toluene	108-88-3	E611E/EO	0.50	µg/L	<0.50	<0.50	----	----	----
Toluene	108-88-3	E611A/EO	0.00050	mg/L	<0.00050	<0.00050	----	----	----
Trichlorobenzene, 1,2,3-	87-61-6	E611E/EO	1.0	µg/L	<1.0	<1.0	----	----	----
Trichlorobenzene, 1,2,4-	120-82-1	E611E/EO	1.0	µg/L	<1.0	<1.0	----	----	----
Trichloroethane, 1,1,1-	71-55-6	E611E/EO	1.0	µg/L	<1.0	<1.0	----	----	----
Trichloroethane, 1,1,2-	79-00-5	E611E/EO	1.0	µg/L	<1.0	<1.0	----	----	----
Trichloroethylene	79-01-6	E611E/EO	1.0	µg/L	<1.0	<1.0	----	----	----
Trichlorofluoromethane	75-69-4	E611E/EO	1.0	µg/L	<1.0	<1.0	----	----	----
Trichloropropane, 1,2,3-	96-18-4	E611E/EO	1.0	µg/L	<1.0	<1.0	----	----	----
Trimethylbenzene, 1,2,4-	95-63-6	E611E/EO	1.0	µg/L	<1.0	<1.0	----	----	----
Trimethylbenzene, 1,3,5-	108-67-8	E611E/EO	1.0	µg/L	<1.0	<1.0	----	----	----
Vinyl chloride	75-01-4	E611E/EO	1.0	µg/L	<1.0	<1.0	----	----	----
Xylene, m+p-	179601-23-1	E611E/EO	0.40	µg/L	<0.40	<0.40	----	----	----
Xylene, m+p-	179601-23-1	E611A/EO	0.00040	mg/L	<0.00040	<0.00040	----	----	----
Xylene, o-	95-47-6	E611E/EO	0.30	µg/L	<0.30	<0.30	----	----	----
Xylene, o-	95-47-6	E611A/EO	0.00030	mg/L	<0.00030	<0.00030	----	----	----
Xylenes, total	1330-20-7	E611E/EO	0.50	µg/L	<0.50	<0.50	----	----	----
Xylenes, total	1330-20-7	E611A/EO	0.00050	mg/L	<0.00050	<0.00050	----	----	----
BTEX, total	----	E611E/EO	1.0	µg/L	<1.0	<1.0	----	----	----
Trihalomethanes [THMs], total	----	E611E/EO	2.0	µg/L	<2.0	<2.0	----	----	----
Hydrocarbons									
F1 (C6-C10)	----	E581.F1/EO	0.10	mg/L	<0.10	<0.10	----	----	----
F2 (C10-C16)	----	E601/EO	0.10	mg/L	<0.10	<0.10	----	----	----
F1-BTEX	----	EC580/EO	0.100	mg/L	<0.100	<0.100	----	----	----
Hydrocarbons Surrogates									
Bromobenzotrifluoride, 2- (F2-F4 surrogate)	392-83-6	E601/EO	1.0	%	100	103	----	----	----
Dichlorotoluene, 3,4-	95-75-0	E581.F1/EO	1.0	%	116	129	----	----	----

Analytical Results

Sub-Matrix: Water (Matrix: Water)				Client sample ID	TRIP BLANK	FIELD BLANK	----	----	----
			Client sampling date / time		[15-Jun-2023]	[15-Jun-2023]	----	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit	EO2304968-047	EO2304968-048	--------	--------	--------
					Result	Result	----	----	----
Volatile Organic Compounds Surrogates									
Bromofluorobenzene, 4-	460-00-4	E611A/EO	1.0	%	89.8	90.7	----	----	----
Bromofluorobenzene, 4-	460-00-4	E611E/EO	1.0	%	89.8	90.7	----	----	----
Difluorobenzene, 1,4-	540-36-3	E611A/EO	1.0	%	86.2	85.7	----	----	----
Difluorobenzene, 1,4-	540-36-3	E611E/EO	1.0	%	86.2	85.7	----	----	----

Please refer to the General Comments section for an explanation of any result qualifiers detected.

Please refer to the Accreditation section for an explanation of analyte accreditations.

ALS Canada Ltd.

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QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **EO2304968**	Page	: 1 of 105
Client	: **Tetra Tech Canada Inc.**	Laboratory	: Edmonton - Environmental
Contact	: Carl Forkheim	Account Manager	: Kieran Tordoff
Address	: North Building 14940 123 Ave NW Edmonton AB Canada T5V 1B4	Address	: 9450 - 17 Avenue NW Edmonton, Alberta Canada T6N 1M9
Telephone	: 403-510-7241	Telephone	: +1 780 413 5227
Project	: SWM.SWOP04591-03	Date Samples Received	: 16-Jun-2023 16:35
PO	: ----	Issue Date	: 27-Jun-2023 16:52
C-O-C number	: ----		
Sampler	: ----		
Site	: ----		
Quote number	: EO23-EBAE100-006 (Q83988)		
No. of samples received	: 48		
No. of samples analysed	: 47		

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

Key

Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number: Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO: Data Quality Objective.
LOR: Limit of Reporting (detection limit).
RPD: Relative Percent Difference.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- Analysis Holding Time Outliers exist - please see following pages for full details.

Outliers : Frequency of Quality Control Samples

- Quality Control Sample Frequency Outliers occur - please see following pages for full details.

Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid) MW-22A	E562	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	28 days	5 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid) MW-22B	E562	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	28 days	5 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid) MW-23A	E562	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	28 days	5 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid) MW-23B	E562	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	28 days	5 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid) MW-25A	E562	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	28 days	5 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid) MW-25B	E562	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	28 days	5 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid) MW-26A	E562	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	28 days	5 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis: Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid) MW-26B	E562	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	28 days	5 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid) MW-27A	E562	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	28 days	5 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid) MW-27B	E562	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	28 days	5 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid) MW-28A	E562	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	28 days	5 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid) MW-28B	E562	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	28 days	5 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid) MW-29A	E562	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	28 days	5 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid) MW-29B	E562	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	28 days	5 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid) MW-31A	E562	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	28 days	5 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid) MW-31B	E562	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	28 days	5 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis: Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid) MW-32A	E562	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	28 days	5 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid) MW-32B	E562	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	28 days	5 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid) MW-10	E562	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	28 days	6 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid) MW-11	E562	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	28 days	6 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid) MW-18A	E562	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	28 days	6 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid) MW-18B	E562	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	28 days	6 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid) MW-19A	E562	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	28 days	6 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid) MW-19B	E562	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	28 days	6 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid) MW-1B	E562	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	28 days	6 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis: Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid) MW-1C	E562	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	28 days	6 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid) MW-20A	E562	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	28 days	6 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid) MW-20B	E562	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	28 days	6 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid) MW-21A	E562	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	28 days	6 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid) MW-21B	E562	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	28 days	6 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid) MW-30A	E562	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	28 days	6 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid) MW-30B	E562	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	28 days	6 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid) MW-33A	E562	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	28 days	6 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid) MW-33B	E562	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	28 days	6 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis: Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid)										
MW-35A	E562	16-Jun-2023	22-Jun-2023	----	----		22-Jun-2023	28 days	6 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid)										
MW-35B	E562	16-Jun-2023	22-Jun-2023	----	----		22-Jun-2023	28 days	6 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid)										
MW-35-DEEP	E562	16-Jun-2023	22-Jun-2023	----	----		22-Jun-2023	28 days	6 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid)										
MW-36 DEEP	E562	16-Jun-2023	22-Jun-2023	----	----		22-Jun-2023	28 days	6 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid)										
MW-36A	E562	16-Jun-2023	22-Jun-2023	----	----		22-Jun-2023	28 days	6 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid)										
MW-8A	E562	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	28 days	6 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid)										
MW-8B	E562	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	28 days	6 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid)										
DUP A	E562	15-Jun-2023	22-Jun-2023	----	----		22-Jun-2023	28 days	8 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid)										
DUP B	E562	15-Jun-2023	22-Jun-2023	----	----		22-Jun-2023	28 days	8 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis: Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid)										
DUP C	E562	15-Jun-2023	22-Jun-2023	----	----		22-Jun-2023	28 days	8 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid)										
DUP D	E562	15-Jun-2023	22-Jun-2023	----	----		22-Jun-2023	28 days	8 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid)										
FIELD BLANK	E562	15-Jun-2023	22-Jun-2023	----	----		22-Jun-2023	28 days	8 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid)										
TRIP BLANK	E562	15-Jun-2023	22-Jun-2023	----	----		22-Jun-2023	28 days	8 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
MW-10	E298	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	28 days	6 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
MW-11	E298	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	28 days	6 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
MW-18A	E298	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	28 days	6 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
MW-18B	E298	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	28 days	6 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
MW-19A	E298	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	28 days	6 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) MW-19B	E298	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	28 days	6 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) MW-1B	E298	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	28 days	6 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) MW-1C	E298	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	28 days	6 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) MW-20A	E298	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	28 days	6 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) MW-20B	E298	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	28 days	6 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) MW-21A	E298	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	28 days	6 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) MW-21B	E298	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	28 days	6 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) MW-22A	E298	16-Jun-2023	22-Jun-2023	----	----		22-Jun-2023	28 days	6 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) MW-22B	E298	16-Jun-2023	22-Jun-2023	----	----		22-Jun-2023	28 days	6 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) MW-23A	E298	16-Jun-2023	22-Jun-2023	----	----		22-Jun-2023	28 days	6 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) MW-23B	E298	16-Jun-2023	22-Jun-2023	----	----		22-Jun-2023	28 days	6 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) MW-25A	E298	16-Jun-2023	22-Jun-2023	----	----		22-Jun-2023	28 days	6 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) MW-25B	E298	16-Jun-2023	22-Jun-2023	----	----		22-Jun-2023	28 days	6 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) MW-26A	E298	16-Jun-2023	22-Jun-2023	----	----		22-Jun-2023	28 days	6 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) MW-26B	E298	16-Jun-2023	22-Jun-2023	----	----		22-Jun-2023	28 days	6 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) MW-27A	E298	16-Jun-2023	22-Jun-2023	----	----		22-Jun-2023	28 days	6 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) MW-27B	E298	16-Jun-2023	22-Jun-2023	----	----		22-Jun-2023	28 days	6 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) MW-28A	E298	16-Jun-2023	22-Jun-2023	----	----		22-Jun-2023	28 days	6 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) MW-28B	E298	16-Jun-2023	22-Jun-2023	----	----		22-Jun-2023	28 days	6 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) MW-29A	E298	16-Jun-2023	22-Jun-2023	----	----		22-Jun-2023	28 days	6 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) MW-29B	E298	16-Jun-2023	22-Jun-2023	----	----		22-Jun-2023	28 days	6 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) MW-31A	E298	16-Jun-2023	22-Jun-2023	----	----		22-Jun-2023	28 days	6 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) MW-31B	E298	16-Jun-2023	22-Jun-2023	----	----		22-Jun-2023	28 days	6 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) MW-32A	E298	16-Jun-2023	22-Jun-2023	----	----		22-Jun-2023	28 days	6 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) MW-32B	E298	16-Jun-2023	22-Jun-2023	----	----		22-Jun-2023	28 days	6 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) MW-35A	E298	16-Jun-2023	22-Jun-2023	----	----		22-Jun-2023	28 days	6 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) MW-35B	E298	16-Jun-2023	22-Jun-2023	----	----		22-Jun-2023	28 days	6 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis: Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) MW-35-DEEP	E298	16-Jun-2023	22-Jun-2023	----	----		22-Jun-2023	28 days	6 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) MW-36 DEEP	E298	16-Jun-2023	22-Jun-2023	----	----		22-Jun-2023	28 days	6 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) MW-36A	E298	16-Jun-2023	22-Jun-2023	----	----		22-Jun-2023	28 days	6 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) MW-8A	E298	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	28 days	6 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) MW-8B	E298	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	28 days	6 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) FIELD BLANK	E298	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	28 days	7 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) MW-30A	E298	15-Jun-2023	22-Jun-2023	----	----		22-Jun-2023	28 days	7 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) MW-30B	E298	15-Jun-2023	22-Jun-2023	----	----		22-Jun-2023	28 days	7 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) MW-33A	E298	15-Jun-2023	22-Jun-2023	----	----		22-Jun-2023	28 days	7 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) MW-33B	E298	15-Jun-2023	22-Jun-2023	----	----		22-Jun-2023	28 days	7 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) DUP A	E298	15-Jun-2023	22-Jun-2023	----	----		22-Jun-2023	28 days	8 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) DUP B	E298	15-Jun-2023	22-Jun-2023	----	----		22-Jun-2023	28 days	8 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) DUP C	E298	15-Jun-2023	22-Jun-2023	----	----		22-Jun-2023	28 days	8 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) DUP D	E298	15-Jun-2023	22-Jun-2023	----	----		22-Jun-2023	28 days	8 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) TRIP BLANK	E298	15-Jun-2023	22-Jun-2023	----	----		22-Jun-2023	28 days	8 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE MW-22A	E235.Cl	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	3 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE MW-22B	E235.Cl	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	3 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE MW-23B	E235.Cl	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	3 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis: Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Chloride in Water by IC										
HDPE MW-25B	E235.Cl	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	3 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE MW-26A	E235.Cl	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	3 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE MW-26B	E235.Cl	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	3 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE MW-27A	E235.Cl	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	3 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE MW-27B	E235.Cl	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	3 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE MW-28A	E235.Cl	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	3 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE MW-28B	E235.Cl	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	3 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE MW-29A	E235.Cl	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	3 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE MW-29B	E235.Cl	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	3 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis: Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Chloride in Water by IC										
HDPE MW-31A	E235.Cl	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	3 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE MW-31B	E235.Cl	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	3 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE MW-32A	E235.Cl	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	3 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE MW-32B	E235.Cl	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	3 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE MW-35A	E235.Cl	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	3 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE MW-35B	E235.Cl	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	3 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE MW-35-DEEP	E235.Cl	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	3 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE MW-36 DEEP	E235.Cl	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	3 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE MW-36A	E235.Cl	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	3 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Chloride in Water by IC										
HDPE MW-10	E235.Cl	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	4 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE MW-11	E235.Cl	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	4 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE MW-18A	E235.Cl	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	4 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE MW-18B	E235.Cl	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	4 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE MW-19A	E235.Cl	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	4 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE MW-19B	E235.Cl	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	4 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE MW-1B	E235.Cl	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	4 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE MW-1C	E235.Cl	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	4 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE MW-20A	E235.Cl	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	4 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis: Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Chloride in Water by IC										
HDPE MW-20B	E235.Cl	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	4 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE MW-21A	E235.Cl	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	4 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE MW-21B	E235.Cl	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	4 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE MW-30A	E235.Cl	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	4 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE MW-30B	E235.Cl	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	4 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE MW-33A	E235.Cl	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	4 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE MW-33B	E235.Cl	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	4 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE MW-8A	E235.Cl	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	4 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE MW-8B	E235.Cl	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	4 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis: Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Chloride in Water by IC										
HDPE										
DUP A	E235.Cl	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	5 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE										
DUP B	E235.Cl	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	5 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE										
DUP C	E235.Cl	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	5 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE										
DUP D	E235.Cl	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	5 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE										
FIELD BLANK	E235.Cl	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	5 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE										
TRIP BLANK	E235.Cl	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	5 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE										
MW-23A	E235.Cl	16-Jun-2023	19-Jun-2023	----	----		22-Jun-2023	28 days	6 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE										
MW-25A	E235.Cl	16-Jun-2023	19-Jun-2023	----	----		22-Jun-2023	28 days	6 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE										
MW-22A	E235.F	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	3 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times: Rec	Holding Times: Actual	Eval	Analysis: Analysis Date	Holding Times: Rec	Holding Times: Actual	Eval
Anions and Nutrients : Fluoride in Water by IC										
HDPE MW-22B	E235.F	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	3 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE MW-23B	E235.F	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	3 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE MW-25B	E235.F	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	3 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE MW-26A	E235.F	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	3 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE MW-26B	E235.F	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	3 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE MW-27A	E235.F	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	3 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE MW-27B	E235.F	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	3 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE MW-28A	E235.F	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	3 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE MW-28B	E235.F	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	3 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times: Rec	Holding Times: Actual	Eval	Analysis: Analysis Date	Holding Times: Rec	Holding Times: Actual	Eval
Anions and Nutrients : Fluoride in Water by IC										
HDPE MW-29A	E235.F	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	3 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE MW-29B	E235.F	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	3 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE MW-31A	E235.F	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	3 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE MW-31B	E235.F	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	3 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE MW-32A	E235.F	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	3 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE MW-32B	E235.F	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	3 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE MW-35A	E235.F	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	3 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE MW-35B	E235.F	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	3 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE MW-35-DEEP	E235.F	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	3 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Fluoride in Water by IC										
HDPE MW-36 DEEP	E235.F	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	3 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE MW-36A	E235.F	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	3 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE MW-10	E235.F	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	4 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE MW-11	E235.F	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	4 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE MW-18A	E235.F	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	4 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE MW-18B	E235.F	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	4 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE MW-19A	E235.F	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	4 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE MW-19B	E235.F	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	4 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE MW-1B	E235.F	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	4 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Fluoride in Water by IC										
HDPE MW-1C	E235.F	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	4 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE MW-20A	E235.F	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	4 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE MW-20B	E235.F	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	4 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE MW-21A	E235.F	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	4 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE MW-21B	E235.F	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	4 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE MW-30A	E235.F	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	4 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE MW-30B	E235.F	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	4 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE MW-33A	E235.F	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	4 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE MW-33B	E235.F	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	4 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times: Rec	Holding Times: Actual	Eval	Analysis: Analysis Date	Holding Times: Rec	Holding Times: Actual	Eval
Anions and Nutrients : Fluoride in Water by IC										
HDPE										
MW-8A	E235.F	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	4 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE										
MW-8B	E235.F	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	4 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE										
DUP A	E235.F	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	5 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE										
DUP B	E235.F	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	5 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE										
DUP C	E235.F	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	5 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE										
DUP D	E235.F	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	5 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE										
FIELD BLANK	E235.F	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	5 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE										
TRIP BLANK	E235.F	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	5 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE										
MW-23A	E235.F	16-Jun-2023	19-Jun-2023	----	----		22-Jun-2023	28 days	6 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Fluoride in Water by IC										
HDPE										
MW-25A	E235.F	16-Jun-2023	19-Jun-2023	----	----		22-Jun-2023	28 days	6 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE										
MW-22A	E235.NO3	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	3 days	3 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE										
MW-22B	E235.NO3	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	3 days	3 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE										
MW-23B	E235.NO3	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	3 days	3 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE										
MW-25B	E235.NO3	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	3 days	3 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE										
MW-26A	E235.NO3	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	3 days	3 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE										
MW-26B	E235.NO3	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	3 days	3 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE										
MW-27A	E235.NO3	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	3 days	3 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE										
MW-27B	E235.NO3	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	3 days	3 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis: Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Nitrate in Water by IC										
HDPE MW-28A	E235.NO3	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	3 days	3 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE MW-28B	E235.NO3	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	3 days	3 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE MW-29A	E235.NO3	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	3 days	3 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE MW-29B	E235.NO3	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	3 days	3 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE MW-31A	E235.NO3	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	3 days	3 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE MW-31B	E235.NO3	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	3 days	3 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE MW-32A	E235.NO3	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	3 days	3 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE MW-32B	E235.NO3	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	3 days	3 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE MW-35A	E235.NO3	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	3 days	3 days	✓

Matrix: **Water**

Evaluation: ✗ = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Nitrate in Water by IC										
HDPE MW-35B	E235.NO3	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	3 days	3 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE MW-35-DEEP	E235.NO3	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	3 days	3 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE MW-36 DEEP	E235.NO3	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	3 days	3 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE MW-36A	E235.NO3	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	3 days	3 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE MW-10	E235.NO3	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	3 days	4 days	✗ EHT
Anions and Nutrients : Nitrate in Water by IC										
HDPE MW-11	E235.NO3	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	3 days	4 days	✗ EHT
Anions and Nutrients : Nitrate in Water by IC										
HDPE MW-18A	E235.NO3	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	3 days	4 days	✗ EHT
Anions and Nutrients : Nitrate in Water by IC										
HDPE MW-18B	E235.NO3	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	3 days	4 days	✗ EHT
Anions and Nutrients : Nitrate in Water by IC										
HDPE MW-19A	E235.NO3	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	3 days	4 days	✗ EHT

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis: Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Nitrate in Water by IC										
HDPE MW-19B	E235.NO3	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	3 days	4 days	× EHT
Anions and Nutrients : Nitrate in Water by IC										
HDPE MW-1B	E235.NO3	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	3 days	4 days	× EHT
Anions and Nutrients : Nitrate in Water by IC										
HDPE MW-1C	E235.NO3	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	3 days	4 days	× EHT
Anions and Nutrients : Nitrate in Water by IC										
HDPE MW-20A	E235.NO3	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	3 days	4 days	× EHT
Anions and Nutrients : Nitrate in Water by IC										
HDPE MW-20B	E235.NO3	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	3 days	4 days	× EHT
Anions and Nutrients : Nitrate in Water by IC										
HDPE MW-21A	E235.NO3	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	3 days	4 days	× EHT
Anions and Nutrients : Nitrate in Water by IC										
HDPE MW-21B	E235.NO3	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	3 days	4 days	× EHT
Anions and Nutrients : Nitrate in Water by IC										
HDPE MW-30A	E235.NO3	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	3 days	4 days	× EHT
Anions and Nutrients : Nitrate in Water by IC										
HDPE MW-30B	E235.NO3	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	3 days	4 days	× EHT

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times: Rec	Holding Times: Actual	Eval	Analysis: Analysis Date	Holding Times: Rec	Holding Times: Actual	Eval
Anions and Nutrients : Nitrate in Water by IC										
HDPE MW-33A	E235.NO3	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	3 days	4 days	× EHT
Anions and Nutrients : Nitrate in Water by IC										
HDPE MW-33B	E235.NO3	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	3 days	4 days	× EHT
Anions and Nutrients : Nitrate in Water by IC										
HDPE MW-8A	E235.NO3	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	3 days	4 days	× EHT
Anions and Nutrients : Nitrate in Water by IC										
HDPE MW-8B	E235.NO3	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	3 days	4 days	× EHT
Anions and Nutrients : Nitrate in Water by IC										
HDPE DUP A	E235.NO3	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	3 days	5 days	× EHT
Anions and Nutrients : Nitrate in Water by IC										
HDPE DUP B	E235.NO3	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	3 days	5 days	× EHT
Anions and Nutrients : Nitrate in Water by IC										
HDPE DUP C	E235.NO3	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	3 days	5 days	× EHT
Anions and Nutrients : Nitrate in Water by IC										
HDPE DUP D	E235.NO3	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	3 days	5 days	× EHT
Anions and Nutrients : Nitrate in Water by IC										
HDPE FIELD BLANK	E235.NO3	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	3 days	5 days	× EHT

Matrix: **Water**

Evaluation: ✗ = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis: Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Nitrate in Water by IC										
HDPE										
TRIP BLANK	E235.NO3	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	3 days	5 days	✗ EHT
Anions and Nutrients : Nitrate in Water by IC										
HDPE										
MW-23A	E235.NO3	16-Jun-2023	19-Jun-2023	----	----		22-Jun-2023	3 days	6 days	✗
Anions and Nutrients : Nitrate in Water by IC										
HDPE										
MW-25A	E235.NO3	16-Jun-2023	19-Jun-2023	----	----		22-Jun-2023	3 days	6 days	✗
Anions and Nutrients : Nitrite in Water by IC										
HDPE										
MW-22A	E235.NO2	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	3 days	3 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE										
MW-22B	E235.NO2	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	3 days	3 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE										
MW-23B	E235.NO2	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	3 days	3 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE										
MW-25B	E235.NO2	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	3 days	3 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE										
MW-26A	E235.NO2	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	3 days	3 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE										
MW-26B	E235.NO2	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	3 days	3 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Nitrite in Water by IC										
HDPE MW-27A	E235.NO2	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	3 days	3 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE MW-27B	E235.NO2	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	3 days	3 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE MW-28A	E235.NO2	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	3 days	3 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE MW-28B	E235.NO2	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	3 days	3 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE MW-29A	E235.NO2	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	3 days	3 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE MW-29B	E235.NO2	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	3 days	3 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE MW-31A	E235.NO2	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	3 days	3 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE MW-31B	E235.NO2	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	3 days	3 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE MW-32A	E235.NO2	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	3 days	3 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis: Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Nitrite in Water by IC										
HDPE MW-32B	E235.NO2	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	3 days	3 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE MW-35A	E235.NO2	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	3 days	3 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE MW-35B	E235.NO2	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	3 days	3 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE MW-35-DEEP	E235.NO2	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	3 days	3 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE MW-36 DEEP	E235.NO2	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	3 days	3 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE MW-36A	E235.NO2	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	3 days	3 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE MW-10	E235.NO2	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	3 days	4 days	× EHT
Anions and Nutrients : Nitrite in Water by IC										
HDPE MW-11	E235.NO2	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	3 days	4 days	× EHT
Anions and Nutrients : Nitrite in Water by IC										
HDPE MW-18A	E235.NO2	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	3 days	4 days	× EHT

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis: Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Nitrite in Water by IC										
HDPE MW-18B	E235.NO2	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	3 days	4 days	× EHT
Anions and Nutrients : Nitrite in Water by IC										
HDPE MW-19A	E235.NO2	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	3 days	4 days	× EHT
Anions and Nutrients : Nitrite in Water by IC										
HDPE MW-19B	E235.NO2	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	3 days	4 days	× EHT
Anions and Nutrients : Nitrite in Water by IC										
HDPE MW-1B	E235.NO2	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	3 days	4 days	× EHT
Anions and Nutrients : Nitrite in Water by IC										
HDPE MW-1C	E235.NO2	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	3 days	4 days	× EHT
Anions and Nutrients : Nitrite in Water by IC										
HDPE MW-20A	E235.NO2	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	3 days	4 days	× EHT
Anions and Nutrients : Nitrite in Water by IC										
HDPE MW-20B	E235.NO2	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	3 days	4 days	× EHT
Anions and Nutrients : Nitrite in Water by IC										
HDPE MW-21A	E235.NO2	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	3 days	4 days	× EHT
Anions and Nutrients : Nitrite in Water by IC										
HDPE MW-21B	E235.NO2	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	3 days	4 days	× EHT

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis: Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Nitrite in Water by IC										
HDPE MW-30A	E235.NO2	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	3 days	4 days	× EHT
Anions and Nutrients : Nitrite in Water by IC										
HDPE MW-30B	E235.NO2	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	3 days	4 days	× EHT
Anions and Nutrients : Nitrite in Water by IC										
HDPE MW-33A	E235.NO2	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	3 days	4 days	× EHT
Anions and Nutrients : Nitrite in Water by IC										
HDPE MW-33B	E235.NO2	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	3 days	4 days	× EHT
Anions and Nutrients : Nitrite in Water by IC										
HDPE MW-8A	E235.NO2	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	3 days	4 days	× EHT
Anions and Nutrients : Nitrite in Water by IC										
HDPE MW-8B	E235.NO2	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	3 days	4 days	× EHT
Anions and Nutrients : Nitrite in Water by IC										
HDPE DUP A	E235.NO2	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	3 days	5 days	× EHT
Anions and Nutrients : Nitrite in Water by IC										
HDPE DUP B	E235.NO2	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	3 days	5 days	× EHT
Anions and Nutrients : Nitrite in Water by IC										
HDPE DUP C	E235.NO2	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	3 days	5 days	× EHT

Matrix: **Water**

Evaluation: ✗ = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times: Rec	Holding Times: Actual	Eval	Analysis: Analysis Date	Holding Times: Rec	Holding Times: Actual	Eval
Anions and Nutrients : Nitrite in Water by IC										
HDPE										
DUP D	E235.NO2	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	3 days	5 days	✗ EHT
Anions and Nutrients : Nitrite in Water by IC										
HDPE										
FIELD BLANK	E235.NO2	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	3 days	5 days	✗ EHT
Anions and Nutrients : Nitrite in Water by IC										
HDPE										
TRIP BLANK	E235.NO2	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	3 days	5 days	✗ EHT
Anions and Nutrients : Nitrite in Water by IC										
HDPE										
MW-23A	E235.NO2	16-Jun-2023	19-Jun-2023	----	----		22-Jun-2023	3 days	6 days	✗
Anions and Nutrients : Nitrite in Water by IC										
HDPE										
MW-25A	E235.NO2	16-Jun-2023	19-Jun-2023	----	----		22-Jun-2023	3 days	6 days	✗
Anions and Nutrients : Sulfate in Water by IC										
HDPE										
MW-22A	E235.SO4	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	3 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE										
MW-22B	E235.SO4	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	3 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE										
MW-23B	E235.SO4	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	3 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE										
MW-25B	E235.SO4	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	3 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis: Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Sulfate in Water by IC										
HDPE										
MW-26A	E235.SO4	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	3 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE										
MW-26B	E235.SO4	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	3 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE										
MW-27A	E235.SO4	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	3 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE										
MW-27B	E235.SO4	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	3 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE										
MW-28A	E235.SO4	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	3 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE										
MW-28B	E235.SO4	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	3 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE										
MW-29A	E235.SO4	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	3 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE										
MW-29B	E235.SO4	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	3 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE										
MW-31A	E235.SO4	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	3 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Sulfate in Water by IC										
HDPE MW-31B	E235.SO4	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	3 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE MW-32A	E235.SO4	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	3 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE MW-32B	E235.SO4	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	3 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE MW-35A	E235.SO4	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	3 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE MW-35B	E235.SO4	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	3 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE MW-35-DEEP	E235.SO4	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	3 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE MW-36 DEEP	E235.SO4	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	3 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE MW-36A	E235.SO4	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	3 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE MW-10	E235.SO4	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	4 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Sulfate in Water by IC										
HDPE MW-11	E235.SO4	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	4 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE MW-18A	E235.SO4	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	4 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE MW-18B	E235.SO4	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	4 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE MW-19A	E235.SO4	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	4 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE MW-19B	E235.SO4	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	4 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE MW-1B	E235.SO4	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	4 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE MW-1C	E235.SO4	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	4 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE MW-20A	E235.SO4	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	4 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE MW-20B	E235.SO4	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	4 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Sulfate in Water by IC										
HDPE MW-21A	E235.SO4	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	4 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE MW-21B	E235.SO4	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	4 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE MW-30A	E235.SO4	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	4 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE MW-30B	E235.SO4	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	4 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE MW-33A	E235.SO4	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	4 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE MW-33B	E235.SO4	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	4 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE MW-8A	E235.SO4	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	4 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE MW-8B	E235.SO4	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	4 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE DUP A	E235.SO4	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	5 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times: Rec	Holding Times: Actual	Eval	Analysis: Analysis Date	Holding Times: Rec	Holding Times: Actual	Eval
Anions and Nutrients : Sulfate in Water by IC										
HDPE										
DUP B	E235.SO4	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	5 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE										
DUP C	E235.SO4	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	5 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE										
DUP D	E235.SO4	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	5 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE										
FIELD BLANK	E235.SO4	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	5 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE										
TRIP BLANK	E235.SO4	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	5 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE										
MW-23A	E235.SO4	16-Jun-2023	19-Jun-2023	----	----		22-Jun-2023	28 days	6 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE										
MW-25A	E235.SO4	16-Jun-2023	19-Jun-2023	----	----		22-Jun-2023	28 days	6 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid)										
MW-22A	E318	16-Jun-2023	22-Jun-2023	----	----		22-Jun-2023	28 days	6 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid)										
MW-22B	E318	16-Jun-2023	22-Jun-2023	----	----		22-Jun-2023	28 days	6 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis: Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) MW-23A	E318	16-Jun-2023	22-Jun-2023	----	----		22-Jun-2023	28 days	6 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) MW-23B	E318	16-Jun-2023	22-Jun-2023	----	----		22-Jun-2023	28 days	6 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) MW-25A	E318	16-Jun-2023	22-Jun-2023	----	----		22-Jun-2023	28 days	6 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) MW-25B	E318	16-Jun-2023	22-Jun-2023	----	----		22-Jun-2023	28 days	6 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) MW-26A	E318	16-Jun-2023	22-Jun-2023	----	----		22-Jun-2023	28 days	6 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) MW-26B	E318	16-Jun-2023	22-Jun-2023	----	----		22-Jun-2023	28 days	6 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) MW-27A	E318	16-Jun-2023	22-Jun-2023	----	----		22-Jun-2023	28 days	6 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) MW-27B	E318	16-Jun-2023	22-Jun-2023	----	----		22-Jun-2023	28 days	6 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) MW-28A	E318	16-Jun-2023	22-Jun-2023	----	----		22-Jun-2023	28 days	6 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis: Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) MW-28B	E318	16-Jun-2023	22-Jun-2023	----	----		22-Jun-2023	28 days	6 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) MW-29A	E318	16-Jun-2023	22-Jun-2023	----	----		22-Jun-2023	28 days	6 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) MW-29B	E318	16-Jun-2023	22-Jun-2023	----	----		22-Jun-2023	28 days	6 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) MW-31A	E318	16-Jun-2023	22-Jun-2023	----	----		22-Jun-2023	28 days	6 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) MW-31B	E318	16-Jun-2023	22-Jun-2023	----	----		22-Jun-2023	28 days	6 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) MW-32A	E318	16-Jun-2023	22-Jun-2023	----	----		22-Jun-2023	28 days	6 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) MW-32B	E318	16-Jun-2023	22-Jun-2023	----	----		22-Jun-2023	28 days	6 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) MW-35A	E318	16-Jun-2023	22-Jun-2023	----	----		22-Jun-2023	28 days	6 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) MW-35B	E318	16-Jun-2023	22-Jun-2023	----	----		22-Jun-2023	28 days	6 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis: Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) MW-35-DEEP	E318	16-Jun-2023	22-Jun-2023	----	----		22-Jun-2023	28 days	6 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) MW-36 DEEP	E318	16-Jun-2023	22-Jun-2023	----	----		22-Jun-2023	28 days	6 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) MW-36A	E318	16-Jun-2023	22-Jun-2023	----	----		22-Jun-2023	28 days	6 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) DUP A	E318	15-Jun-2023	22-Jun-2023	----	----		22-Jun-2023	28 days	7 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) DUP B	E318	15-Jun-2023	22-Jun-2023	----	----		22-Jun-2023	28 days	7 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) DUP C	E318	15-Jun-2023	22-Jun-2023	----	----		22-Jun-2023	28 days	7 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) DUP D	E318	15-Jun-2023	22-Jun-2023	----	----		22-Jun-2023	28 days	7 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) FIELD BLANK	E318	15-Jun-2023	22-Jun-2023	----	----		22-Jun-2023	28 days	7 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) MW-10	E318	15-Jun-2023	22-Jun-2023	----	----		22-Jun-2023	28 days	7 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis: Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) MW-11	E318	15-Jun-2023	22-Jun-2023	----	----		22-Jun-2023	28 days	7 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) MW-18A	E318	15-Jun-2023	22-Jun-2023	----	----		22-Jun-2023	28 days	7 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) MW-18B	E318	15-Jun-2023	22-Jun-2023	----	----		22-Jun-2023	28 days	7 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) MW-19A	E318	15-Jun-2023	22-Jun-2023	----	----		22-Jun-2023	28 days	7 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) MW-19B	E318	15-Jun-2023	22-Jun-2023	----	----		22-Jun-2023	28 days	7 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) MW-1B	E318	15-Jun-2023	22-Jun-2023	----	----		22-Jun-2023	28 days	7 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) MW-1C	E318	15-Jun-2023	22-Jun-2023	----	----		22-Jun-2023	28 days	7 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) MW-20A	E318	15-Jun-2023	22-Jun-2023	----	----		22-Jun-2023	28 days	7 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) MW-20B	E318	15-Jun-2023	22-Jun-2023	----	----		22-Jun-2023	28 days	7 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis: Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) MW-21A	E318	15-Jun-2023	22-Jun-2023	----	----		22-Jun-2023	28 days	7 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) MW-21B	E318	15-Jun-2023	22-Jun-2023	----	----		22-Jun-2023	28 days	7 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) MW-30A	E318	15-Jun-2023	22-Jun-2023	----	----		22-Jun-2023	28 days	7 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) MW-30B	E318	15-Jun-2023	22-Jun-2023	----	----		22-Jun-2023	28 days	7 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) MW-33A	E318	15-Jun-2023	22-Jun-2023	----	----		22-Jun-2023	28 days	7 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) MW-33B	E318	15-Jun-2023	22-Jun-2023	----	----		22-Jun-2023	28 days	7 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) MW-8A	E318	15-Jun-2023	22-Jun-2023	----	----		22-Jun-2023	28 days	7 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) MW-8B	E318	15-Jun-2023	22-Jun-2023	----	----		22-Jun-2023	28 days	7 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) TRIP BLANK	E318	15-Jun-2023	22-Jun-2023	----	----		22-Jun-2023	28 days	7 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis: Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
MW-22A	E509	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	3 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
MW-22B	E509	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	3 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
MW-23A	E509	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	3 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
MW-23B	E509	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	3 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
MW-25A	E509	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	3 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
MW-25B	E509	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	3 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
MW-26A	E509	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	3 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
MW-26B	E509	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	3 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
MW-27A	E509	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	3 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
MW-27B	E509	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	3 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
MW-28A	E509	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	3 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
MW-28B	E509	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	3 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
MW-29A	E509	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	3 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
MW-29B	E509	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	3 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
MW-31A	E509	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	3 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
MW-31B	E509	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	3 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
MW-32A	E509	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	3 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
MW-32B	E509	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	3 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
MW-35A	E509	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	3 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
MW-35B	E509	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	3 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
MW-35-DEEP	E509	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	3 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
MW-36 DEEP	E509	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	3 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
MW-36A	E509	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	3 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
MW-10	E509	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	4 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
MW-11	E509	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	4 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
MW-18A	E509	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	4 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
MW-18B	E509	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	4 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
MW-19A	E509	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	4 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
MW-19B	E509	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	4 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
MW-1B	E509	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	4 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
MW-1C	E509	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	4 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
MW-20A	E509	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	4 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
MW-20B	E509	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	4 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
MW-21A	E509	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	4 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
MW-21B	E509	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	4 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
MW-30A	E509	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	4 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis: Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
MW-30B	E509	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	4 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
MW-33A	E509	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	4 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
MW-33B	E509	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	4 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
MW-8A	E509	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	4 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
MW-8B	E509	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	4 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
DUP A	E509	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	5 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
DUP B	E509	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	5 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
DUP C	E509	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	5 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
DUP D	E509	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	5 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times: Rec	Holding Times: Actual	Eval	Analysis: Analysis Date	Holding Times: Rec	Holding Times: Actual	Eval
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
FIELD BLANK	E509	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	5 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
TRIP BLANK	E509	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	28 days	5 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
MW-22A	E421	16-Jun-2023	20-Jun-2023	----	----		21-Jun-2023	180 days	5 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
MW-22B	E421	16-Jun-2023	20-Jun-2023	----	----		21-Jun-2023	180 days	5 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
MW-23A	E421	16-Jun-2023	20-Jun-2023	----	----		21-Jun-2023	180 days	5 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
MW-23B	E421	16-Jun-2023	20-Jun-2023	----	----		21-Jun-2023	180 days	5 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
MW-25A	E421	16-Jun-2023	20-Jun-2023	----	----		21-Jun-2023	180 days	5 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
MW-25B	E421	16-Jun-2023	20-Jun-2023	----	----		21-Jun-2023	180 days	5 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
MW-26A	E421	16-Jun-2023	20-Jun-2023	----	----		21-Jun-2023	180 days	5 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) MW-26B	E421	16-Jun-2023	20-Jun-2023	----	----		21-Jun-2023	180 days	5 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) MW-27A	E421	16-Jun-2023	20-Jun-2023	----	----		21-Jun-2023	180 days	5 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) MW-27B	E421	16-Jun-2023	20-Jun-2023	----	----		21-Jun-2023	180 days	5 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) MW-28A	E421	16-Jun-2023	20-Jun-2023	----	----		21-Jun-2023	180 days	5 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) MW-28B	E421	16-Jun-2023	20-Jun-2023	----	----		21-Jun-2023	180 days	5 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) MW-29A	E421	16-Jun-2023	20-Jun-2023	----	----		21-Jun-2023	180 days	5 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) MW-29B	E421	16-Jun-2023	20-Jun-2023	----	----		21-Jun-2023	180 days	5 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) MW-31A	E421	16-Jun-2023	20-Jun-2023	----	----		21-Jun-2023	180 days	5 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) MW-31B	E421	16-Jun-2023	20-Jun-2023	----	----		21-Jun-2023	180 days	5 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) MW-32A	E421	16-Jun-2023	20-Jun-2023	----	----		21-Jun-2023	180 days	5 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) MW-32B	E421	16-Jun-2023	20-Jun-2023	----	----		21-Jun-2023	180 days	5 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) MW-35A	E421	16-Jun-2023	20-Jun-2023	----	----		21-Jun-2023	180 days	5 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) MW-35B	E421	16-Jun-2023	20-Jun-2023	----	----		21-Jun-2023	180 days	5 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) MW-35-DEEP	E421	16-Jun-2023	20-Jun-2023	----	----		21-Jun-2023	180 days	5 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) MW-36 DEEP	E421	16-Jun-2023	20-Jun-2023	----	----		21-Jun-2023	180 days	5 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) MW-36A	E421	16-Jun-2023	20-Jun-2023	----	----		21-Jun-2023	180 days	5 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) MW-10	E421	15-Jun-2023	20-Jun-2023	----	----		21-Jun-2023	180 days	6 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) MW-11	E421	15-Jun-2023	20-Jun-2023	----	----		21-Jun-2023	180 days	6 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) MW-18A	E421	15-Jun-2023	20-Jun-2023	----	----		21-Jun-2023	180 days	6 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) MW-18B	E421	15-Jun-2023	20-Jun-2023	----	----		21-Jun-2023	180 days	6 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) MW-19A	E421	15-Jun-2023	20-Jun-2023	----	----		21-Jun-2023	180 days	6 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) MW-19B	E421	15-Jun-2023	20-Jun-2023	----	----		21-Jun-2023	180 days	6 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) MW-1B	E421	15-Jun-2023	20-Jun-2023	----	----		21-Jun-2023	180 days	6 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) MW-1C	E421	15-Jun-2023	20-Jun-2023	----	----		21-Jun-2023	180 days	6 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) MW-20A	E421	15-Jun-2023	20-Jun-2023	----	----		21-Jun-2023	180 days	6 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) MW-20B	E421	15-Jun-2023	20-Jun-2023	----	----		21-Jun-2023	180 days	6 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) MW-21A	E421	15-Jun-2023	20-Jun-2023	----	----		21-Jun-2023	180 days	6 days	✓

Matrix: **Water**

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Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) MW-21B	E421	15-Jun-2023	20-Jun-2023	----	----		21-Jun-2023	180 days	6 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) MW-30A	E421	15-Jun-2023	20-Jun-2023	----	----		21-Jun-2023	180 days	6 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) MW-30B	E421	15-Jun-2023	20-Jun-2023	----	----		21-Jun-2023	180 days	6 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) MW-33A	E421	15-Jun-2023	20-Jun-2023	----	----		21-Jun-2023	180 days	6 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) MW-33B	E421	15-Jun-2023	20-Jun-2023	----	----		21-Jun-2023	180 days	6 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) MW-8A	E421	15-Jun-2023	20-Jun-2023	----	----		21-Jun-2023	180 days	6 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) MW-8B	E421	15-Jun-2023	20-Jun-2023	----	----		21-Jun-2023	180 days	6 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) DUP A	E421	15-Jun-2023	20-Jun-2023	----	----		21-Jun-2023	180 days	7 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) DUP B	E421	15-Jun-2023	20-Jun-2023	----	----		21-Jun-2023	180 days	7 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
DUP C	E421	15-Jun-2023	20-Jun-2023	----	----		21-Jun-2023	180 days	7 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
DUP D	E421	15-Jun-2023	20-Jun-2023	----	----		21-Jun-2023	180 days	7 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
FIELD BLANK	E421	15-Jun-2023	20-Jun-2023	----	----		21-Jun-2023	180 days	7 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
TRIP BLANK	E421	15-Jun-2023	20-Jun-2023	----	----		21-Jun-2023	180 days	7 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate)										
MW-22A	E581.F1	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	14 days	3 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate)										
MW-10	E581.F1	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	14 days	4 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate)										
MW-11	E581.F1	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	14 days	4 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate)										
MW-18A	E581.F1	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	14 days	4 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate)										
MW-18B	E581.F1	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	14 days	4 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) MW-19A	E581.F1	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	14 days	4 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) MW-19B	E581.F1	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	14 days	4 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) MW-1B	E581.F1	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	14 days	4 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) MW-1C	E581.F1	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	14 days	4 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) MW-20A	E581.F1	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	14 days	4 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) MW-20B	E581.F1	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	14 days	4 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) MW-21A	E581.F1	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	14 days	4 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) MW-21B	E581.F1	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	14 days	4 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) MW-8A	E581.F1	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	14 days	4 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) MW-8B	E581.F1	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	14 days	4 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) MW-22B	E581.F1	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	5 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) MW-23A	E581.F1	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	5 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) MW-23B	E581.F1	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	5 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) MW-25A	E581.F1	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	5 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) MW-25B	E581.F1	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	5 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) MW-26A	E581.F1	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	5 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) MW-26B	E581.F1	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	5 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) MW-27A	E581.F1	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	5 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) MW-27B	E581.F1	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	5 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) MW-28A	E581.F1	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	5 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) MW-28B	E581.F1	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	5 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) MW-29A	E581.F1	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	5 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) MW-29B	E581.F1	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	5 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) MW-31A	E581.F1	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	5 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) MW-31B	E581.F1	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	5 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) MW-32A	E581.F1	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	5 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) MW-32B	E581.F1	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	5 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis: Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) MW-35A	E581.F1	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	5 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) MW-35B	E581.F1	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	5 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) MW-35-DEEP	E581.F1	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	5 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) MW-36 DEEP	E581.F1	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	5 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) MW-36A	E581.F1	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	5 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) MW-30A	E581.F1	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	6 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) MW-30B	E581.F1	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	6 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) MW-33A	E581.F1	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	6 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) MW-33B	E581.F1	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	6 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times: Rec	Holding Times: Actual	Eval	Analysis: Analysis Date	Holding Times: Rec	Holding Times: Actual	Eval
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) DUP A	E581.F1	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	7 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) DUP B	E581.F1	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	7 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) DUP C	E581.F1	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	7 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) DUP D	E581.F1	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	7 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) FIELD BLANK	E581.F1	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	7 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) TRIP BLANK	E581.F1	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	7 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) MW-22A	E601	16-Jun-2023	20-Jun-2023	14 days	4 days	✓	20-Jun-2023	40 days	0 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) MW-22B	E601	16-Jun-2023	20-Jun-2023	14 days	4 days	✓	20-Jun-2023	40 days	0 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) MW-23A	E601	16-Jun-2023	20-Jun-2023	14 days	4 days	✓	20-Jun-2023	40 days	0 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate)										
MW-23B	E601	16-Jun-2023	20-Jun-2023	14 days	4 days	✓	20-Jun-2023	40 days	0 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate)										
MW-25A	E601	16-Jun-2023	20-Jun-2023	14 days	4 days	✓	20-Jun-2023	40 days	0 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate)										
MW-25B	E601	16-Jun-2023	20-Jun-2023	14 days	4 days	✓	20-Jun-2023	40 days	0 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate)										
MW-26A	E601	16-Jun-2023	20-Jun-2023	14 days	4 days	✓	20-Jun-2023	40 days	0 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate)										
MW-26B	E601	16-Jun-2023	20-Jun-2023	14 days	4 days	✓	20-Jun-2023	40 days	0 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate)										
MW-27A	E601	16-Jun-2023	20-Jun-2023	14 days	4 days	✓	20-Jun-2023	40 days	0 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate)										
MW-27B	E601	16-Jun-2023	20-Jun-2023	14 days	4 days	✓	20-Jun-2023	40 days	0 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate)										
MW-28A	E601	16-Jun-2023	20-Jun-2023	14 days	4 days	✓	20-Jun-2023	40 days	0 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate)										
MW-28B	E601	16-Jun-2023	20-Jun-2023	14 days	4 days	✓	20-Jun-2023	40 days	0 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate)										
MW-29A	E601	16-Jun-2023	20-Jun-2023	14 days	4 days	✓	20-Jun-2023	40 days	0 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate)										
MW-29B	E601	16-Jun-2023	20-Jun-2023	14 days	4 days	✓	20-Jun-2023	40 days	0 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate)										
MW-31A	E601	16-Jun-2023	20-Jun-2023	14 days	4 days	✓	20-Jun-2023	40 days	0 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate)										
MW-31B	E601	16-Jun-2023	20-Jun-2023	14 days	4 days	✓	20-Jun-2023	40 days	0 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate)										
MW-32A	E601	16-Jun-2023	20-Jun-2023	14 days	4 days	✓	20-Jun-2023	40 days	0 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate)										
MW-32B	E601	16-Jun-2023	20-Jun-2023	14 days	4 days	✓	20-Jun-2023	40 days	0 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate)										
MW-35A	E601	16-Jun-2023	20-Jun-2023	14 days	4 days	✓	20-Jun-2023	40 days	0 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate)										
MW-35B	E601	16-Jun-2023	20-Jun-2023	14 days	4 days	✓	20-Jun-2023	40 days	0 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate)										
MW-35-DEEP	E601	16-Jun-2023	20-Jun-2023	14 days	4 days	✓	20-Jun-2023	40 days	0 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate)										
MW-36 DEEP	E601	16-Jun-2023	20-Jun-2023	14 days	4 days	✓	20-Jun-2023	40 days	0 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate)										
MW-36A	E601	16-Jun-2023	20-Jun-2023	14 days	4 days	✓	20-Jun-2023	40 days	0 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate)										
MW-10	E601	15-Jun-2023	20-Jun-2023	14 days	5 days	✓	20-Jun-2023	40 days	0 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate)										
MW-11	E601	15-Jun-2023	20-Jun-2023	14 days	5 days	✓	20-Jun-2023	40 days	0 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate)										
MW-18A	E601	15-Jun-2023	20-Jun-2023	14 days	5 days	✓	20-Jun-2023	40 days	0 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate)										
MW-18B	E601	15-Jun-2023	20-Jun-2023	14 days	5 days	✓	20-Jun-2023	40 days	0 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate)										
MW-19A	E601	15-Jun-2023	20-Jun-2023	14 days	5 days	✓	20-Jun-2023	40 days	0 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate)										
MW-19B	E601	15-Jun-2023	20-Jun-2023	14 days	5 days	✓	20-Jun-2023	40 days	0 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate)										
MW-1B	E601	15-Jun-2023	20-Jun-2023	14 days	5 days	✓	20-Jun-2023	40 days	0 days	✓

Matrix: **Water**

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Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate)										
MW-1C	E601	15-Jun-2023	20-Jun-2023	14 days	5 days	✓	20-Jun-2023	40 days	0 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate)										
MW-20A	E601	15-Jun-2023	20-Jun-2023	14 days	5 days	✓	20-Jun-2023	40 days	0 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate)										
MW-20B	E601	15-Jun-2023	20-Jun-2023	14 days	5 days	✓	20-Jun-2023	40 days	0 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate)										
MW-21A	E601	15-Jun-2023	20-Jun-2023	14 days	5 days	✓	20-Jun-2023	40 days	0 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate)										
MW-21B	E601	15-Jun-2023	20-Jun-2023	14 days	5 days	✓	20-Jun-2023	40 days	0 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate)										
MW-30A	E601	15-Jun-2023	20-Jun-2023	14 days	5 days	✓	20-Jun-2023	40 days	0 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate)										
MW-30B	E601	15-Jun-2023	20-Jun-2023	14 days	5 days	✓	20-Jun-2023	40 days	0 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate)										
MW-33A	E601	15-Jun-2023	20-Jun-2023	14 days	5 days	✓	20-Jun-2023	40 days	0 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate)										
MW-33B	E601	15-Jun-2023	20-Jun-2023	14 days	5 days	✓	20-Jun-2023	40 days	0 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate)										
MW-8A	E601	15-Jun-2023	20-Jun-2023	14 days	5 days	✓	20-Jun-2023	40 days	0 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate)										
MW-8B	E601	15-Jun-2023	20-Jun-2023	14 days	5 days	✓	20-Jun-2023	40 days	0 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate)										
DUP A	E601	15-Jun-2023	20-Jun-2023	14 days	6 days	✓	20-Jun-2023	40 days	0 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate)										
DUP B	E601	15-Jun-2023	20-Jun-2023	14 days	6 days	✓	20-Jun-2023	40 days	0 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate)										
DUP C	E601	15-Jun-2023	20-Jun-2023	14 days	6 days	✓	20-Jun-2023	40 days	0 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate)										
DUP D	E601	15-Jun-2023	20-Jun-2023	14 days	6 days	✓	20-Jun-2023	40 days	0 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate)										
FIELD BLANK	E601	15-Jun-2023	20-Jun-2023	14 days	6 days	✓	20-Jun-2023	40 days	0 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate)										
TRIP BLANK	E601	15-Jun-2023	20-Jun-2023	14 days	6 days	✓	20-Jun-2023	40 days	0 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid)										
MW-22A	E358-L	16-Jun-2023	19-Jun-2023	----	----		21-Jun-2023	28 days	5 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis: Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) MW-22B	E358-L	16-Jun-2023	19-Jun-2023	----	----		21-Jun-2023	28 days	5 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) MW-23A	E358-L	16-Jun-2023	19-Jun-2023	----	----		21-Jun-2023	28 days	5 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) MW-23B	E358-L	16-Jun-2023	19-Jun-2023	----	----		21-Jun-2023	28 days	5 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) MW-25A	E358-L	16-Jun-2023	19-Jun-2023	----	----		21-Jun-2023	28 days	5 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) MW-25B	E358-L	16-Jun-2023	19-Jun-2023	----	----		21-Jun-2023	28 days	5 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) MW-26A	E358-L	16-Jun-2023	19-Jun-2023	----	----		21-Jun-2023	28 days	5 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) MW-26B	E358-L	16-Jun-2023	19-Jun-2023	----	----		21-Jun-2023	28 days	5 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) MW-27A	E358-L	16-Jun-2023	19-Jun-2023	----	----		21-Jun-2023	28 days	5 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) MW-27B	E358-L	16-Jun-2023	19-Jun-2023	----	----		21-Jun-2023	28 days	5 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) MW-28A	E358-L	16-Jun-2023	19-Jun-2023	----	----		21-Jun-2023	28 days	5 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) MW-28B	E358-L	16-Jun-2023	19-Jun-2023	----	----		21-Jun-2023	28 days	5 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) MW-29A	E358-L	16-Jun-2023	19-Jun-2023	----	----		21-Jun-2023	28 days	5 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) MW-29B	E358-L	16-Jun-2023	19-Jun-2023	----	----		21-Jun-2023	28 days	5 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) MW-31A	E358-L	16-Jun-2023	19-Jun-2023	----	----		21-Jun-2023	28 days	5 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) MW-31B	E358-L	16-Jun-2023	19-Jun-2023	----	----		21-Jun-2023	28 days	5 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) MW-32A	E358-L	16-Jun-2023	19-Jun-2023	----	----		21-Jun-2023	28 days	5 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) MW-32B	E358-L	16-Jun-2023	19-Jun-2023	----	----		21-Jun-2023	28 days	5 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) MW-35B	E358-L	16-Jun-2023	19-Jun-2023	----	----		21-Jun-2023	28 days	5 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) MW-35-DEEP	E358-L	16-Jun-2023	19-Jun-2023	----	----		21-Jun-2023	28 days	5 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) MW-36 DEEP	E358-L	16-Jun-2023	19-Jun-2023	----	----		21-Jun-2023	28 days	5 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) MW-36A	E358-L	16-Jun-2023	19-Jun-2023	----	----		21-Jun-2023	28 days	5 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) MW-10	E358-L	15-Jun-2023	19-Jun-2023	----	----		21-Jun-2023	28 days	6 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) MW-11	E358-L	15-Jun-2023	19-Jun-2023	----	----		21-Jun-2023	28 days	6 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) MW-18A	E358-L	15-Jun-2023	19-Jun-2023	----	----		21-Jun-2023	28 days	6 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) MW-18B	E358-L	15-Jun-2023	19-Jun-2023	----	----		21-Jun-2023	28 days	6 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) MW-19A	E358-L	15-Jun-2023	19-Jun-2023	----	----		21-Jun-2023	28 days	6 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) MW-19B	E358-L	15-Jun-2023	19-Jun-2023	----	----		21-Jun-2023	28 days	6 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis: Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) MW-1B	E358-L	15-Jun-2023	19-Jun-2023	----	----		21-Jun-2023	28 days	6 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) MW-1C	E358-L	15-Jun-2023	19-Jun-2023	----	----		21-Jun-2023	28 days	6 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) MW-20A	E358-L	15-Jun-2023	19-Jun-2023	----	----		21-Jun-2023	28 days	6 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) MW-20B	E358-L	15-Jun-2023	19-Jun-2023	----	----		21-Jun-2023	28 days	6 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) MW-21A	E358-L	15-Jun-2023	19-Jun-2023	----	----		21-Jun-2023	28 days	6 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) MW-21B	E358-L	15-Jun-2023	19-Jun-2023	----	----		21-Jun-2023	28 days	6 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) MW-30A	E358-L	15-Jun-2023	19-Jun-2023	----	----		21-Jun-2023	28 days	6 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) MW-30B	E358-L	15-Jun-2023	19-Jun-2023	----	----		21-Jun-2023	28 days	6 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) MW-33A	E358-L	15-Jun-2023	19-Jun-2023	----	----		21-Jun-2023	28 days	6 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis: Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid)										
MW-33B	E358-L	15-Jun-2023	19-Jun-2023	----	----		21-Jun-2023	28 days	6 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid)										
MW-8A	E358-L	15-Jun-2023	19-Jun-2023	----	----		21-Jun-2023	28 days	6 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid)										
MW-8B	E358-L	15-Jun-2023	19-Jun-2023	----	----		21-Jun-2023	28 days	6 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid)										
DUP A	E358-L	15-Jun-2023	19-Jun-2023	----	----		21-Jun-2023	28 days	7 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid)										
DUP B	E358-L	15-Jun-2023	19-Jun-2023	----	----		21-Jun-2023	28 days	7 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid)										
DUP C	E358-L	15-Jun-2023	19-Jun-2023	----	----		21-Jun-2023	28 days	7 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid)										
DUP D	E358-L	15-Jun-2023	19-Jun-2023	----	----		21-Jun-2023	28 days	7 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid)										
FIELD BLANK	E358-L	15-Jun-2023	19-Jun-2023	----	----		21-Jun-2023	28 days	7 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid)										
TRIP BLANK	E358-L	15-Jun-2023	19-Jun-2023	----	----		21-Jun-2023	28 days	7 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
HDPE MW-35A	E358-L	16-Jun-2023	19-Jun-2023	3 days	3 days	✓	21-Jun-2023	28 days	2 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE MW-22A	E290	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	5 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE MW-22B	E290	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	5 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE MW-23A	E290	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	5 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE MW-23B	E290	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	5 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE MW-25A	E290	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	5 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE MW-25B	E290	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	5 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE MW-26A	E290	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	5 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE MW-26B	E290	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	5 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : Alkalinity Species by Titration										
HDPE MW-27A	E290	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	5 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE MW-27B	E290	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	5 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE MW-28A	E290	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	5 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE MW-28B	E290	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	5 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE MW-29A	E290	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	5 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE MW-29B	E290	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	5 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE MW-31A	E290	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	5 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE MW-31B	E290	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	5 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE MW-32A	E290	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	5 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : Alkalinity Species by Titration										
HDPE MW-32B	E290	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	5 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE MW-35A	E290	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	5 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE MW-35B	E290	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	5 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE MW-35-DEEP	E290	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	5 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE MW-36 DEEP	E290	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	5 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE MW-36A	E290	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	5 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE DUP A	E290	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	6 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE DUP B	E290	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	6 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE DUP C	E290	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	6 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : Alkalinity Species by Titration										
HDPE										
DUP D	E290	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	6 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE										
FIELD BLANK	E290	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	6 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE										
MW-10	E290	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	6 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE										
MW-11	E290	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	6 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE										
MW-18A	E290	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	6 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE										
MW-18B	E290	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	6 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE										
MW-19A	E290	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	6 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE										
MW-19B	E290	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	6 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE										
MW-1B	E290	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	6 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : Alkalinity Species by Titration										
HDPE MW-1C	E290	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	6 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE MW-20A	E290	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	6 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE MW-20B	E290	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	6 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE MW-21A	E290	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	6 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE MW-21B	E290	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	6 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE MW-30A	E290	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	6 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE MW-30B	E290	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	6 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE MW-33A	E290	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	6 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE MW-33B	E290	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	6 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : Alkalinity Species by Titration										
HDPE MW-8A	E290	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	6 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE MW-8B	E290	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	6 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE TRIP BLANK	E290	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	6 days	✓
Physical Tests : Conductivity in Water										
HDPE MW-22A	E100	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	28 days	5 days	✓
Physical Tests : Conductivity in Water										
HDPE MW-22B	E100	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	28 days	5 days	✓
Physical Tests : Conductivity in Water										
HDPE MW-23A	E100	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	28 days	5 days	✓
Physical Tests : Conductivity in Water										
HDPE MW-23B	E100	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	28 days	5 days	✓
Physical Tests : Conductivity in Water										
HDPE MW-25A	E100	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	28 days	5 days	✓
Physical Tests : Conductivity in Water										
HDPE MW-25B	E100	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	28 days	5 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : Conductivity in Water										
HDPE MW-26A	E100	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	28 days	5 days	✓
Physical Tests : Conductivity in Water										
HDPE MW-26B	E100	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	28 days	5 days	✓
Physical Tests : Conductivity in Water										
HDPE MW-27A	E100	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	28 days	5 days	✓
Physical Tests : Conductivity in Water										
HDPE MW-27B	E100	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	28 days	5 days	✓
Physical Tests : Conductivity in Water										
HDPE MW-28A	E100	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	28 days	5 days	✓
Physical Tests : Conductivity in Water										
HDPE MW-28B	E100	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	28 days	5 days	✓
Physical Tests : Conductivity in Water										
HDPE MW-29A	E100	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	28 days	5 days	✓
Physical Tests : Conductivity in Water										
HDPE MW-29B	E100	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	28 days	5 days	✓
Physical Tests : Conductivity in Water										
HDPE MW-31A	E100	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	28 days	5 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times: Rec	Holding Times: Actual	Eval	Analysis: Analysis Date	Holding Times: Rec	Holding Times: Actual	Eval
Physical Tests : Conductivity in Water										
HDPE										
MW-31B	E100	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	28 days	5 days	✓
Physical Tests : Conductivity in Water										
HDPE										
MW-32A	E100	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	28 days	5 days	✓
Physical Tests : Conductivity in Water										
HDPE										
MW-32B	E100	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	28 days	5 days	✓
Physical Tests : Conductivity in Water										
HDPE										
MW-35A	E100	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	28 days	5 days	✓
Physical Tests : Conductivity in Water										
HDPE										
MW-35B	E100	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	28 days	5 days	✓
Physical Tests : Conductivity in Water										
HDPE										
MW-35-DEEP	E100	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	28 days	5 days	✓
Physical Tests : Conductivity in Water										
HDPE										
MW-36 DEEP	E100	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	28 days	5 days	✓
Physical Tests : Conductivity in Water										
HDPE										
MW-36A	E100	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	28 days	5 days	✓
Physical Tests : Conductivity in Water										
HDPE										
DUP A	E100	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	28 days	6 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : Conductivity in Water										
HDPE DUP B	E100	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	28 days	6 days	✓
Physical Tests : Conductivity in Water										
HDPE DUP C	E100	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	28 days	6 days	✓
Physical Tests : Conductivity in Water										
HDPE DUP D	E100	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	28 days	6 days	✓
Physical Tests : Conductivity in Water										
HDPE FIELD BLANK	E100	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	28 days	6 days	✓
Physical Tests : Conductivity in Water										
HDPE MW-10	E100	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	28 days	6 days	✓
Physical Tests : Conductivity in Water										
HDPE MW-11	E100	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	28 days	6 days	✓
Physical Tests : Conductivity in Water										
HDPE MW-18A	E100	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	28 days	6 days	✓
Physical Tests : Conductivity in Water										
HDPE MW-18B	E100	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	28 days	6 days	✓
Physical Tests : Conductivity in Water										
HDPE MW-19A	E100	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	28 days	6 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : Conductivity in Water										
HDPE MW-19B	E100	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	28 days	6 days	✓
Physical Tests : Conductivity in Water										
HDPE MW-1B	E100	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	28 days	6 days	✓
Physical Tests : Conductivity in Water										
HDPE MW-1C	E100	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	28 days	6 days	✓
Physical Tests : Conductivity in Water										
HDPE MW-20A	E100	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	28 days	6 days	✓
Physical Tests : Conductivity in Water										
HDPE MW-20B	E100	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	28 days	6 days	✓
Physical Tests : Conductivity in Water										
HDPE MW-21A	E100	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	28 days	6 days	✓
Physical Tests : Conductivity in Water										
HDPE MW-21B	E100	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	28 days	6 days	✓
Physical Tests : Conductivity in Water										
HDPE MW-30A	E100	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	28 days	6 days	✓
Physical Tests : Conductivity in Water										
HDPE MW-30B	E100	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	28 days	6 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : Conductivity in Water										
HDPE MW-33A	E100	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	28 days	6 days	✓
Physical Tests : Conductivity in Water										
HDPE MW-33B	E100	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	28 days	6 days	✓
Physical Tests : Conductivity in Water										
HDPE MW-8A	E100	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	28 days	6 days	✓
Physical Tests : Conductivity in Water										
HDPE MW-8B	E100	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	28 days	6 days	✓
Physical Tests : Conductivity in Water										
HDPE TRIP BLANK	E100	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	28 days	6 days	✓
Physical Tests : pH by Meter										
HDPE DUP A	E108	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	0.25 hrs	0.26 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE DUP B	E108	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	0.25 hrs	0.26 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE DUP C	E108	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	0.25 hrs	0.26 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE DUP D	E108	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	0.25 hrs	0.26 hrs	× EHTR-FM

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis: Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : pH by Meter										
HDPE FIELD BLANK	E108	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	0.25 hrs	0.26 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE MW-10	E108	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	0.25 hrs	0.26 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE MW-11	E108	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	0.25 hrs	0.26 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE MW-18A	E108	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	0.25 hrs	0.26 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE MW-18B	E108	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	0.25 hrs	0.26 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE MW-19A	E108	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	0.25 hrs	0.26 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE MW-19B	E108	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	0.25 hrs	0.26 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE MW-1B	E108	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	0.25 hrs	0.26 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE MW-1C	E108	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	0.25 hrs	0.26 hrs	× EHTR-FM

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis: Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : pH by Meter										
HDPE MW-20A	E108	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	0.25 hrs	0.26 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE MW-20B	E108	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	0.25 hrs	0.26 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE MW-21A	E108	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	0.25 hrs	0.26 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE MW-21B	E108	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	0.25 hrs	0.26 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE MW-22A	E108	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	0.25 hrs	0.26 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE MW-22B	E108	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	0.25 hrs	0.26 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE MW-23A	E108	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	0.25 hrs	0.26 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE MW-23B	E108	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	0.25 hrs	0.26 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE MW-25A	E108	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	0.25 hrs	0.26 hrs	× EHTR-FM

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis: Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : pH by Meter										
HDPE MW-25B	E108	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	0.25 hrs	0.26 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE MW-26A	E108	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	0.25 hrs	0.26 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE MW-26B	E108	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	0.25 hrs	0.26 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE MW-27A	E108	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	0.25 hrs	0.26 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE MW-27B	E108	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	0.25 hrs	0.26 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE MW-28A	E108	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	0.25 hrs	0.26 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE MW-28B	E108	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	0.25 hrs	0.26 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE MW-29A	E108	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	0.25 hrs	0.26 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE MW-29B	E108	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	0.25 hrs	0.26 hrs	× EHTR-FM

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis: Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : pH by Meter										
HDPE MW-30A	E108	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	0.25 hrs	0.26 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE MW-30B	E108	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	0.25 hrs	0.26 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE MW-31A	E108	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	0.25 hrs	0.26 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE MW-31B	E108	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	0.25 hrs	0.26 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE MW-32A	E108	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	0.25 hrs	0.26 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE MW-32B	E108	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	0.25 hrs	0.26 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE MW-33A	E108	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	0.25 hrs	0.26 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE MW-33B	E108	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	0.25 hrs	0.26 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE MW-35A	E108	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	0.25 hrs	0.26 hrs	× EHTR-FM

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis: Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : pH by Meter										
HDPE MW-35B	E108	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	0.25 hrs	0.26 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE MW-35-DEEP	E108	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	0.25 hrs	0.26 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE MW-36 DEEP	E108	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	0.25 hrs	0.26 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE MW-36A	E108	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	0.25 hrs	0.26 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE MW-8A	E108	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	0.25 hrs	0.26 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE MW-8B	E108	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	0.25 hrs	0.26 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE TRIP BLANK	E108	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	0.25 hrs	0.26 hrs	× EHTR-FM
Total Metals : Total Mercury in Water by CVAAS										
HDPE DUP A	E508	15-Jun-2023	23-Jun-2023	----	----		23-Jun-2023	0 hrs	0.04 hrs	× EHTR-FM
Total Metals : Total Mercury in Water by CVAAS										
HDPE DUP B	E508	15-Jun-2023	23-Jun-2023	----	----		23-Jun-2023	0 hrs	0.04 hrs	× EHTR-FM

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis: Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Total Metals : Total Mercury in Water by CVAAS										
HDPE DUP C	E508	15-Jun-2023	23-Jun-2023	----	----		23-Jun-2023	0 hrs	0.04 hrs	× EHTR-FM
Total Metals : Total Mercury in Water by CVAAS										
HDPE DUP D	E508	15-Jun-2023	23-Jun-2023	----	----		23-Jun-2023	0 hrs	0.04 hrs	× EHTR-FM
Total Metals : Total Mercury in Water by CVAAS										
HDPE FIELD BLANK	E508	15-Jun-2023	23-Jun-2023	----	----		23-Jun-2023	0 hrs	0.04 hrs	× EHTR-FM
Total Metals : Total Mercury in Water by CVAAS										
HDPE MW-35A	E508	16-Jun-2023	23-Jun-2023	----	----		23-Jun-2023	0 hrs	0.04 hrs	× EHTR-FM
Total Metals : Total Mercury in Water by CVAAS										
HDPE MW-35B	E508	16-Jun-2023	23-Jun-2023	----	----		23-Jun-2023	0 hrs	0.04 hrs	× EHTR-FM
Total Metals : Total Mercury in Water by CVAAS										
HDPE MW-36 DEEP	E508	16-Jun-2023	23-Jun-2023	----	----		23-Jun-2023	0 hrs	0.04 hrs	× EHTR-FM
Total Metals : Total Mercury in Water by CVAAS										
HDPE MW-36A	E508	16-Jun-2023	23-Jun-2023	----	----		23-Jun-2023	0 hrs	0.04 hrs	× EHTR-FM
Total Metals : Total Mercury in Water by CVAAS										
HDPE TRIP BLANK	E508	15-Jun-2023	23-Jun-2023	----	----		23-Jun-2023	0 hrs	0.04 hrs	× EHTR-FM
Total Metals : Total metals in Water by CRC ICPMS										
HDPE DUP A	E420	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	0 hrs	4 hrs	× EHTR-FM

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis: Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Total Metals : Total metals in Water by CRC ICPMS										
HDPE DUP B	E420	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	0 hrs	4 hrs	× EHTR-FM
Total Metals : Total metals in Water by CRC ICPMS										
HDPE DUP C	E420	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	0 hrs	4 hrs	× EHTR-FM
Total Metals : Total metals in Water by CRC ICPMS										
HDPE DUP D	E420	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	0 hrs	4 hrs	× EHTR-FM
Total Metals : Total metals in Water by CRC ICPMS										
HDPE FIELD BLANK	E420	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	0 hrs	4 hrs	× EHTR-FM
Total Metals : Total metals in Water by CRC ICPMS										
HDPE MW-35A	E420	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	0 hrs	4 hrs	× EHTR-FM
Total Metals : Total metals in Water by CRC ICPMS										
HDPE MW-35B	E420	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	0 hrs	4 hrs	× EHTR-FM
Total Metals : Total metals in Water by CRC ICPMS										
HDPE MW-36 DEEP	E420	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	0 hrs	4 hrs	× EHTR-FM
Total Metals : Total metals in Water by CRC ICPMS										
HDPE MW-36A	E420	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	0 hrs	4 hrs	× EHTR-FM
Total Metals : Total metals in Water by CRC ICPMS										
HDPE TRIP BLANK	E420	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	0 hrs	4 hrs	× EHTR-FM

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) MW-22A	E611A	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	14 days	3 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) MW-10	E611A	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	14 days	4 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) MW-11	E611A	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	14 days	4 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) MW-18A	E611A	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	14 days	4 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) MW-18B	E611A	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	14 days	4 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) MW-19A	E611A	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	14 days	4 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) MW-19B	E611A	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	14 days	4 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) MW-1B	E611A	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	14 days	4 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) MW-1C	E611A	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	14 days	4 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) MW-20A	E611A	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	14 days	4 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) MW-20B	E611A	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	14 days	4 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) MW-21A	E611A	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	14 days	4 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) MW-21B	E611A	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	14 days	4 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) MW-8A	E611A	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	14 days	4 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) MW-8B	E611A	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	14 days	4 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) MW-22B	E611A	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	5 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) MW-23A	E611A	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	5 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) MW-23B	E611A	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	5 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) MW-25A	E611A	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	5 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) MW-25B	E611A	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	5 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) MW-26A	E611A	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	5 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) MW-26B	E611A	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	5 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) MW-27A	E611A	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	5 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) MW-27B	E611A	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	5 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) MW-28A	E611A	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	5 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) MW-28B	E611A	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	5 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) MW-29A	E611A	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	5 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) MW-29B	E611A	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	5 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) MW-31A	E611A	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	5 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) MW-31B	E611A	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	5 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) MW-32A	E611A	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	5 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) MW-32B	E611A	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	5 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) MW-35A	E611A	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	5 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) MW-35B	E611A	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	5 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) MW-35-DEEP	E611A	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	5 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) MW-36 DEEP	E611A	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	5 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) MW-36A	E611A	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	5 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) MW-30A	E611A	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	6 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) MW-30B	E611A	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	6 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) MW-33A	E611A	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	6 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) MW-33B	E611A	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	6 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) DUP A	E611A	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	7 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) DUP B	E611A	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	7 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) DUP C	E611A	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	7 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) DUP D	E611A	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	7 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate)										
FIELD BLANK	E611A	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	7 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate)										
TRIP BLANK	E611A	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	7 days	✓
Volatile Organic Compounds : VOCs (Prairies List) by Headspace GC-MS										
Glass vial (sodium bisulfate)										
MW-22A	E611E	16-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	14 days	3 days	✓
Volatile Organic Compounds : VOCs (Prairies List) by Headspace GC-MS										
Glass vial (sodium bisulfate)										
MW-10	E611E	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	14 days	4 days	✓
Volatile Organic Compounds : VOCs (Prairies List) by Headspace GC-MS										
Glass vial (sodium bisulfate)										
MW-11	E611E	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	14 days	4 days	✓
Volatile Organic Compounds : VOCs (Prairies List) by Headspace GC-MS										
Glass vial (sodium bisulfate)										
MW-18A	E611E	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	14 days	4 days	✓
Volatile Organic Compounds : VOCs (Prairies List) by Headspace GC-MS										
Glass vial (sodium bisulfate)										
MW-18B	E611E	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	14 days	4 days	✓
Volatile Organic Compounds : VOCs (Prairies List) by Headspace GC-MS										
Glass vial (sodium bisulfate)										
MW-19A	E611E	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	14 days	4 days	✓
Volatile Organic Compounds : VOCs (Prairies List) by Headspace GC-MS										
Glass vial (sodium bisulfate)										
MW-19B	E611E	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	14 days	4 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Volatile Organic Compounds : VOCs (Prairies List) by Headspace GC-MS										
Glass vial (sodium bisulfate) MW-1B	E611E	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	14 days	4 days	✓
Volatile Organic Compounds : VOCs (Prairies List) by Headspace GC-MS										
Glass vial (sodium bisulfate) MW-1C	E611E	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	14 days	4 days	✓
Volatile Organic Compounds : VOCs (Prairies List) by Headspace GC-MS										
Glass vial (sodium bisulfate) MW-20A	E611E	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	14 days	4 days	✓
Volatile Organic Compounds : VOCs (Prairies List) by Headspace GC-MS										
Glass vial (sodium bisulfate) MW-20B	E611E	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	14 days	4 days	✓
Volatile Organic Compounds : VOCs (Prairies List) by Headspace GC-MS										
Glass vial (sodium bisulfate) MW-21A	E611E	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	14 days	4 days	✓
Volatile Organic Compounds : VOCs (Prairies List) by Headspace GC-MS										
Glass vial (sodium bisulfate) MW-21B	E611E	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	14 days	4 days	✓
Volatile Organic Compounds : VOCs (Prairies List) by Headspace GC-MS										
Glass vial (sodium bisulfate) MW-8A	E611E	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	14 days	4 days	✓
Volatile Organic Compounds : VOCs (Prairies List) by Headspace GC-MS										
Glass vial (sodium bisulfate) MW-8B	E611E	15-Jun-2023	19-Jun-2023	----	----		19-Jun-2023	14 days	4 days	✓
Volatile Organic Compounds : VOCs (Prairies List) by Headspace GC-MS										
Glass vial (sodium bisulfate) MW-22B	E611E	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	5 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Volatile Organic Compounds : VOCs (Prairies List) by Headspace GC-MS										
Glass vial (sodium bisulfate) MW-23A	E611E	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	5 days	✓
Volatile Organic Compounds : VOCs (Prairies List) by Headspace GC-MS										
Glass vial (sodium bisulfate) MW-23B	E611E	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	5 days	✓
Volatile Organic Compounds : VOCs (Prairies List) by Headspace GC-MS										
Glass vial (sodium bisulfate) MW-25A	E611E	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	5 days	✓
Volatile Organic Compounds : VOCs (Prairies List) by Headspace GC-MS										
Glass vial (sodium bisulfate) MW-25B	E611E	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	5 days	✓
Volatile Organic Compounds : VOCs (Prairies List) by Headspace GC-MS										
Glass vial (sodium bisulfate) MW-26A	E611E	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	5 days	✓
Volatile Organic Compounds : VOCs (Prairies List) by Headspace GC-MS										
Glass vial (sodium bisulfate) MW-26B	E611E	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	5 days	✓
Volatile Organic Compounds : VOCs (Prairies List) by Headspace GC-MS										
Glass vial (sodium bisulfate) MW-27A	E611E	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	5 days	✓
Volatile Organic Compounds : VOCs (Prairies List) by Headspace GC-MS										
Glass vial (sodium bisulfate) MW-27B	E611E	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	5 days	✓
Volatile Organic Compounds : VOCs (Prairies List) by Headspace GC-MS										
Glass vial (sodium bisulfate) MW-28A	E611E	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	5 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Volatile Organic Compounds : VOCs (Prairies List) by Headspace GC-MS										
Glass vial (sodium bisulfate) MW-28B	E611E	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	5 days	✓
Volatile Organic Compounds : VOCs (Prairies List) by Headspace GC-MS										
Glass vial (sodium bisulfate) MW-29A	E611E	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	5 days	✓
Volatile Organic Compounds : VOCs (Prairies List) by Headspace GC-MS										
Glass vial (sodium bisulfate) MW-29B	E611E	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	5 days	✓
Volatile Organic Compounds : VOCs (Prairies List) by Headspace GC-MS										
Glass vial (sodium bisulfate) MW-31A	E611E	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	5 days	✓
Volatile Organic Compounds : VOCs (Prairies List) by Headspace GC-MS										
Glass vial (sodium bisulfate) MW-31B	E611E	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	5 days	✓
Volatile Organic Compounds : VOCs (Prairies List) by Headspace GC-MS										
Glass vial (sodium bisulfate) MW-32A	E611E	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	5 days	✓
Volatile Organic Compounds : VOCs (Prairies List) by Headspace GC-MS										
Glass vial (sodium bisulfate) MW-32B	E611E	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	5 days	✓
Volatile Organic Compounds : VOCs (Prairies List) by Headspace GC-MS										
Glass vial (sodium bisulfate) MW-35A	E611E	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	5 days	✓
Volatile Organic Compounds : VOCs (Prairies List) by Headspace GC-MS										
Glass vial (sodium bisulfate) MW-35B	E611E	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	5 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Volatile Organic Compounds : VOCs (Prairies List) by Headspace GC-MS										
Glass vial (sodium bisulfate) MW-35-DEEP	E611E	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	5 days	✓
Volatile Organic Compounds : VOCs (Prairies List) by Headspace GC-MS										
Glass vial (sodium bisulfate) MW-36 DEEP	E611E	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	5 days	✓
Volatile Organic Compounds : VOCs (Prairies List) by Headspace GC-MS										
Glass vial (sodium bisulfate) MW-36A	E611E	16-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	5 days	✓
Volatile Organic Compounds : VOCs (Prairies List) by Headspace GC-MS										
Glass vial (sodium bisulfate) MW-30A	E611E	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	6 days	✓
Volatile Organic Compounds : VOCs (Prairies List) by Headspace GC-MS										
Glass vial (sodium bisulfate) MW-30B	E611E	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	6 days	✓
Volatile Organic Compounds : VOCs (Prairies List) by Headspace GC-MS										
Glass vial (sodium bisulfate) MW-33A	E611E	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	6 days	✓
Volatile Organic Compounds : VOCs (Prairies List) by Headspace GC-MS										
Glass vial (sodium bisulfate) MW-33B	E611E	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	6 days	✓
Volatile Organic Compounds : VOCs (Prairies List) by Headspace GC-MS										
Glass vial (sodium bisulfate) DUP A	E611E	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	7 days	✓
Volatile Organic Compounds : VOCs (Prairies List) by Headspace GC-MS										
Glass vial (sodium bisulfate) DUP B	E611E	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	7 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Volatile Organic Compounds : VOCs (Prairies List) by Headspace GC-MS										
Glass vial (sodium bisulfate)										
DUP C	E611E	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	7 days	✓
Volatile Organic Compounds : VOCs (Prairies List) by Headspace GC-MS										
Glass vial (sodium bisulfate)										
DUP D	E611E	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	7 days	✓
Volatile Organic Compounds : VOCs (Prairies List) by Headspace GC-MS										
Glass vial (sodium bisulfate)										
FIELD BLANK	E611E	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	7 days	✓
Volatile Organic Compounds : VOCs (Prairies List) by Headspace GC-MS										
Glass vial (sodium bisulfate)										
TRIP BLANK	E611E	15-Jun-2023	21-Jun-2023	----	----		21-Jun-2023	14 days	7 days	✓

Legend & Qualifier Definitions

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended

EHT: Exceeded ALS recommended hold time prior to analysis.

Rec. HT: ALS recommended hold time (see units).

Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Water**

Evaluation: ✗ = *QC frequency outside specification*; ✓ = *QC frequency within specification.*

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Duplicates (DUP)							
Alkalinity Species by Titration	E290	1000349	3	57	5.2	5.0	✓
Ammonia by Fluorescence	E298	1001127	4	66	6.0	5.0	✓
BTEX by Headspace GC-MS	E611A	996595	3	57	5.2	5.0	✓
CCME PHC - F1 by Headspace GC-FID	E581.F1	996594	3	57	5.2	5.0	✓
Chloride in Water by IC	E235.Cl	997151	3	47	6.3	5.0	✓
Conductivity in Water	E100	1000348	3	57	5.2	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	996670	3	47	6.3	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	998152	3	47	6.3	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	997116	3	47	6.3	5.0	✓
Fluoride in Water by IC	E235.F	997148	3	48	6.2	5.0	✓
Nitrate in Water by IC	E235.NO3	997149	3	47	6.3	5.0	✓
Nitrite in Water by IC	E235.NO2	997150	3	47	6.3	5.0	✓
pH by Meter	E108	1000347	3	60	5.0	5.0	✓
Phenols (4AAP) in Water by Colorimetry	E562	1000147	3	57	5.2	5.0	✓
Sulfate in Water by IC	E235.SO4	997152	2	47	4.2	5.0	✗
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	1000106	3	47	6.3	5.0	✓
Total Mercury in Water by CVAAS	E508	1004768	1	17	5.8	5.0	✓
Total metals in Water by CRC ICPMS	E420	998151	1	11	9.0	5.0	✓
VOCs (Prairies List) by Headspace GC-MS	E611E	996596	3	54	5.5	5.0	✓
Laboratory Control Samples (LCS)							
Alkalinity Species by Titration	E290	1000349	3	57	5.2	5.0	✓
Ammonia by Fluorescence	E298	1001127	4	66	6.0	5.0	✓
BTEX by Headspace GC-MS	E611A	996595	3	57	5.2	5.0	✓
CCME PHC - F1 by Headspace GC-FID	E581.F1	996594	3	57	5.2	5.0	✓
CCME PHCs - F2-F4 by GC-FID	E601	997762	3	58	5.1	5.0	✓
Chloride in Water by IC	E235.Cl	997151	3	47	6.3	5.0	✓
Conductivity in Water	E100	1000348	3	57	5.2	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	996670	3	47	6.3	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	998152	3	47	6.3	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	997116	3	47	6.3	5.0	✓
Fluoride in Water by IC	E235.F	997148	3	48	6.2	5.0	✓
Nitrate in Water by IC	E235.NO3	997149	3	47	6.3	5.0	✓
Nitrite in Water by IC	E235.NO2	997150	3	47	6.3	5.0	✓
pH by Meter	E108	1000347	3	60	5.0	5.0	✓
Phenols (4AAP) in Water by Colorimetry	E562	1000147	3	57	5.2	5.0	✓
Sulfate in Water by IC	E235.SO4	997152	3	47	6.3	5.0	✓

Matrix: **Water**

Evaluation: × = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Control Samples (LCS) - Continued							
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	1000106	3	47	6.3	5.0	✓
Total Mercury in Water by CVAAS	E508	1004768	1	17	5.8	5.0	✓
Total metals in Water by CRC ICPMS	E420	998151	1	11	9.0	5.0	✓
VOCs (Prairies List) by Headspace GC-MS	E611E	996596	3	54	5.5	5.0	✓
Method Blanks (MB)							
Alkalinity Species by Titration	E290	1000349	3	57	5.2	5.0	✓
Ammonia by Fluorescence	E298	1001127	4	66	6.0	5.0	✓
BTEX by Headspace GC-MS	E611A	996595	3	57	5.2	5.0	✓
CCME PHC - F1 by Headspace GC-FID	E581.F1	996594	3	57	5.2	5.0	✓
CCME PHCs - F2-F4 by GC-FID	E601	997762	3	58	5.1	5.0	✓
Chloride in Water by IC	E235.Cl	997151	3	47	6.3	5.0	✓
Conductivity in Water	E100	1000348	3	57	5.2	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	996670	3	47	6.3	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	998152	3	47	6.3	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	997116	3	47	6.3	5.0	✓
Fluoride in Water by IC	E235.F	997148	3	48	6.2	5.0	✓
Nitrate in Water by IC	E235.NO3	997149	3	47	6.3	5.0	✓
Nitrite in Water by IC	E235.NO2	997150	3	47	6.3	5.0	✓
Phenols (4AAP) in Water by Colorimetry	E562	1000147	3	57	5.2	5.0	✓
Sulfate in Water by IC	E235.SO4	997152	3	47	6.3	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	1000106	3	47	6.3	5.0	✓
Total Mercury in Water by CVAAS	E508	1004768	1	17	5.8	5.0	✓
Total metals in Water by CRC ICPMS	E420	998151	1	11	9.0	5.0	✓
VOCs (Prairies List) by Headspace GC-MS	E611E	996596	3	54	5.5	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	1001127	4	66	6.0	5.0	✓
BTEX by Headspace GC-MS	E611A	996595	3	57	5.2	5.0	✓
Chloride in Water by IC	E235.Cl	997151	3	47	6.3	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	996670	3	47	6.3	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	998152	3	47	6.3	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	997116	3	47	6.3	5.0	✓
Fluoride in Water by IC	E235.F	997148	3	48	6.2	5.0	✓
Nitrate in Water by IC	E235.NO3	997149	3	47	6.3	5.0	✓
Nitrite in Water by IC	E235.NO2	997150	3	47	6.3	5.0	✓
Phenols (4AAP) in Water by Colorimetry	E562	1000147	3	57	5.2	5.0	✓
Sulfate in Water by IC	E235.SO4	997152	3	47	6.3	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	1000106	3	47	6.3	5.0	✓
Total Mercury in Water by CVAAS	E508	1004768	1	17	5.8	5.0	✓
Total metals in Water by CRC ICPMS	E420	998151	1	11	9.0	5.0	✓

Matrix: **Water**

Evaluation: × = *QC frequency outside specification*; ✓ = *QC frequency within specification.*

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Matrix Spikes (MS) - Continued							
VOCs (Prairies List) by Headspace GC-MS	E611E	996596	3	54	5.5	5.0	✓

Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Conductivity in Water	E100 Calgary - Environmental	Water	APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a water sample. Conductivity measurements are temperature-compensated to 25°C.
pH by Meter	E108 Calgary - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
Chloride in Water by IC	E235.Cl Calgary - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Fluoride in Water by IC	E235.F Calgary - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrite in Water by IC	E235.NO2 Calgary - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Water by IC	E235.NO3 Calgary - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Sulfate in Water by IC	E235.SO4 Calgary - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Alkalinity Species by Titration	E290 Calgary - Environmental	Water	APHA 2320 B (mod)	Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.
Ammonia by Fluorescence	E298 Edmonton - Environmental	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318 Edmonton - Environmental	Water	Method Fialab 100, 2018	TKN in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021).
Dissolved Organic Carbon by Combustion (Low Level)	E358-L Calgary - Environmental	Water	APHA 5310 B (mod)	Dissolved Organic Carbon (Non-Purgeable), also known as NPOC (dissolved), is a direct measurement of DOC after a filtered (0.45 micron) sample has been acidified and purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO2. NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of DC (dissolved carbon) is comprised of IC (which is common), this method is more accurate and more reliable than the DOC by subtraction method (i.e. DC minus DIC).

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Total metals in Water by CRC ICPMS	E420 Calgary - Environmental	Water	EPA 200.2/6020B (mod)	Water samples are digested with nitric and hydrochloric acids, and analyzed by Collision/Reaction Cell ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Dissolved Metals in Water by CRC ICPMS	E421 Calgary - Environmental	Water	APHA 3030B/EPA 6020B (mod)	Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by Collision/Reaction Cell ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Total Mercury in Water by CVAAS	E508 Calgary - Environmental	Water	EPA 1631E (mod)	Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS
Dissolved Mercury in Water by CVAAS	E509 Edmonton - Environmental	Water	APHA 3030B/EPA 1631E (mod)	Water samples are filtered (0.45 um), preserved with HCl, then undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.
Phenols (4AAP) in Water by Colorimetry	E562 Edmonton - Environmental	Water	EPA 9066	This automated method is based on the distillation of phenol and subsequent reaction of the distillate with alkaline ferricyanide (K3Fe(CN)6) and 4-amino-antipyrine (4-AAP) to form a red complex which is measured colorimetrically.
CCME PHC - F1 by Headspace GC-FID	E581.F1 Edmonton - Environmental	Water	CCME PHC in Soil - Tier 1	CCME Fraction 1 (F1) is analyzed by static headspace GC-FID. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
CCME PHCs - F2-F4 by GC-FID	E601 Edmonton - Environmental	Water	CCME PHC in Soil - Tier 1	Sample extracts are analyzed by GC-FID for CCME hydrocarbon fractions (F2-F4).
BTEX by Headspace GC-MS	E611A Edmonton - Environmental	Water	EPA 8260D (mod)	Volatile Organic Compounds (VOCs) are analyzed by static headspace GC-MS. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
VOCs (Prairies List) by Headspace GC-MS	E611E Edmonton - Environmental	Water	EPA 8260D (mod)	Volatile Organic Compounds (VOCs) are analyzed by static headspace GC-MS. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
Dissolved Hardness (Calculated)	EC100 Calgary - Environmental	Water	APHA 2340B	"Hardness (as CaCO3), dissolved" is calculated from the sum of dissolved Calcium and Magnesium concentrations, expressed in CaCO3 equivalents. "Total Hardness" refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because it is a property of water due to dissolved divalent cations.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Ion Balance using Dissolved Metals	EC101 Calgary - Environmental	Water	APHA 1030E	Cation Sum, Anion Sum, and Ion Balance are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Dissolved species are used where available. Minor ions are included where data is present. Ion Balance cannot be calculated accurately for waters with very low electrical conductivity (EC).
TDS in Water (Calculation)	EC103 Calgary - Environmental	Water	APHA 1030E (mod)	Total Dissolved Solids is calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Dissolved species are used where available. Minor ions are included where data is present.
Nitrate and Nitrite (as N) (Calculation)	EC235.N+N Calgary - Environmental	Water	EPA 300.0	Nitrate and Nitrite (as N) is a calculated parameter. Nitrate and Nitrite (as N) = Nitrite (as N) + Nitrate (as N).
F1-BTEX	EC580 Edmonton - Environmental	Water	CCME PHC in Soil - Tier 1	F1-BTEX is calculated as follows: F1-BTEX = F1 (C6-C10) minus benzene, toluene, ethylbenzene and xylenes (BTEX).

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 Edmonton - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Digestion for TKN in water	EP318 Edmonton - Environmental	Water	APHA 4500-Norg D (mod)	Samples are digested at high temperature using Sulfuric Acid with Copper catalyst, which converts organic nitrogen sources to Ammonia, which is then quantified by the analytical method as TKN. This method is unsuitable for samples containing high levels of nitrate. If nitrate exceeds TKN concentration by ten times or more, results may be biased low.
Preparation for Dissolved Organic Carbon for Combustion	EP358 Calgary - Environmental	Water	APHA 5310 B (mod)	Preparation for Dissolved Organic Carbon
Dissolved Metals Water Filtration	EP421 Calgary - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HNO3.
Dissolved Mercury Water Filtration	EP509 Edmonton - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HCl.
VOCs Preparation for Headspace Analysis	EP581 Edmonton - Environmental	Water	EPA 5021A (mod)	Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler. An aliquot of the headspace is then injected into the GC/MS-FID system.
PHCs and PAHs Hexane Extraction	EP601 Edmonton - Environmental	Water	EPA 3511 (mod)	Petroleum Hydrocarbons (PHCs) and Polycyclic Aromatic Hydrocarbons (PAHs) are extracted using a hexane liquid-liquid extraction.

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QUALITY CONTROL REPORT

Work Order	: **EO2304968**	Page	: 1 of 55
Client	: Tetra Tech Canada Inc.	Laboratory	: Edmonton - Environmental
Contact	: Carl Forkheim	Account Manager	: Kieran Tordoff
Address	: North Building 14940 123 Ave NW Edmonton AB Canada T5V 1B4	Address	: 9450 - 17 Avenue NW Edmonton, Alberta Canada T6N 1M9
Telephone	:	Telephone	: +1 780 413 5227
Project	: SWM.SWOP04591-03	Date Samples Received	: 16-Jun-2023 16:35
PO	: ----	Date Analysis Commenced	: 19-Jun-2023
C-O-C number	: ----	Issue Date	: 27-Jun-2023 16:52
Sampler	: ---- 403-510-7241		
Site	: ----		
Quote number	: EO23-EBAE100-006 (Q83988)		
No. of samples received	: 48		
No. of samples analysed	: 47		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percent Difference (RPD) and Data Quality Objectives
- Matrix Spike (MS) Report; Recovery and Data Quality Objectives
- Method Blank (MB) Report; Recovery and Data Quality Objectives
- Laboratory Control Sample (LCS) Report; Recovery and Data Quality Objectives

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	*Position*	*Laboratory Department*
Adrian Hilts	Lab Analyst	Edmonton Metals, Edmonton, Alberta
Andrew Fox		Calgary Metals, Calgary, Alberta
Brooke Miller	Laboratory Analyst	Edmonton Inorganics, Edmonton, Alberta
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George Huang	Supervisor - Inorganic	Calgary Inorganics, Calgary, Alberta
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Kevin Baxter	Team Leader - Inorganics	Calgary Inorganics, Calgary, Alberta
Kevin Baxter	Team Leader - Inorganics	Calgary Metals, Calgary, Alberta
Ping Yeung	Team Leader - Inorganics	Edmonton Inorganics, Edmonton, Alberta
Yan Zhang	Lab Analyst	Edmonton Organics, Edmonton, Alberta

General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number = Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO = Data Quality Objective.
LOR = Limit of Reporting (detection limit).
RPD = Relative Percent Difference
# = Indicates a QC result that did not meet the ALS DQO.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test-specific).

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Physical Tests (QC Lot: 1000347)											
EO2304952-001	Anonymous	pH	----	E108	0.10	pH units	8.01	8.03	0.249%	4%	----
Physical Tests (QC Lot: 1000348)											
EO2304960-001	Anonymous	Conductivity	----	E100	2.0	µS/cm	600	599	0.167%	10%	----
Physical Tests (QC Lot: 1000349)											
EO2304960-001	Anonymous	Alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	345	370	6.94%	20%	----
Physical Tests (QC Lot: 1000353)											
EO2304968-017	MW-23A	Alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	1060	1130	6.82%	20%	----
Physical Tests (QC Lot: 1000354)											
EO2304968-017	MW-23A	pH	----	E108	0.10	pH units	9.04	9.02	0.221%	4%	----
Physical Tests (QC Lot: 1000355)											
EO2304968-017	MW-23A	Conductivity	----	E100	1.0	µS/cm	2150	2120	1.40%	10%	----
Physical Tests (QC Lot: 1000356)											
EO2304968-037	MW-35-DEEP	Alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	430	420	2.40%	20%	----
Physical Tests (QC Lot: 1000357)											
EO2304968-037	MW-35-DEEP	pH	----	E108	0.10	pH units	8.73	8.74	0.114%	4%	----
Physical Tests (QC Lot: 1000358)											
EO2304968-037	MW-35-DEEP	Conductivity	----	E100	1.0	µS/cm	5170	5170	0.00%	10%	----
Anions and Nutrients (QC Lot: 1000106)											
EO2304968-001	MW-1B	Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	1.19	1.43	18.5%	20%	----
Anions and Nutrients (QC Lot: 1000107)											
EO2304968-021	MW-26A	Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	0.124	0.129	0.004	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1000108)											
EO2304968-042	MW-36A	Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	1.16	1.05	9.76%	20%	----
Anions and Nutrients (QC Lot: 1001127)											
EO2304968-048	FIELD BLANK	Ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1001471)											
EO2304945-006	Anonymous	Ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1003447)											
EO2304968-033	MW-32A	Ammonia, total (as N)	7664-41-7	E298	0.500	mg/L	3.76	3.46	0.299	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1003460)											

Sub-Matrix: **Water**

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Laboratory Duplicate (DUP) Report						
					LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Anions and Nutrients (QC Lot: 1003460) - continued											
EO2304968-047	TRIP BLANK	Ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 997148)											
EO2304968-001	MW-1B	Fluoride	16984-48-8	E235.F	0.100	mg/L	0.856	0.833	0.023	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 997149)											
EO2304968-001	MW-1B	Nitrate (as N)	14797-55-8	E235.NO3	0.100	mg/L	0.261	0.269	0.008	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 997150)											
EO2304968-001	MW-1B	Nitrite (as N)	14797-65-0	E235.NO2	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 997151)											
EO2304968-001	MW-1B	Chloride	16887-00-6	E235.Cl	2.50	mg/L	5.53	5.51	0.02	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 997153)											
EO2304968-021	MW-26A	Sulfate (as SO4)	14808-79-8	E235.SO4	1.50	mg/L	471	471	0.0622%	20%	----
Anions and Nutrients (QC Lot: 997154)											
EO2304968-021	MW-26A	Nitrate (as N)	14797-55-8	E235.NO3	0.100	mg/L	0.960	0.961	0.0008	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 997155)											
EO2304968-021	MW-26A	Nitrite (as N)	14797-65-0	E235.NO2	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 997156)											
EO2304968-021	MW-26A	Fluoride	16984-48-8	E235.F	0.100	mg/L	0.852	0.839	0.013	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 997157)											
EO2304968-021	MW-26A	Chloride	16887-00-6	E235.Cl	2.50	mg/L	4.95	4.81	0.14	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 997162)											
EO2304959-001	Anonymous	Fluoride	16984-48-8	E235.F	0.020	mg/L	0.681	0.669	1.73%	20%	----
Anions and Nutrients (QC Lot: 997165)											
EO2304968-029	MW-30A	Sulfate (as SO4)	14808-79-8	E235.SO4	1.50	mg/L	375	373	0.516%	20%	----
Anions and Nutrients (QC Lot: 997166)											
EO2304968-029	MW-30A	Nitrate (as N)	14797-55-8	E235.NO3	0.100	mg/L	0.164	0.163	0.0006	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 997167)											
EO2304968-029	MW-30A	Nitrite (as N)	14797-65-0	E235.NO2	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 997168)											
EO2304968-029	MW-30A	Chloride	16887-00-6	E235.Cl	2.50	mg/L	<2.50	<2.50	0	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 997116)											
EO2304968-001	MW-1B	Carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	7.60	7.37	3.00%	20%	----
Organic / Inorganic Carbon (QC Lot: 997117)											
EO2304968-021	MW-26A	Carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	11.8	12.8	7.43%	20%	----

Sub-Matrix: **Water**

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Laboratory Duplicate (DUP) Report						
					LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Organic / Inorganic Carbon (QC Lot: 997118)											
EO2304968-042	MW-36A	Carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	17.1	16.2	5.30%	20%	----
Total Metals (QC Lot: 1004768)											
CG2308076-001	Anonymous	Mercury, total	7439-97-6	E508	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
Total Metals (QC Lot: 998151)											
CG2307986-001	Anonymous	Aluminum, total	7429-90-5	E420	0.0030	mg/L	0.0043	0.0037	0.0006	Diff <2x LOR	----
		Antimony, total	7440-36-0	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Arsenic, total	7440-38-2	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Barium, total	7440-39-3	E420	0.00010	mg/L	0.0116	0.0118	1.64%	20%	----
		Beryllium, total	7440-41-7	E420	0.000020	mg/L	<0.000020	<0.000020	0	Diff <2x LOR	----
		Bismuth, total	7440-69-9	E420	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		Boron, total	7440-42-8	E420	0.010	mg/L	0.638	0.666	4.31%	20%	----
		Cadmium, total	7440-43-9	E420	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
		Calcium, total	7440-70-2	E420	0.050	mg/L	2.20	2.23	1.20%	20%	----
		Cesium, total	7440-46-2	E420	0.000010	mg/L	0.000053	0.000054	0.000002	Diff <2x LOR	----
		Chromium, total	7440-47-3	E420	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		Cobalt, total	7440-48-4	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Copper, total	7440-50-8	E420	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		Iron, total	7439-89-6	E420	0.010	mg/L	0.110	0.110	0.668%	20%	----
		Lead, total	7439-92-1	E420	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		Lithium, total	7439-93-2	E420	0.0010	mg/L	0.0728	0.0719	1.27%	20%	----
		Magnesium, total	7439-95-4	E420	0.0050	mg/L	0.365	0.376	2.97%	20%	----
		Manganese, total	7439-96-5	E420	0.00010	mg/L	0.00560	0.00562	0.317%	20%	----
		Molybdenum, total	7439-98-7	E420	0.000050	mg/L	0.000785	0.000817	3.98%	20%	----
		Nickel, total	7440-02-0	E420	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		Phosphorus, total	7723-14-0	E420	0.050	mg/L	0.320	0.272	0.048	Diff <2x LOR	----
		Potassium, total	7440-09-7	E420	0.050	mg/L	0.853	0.841	1.42%	20%	----
		Rubidium, total	7440-17-7	E420	0.00020	mg/L	0.00198	0.00185	0.00013	Diff <2x LOR	----
		Selenium, total	7782-49-2	E420	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		Silicon, total	7440-21-3	E420	0.10	mg/L	5.35	5.44	1.68%	20%	----
		Silver, total	7440-22-4	E420	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		Sodium, total	7440-23-5	E420	0.050	mg/L	327	331	1.11%	20%	----
		Strontium, total	7440-24-6	E420	0.00020	mg/L	0.0267	0.0260	2.75%	20%	----
		Sulfur, total	7704-34-9	E420	0.50	mg/L	1.98	2.10	0.11	Diff <2x LOR	----
		Tellurium, total	13494-80-9	E420	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Total Metals (QC Lot: 998151) - continued											
CG2307986-001	Anonymous	Thallium, total	7440-28-0	E420	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		Thorium, total	7440-29-1	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Tin, total	7440-31-5	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Titanium, total	7440-32-6	E420	0.00030	mg/L	<0.00030	<0.00030	0	Diff <2x LOR	----
		Tungsten, total	7440-33-7	E420	0.00010	mg/L	0.00163	0.00162	0.663%	20%	----
		Uranium, total	7440-61-1	E420	0.000010	mg/L	0.000015	0.000014	0.0000003	Diff <2x LOR	----
		Vanadium, total	7440-62-2	E420	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		Zinc, total	7440-66-6	E420	0.0030	mg/L	<0.0030	<0.0030	0	Diff <2x LOR	----
		Zirconium, total	7440-67-7	E420	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
Dissolved Metals (QC Lot: 996670)											
EO2304968-001	MW-1B	Mercury, dissolved	7439-97-6	E509	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
Dissolved Metals (QC Lot: 996671)											
EO2304968-021	MW-26A	Mercury, dissolved	7439-97-6	E509	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
Dissolved Metals (QC Lot: 996672)											
EO2304968-042	MW-36A	Mercury, dissolved	7439-97-6	E509	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
Dissolved Metals (QC Lot: 998152)											
EO2304968-001	MW-1B	Aluminum, dissolved	7429-90-5	E421	0.0050	mg/L	0.0096	0.0095	0.0001	Diff <2x LOR	----
		Antimony, dissolved	7440-36-0	E421	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		Arsenic, dissolved	7440-38-2	E421	0.00050	mg/L	0.00144	0.00144	0.000007	Diff <2x LOR	----
		Barium, dissolved	7440-39-3	E421	0.00050	mg/L	0.0505	0.0442	13.2%	20%	----
		Beryllium, dissolved	7440-41-7	E421	0.000100	mg/L	<0.000100	<0.000100	0	Diff <2x LOR	----
		Bismuth, dissolved	7440-69-9	E421	0.000250	mg/L	<0.000250	<0.000250	0	Diff <2x LOR	----
		Boron, dissolved	7440-42-8	E421	0.050	mg/L	0.678	0.752	10.4%	20%	----
		Cadmium, dissolved	7440-43-9	E421	0.0000250	mg/L	0.0000410	0.0000342	0.0000068	Diff <2x LOR	----
		Calcium, dissolved	7440-70-2	E421	0.250	mg/L	6.58	6.75	2.52%	20%	----
		Cesium, dissolved	7440-46-2	E421	0.000050	mg/L	0.000050	<0.000050	0.0000001	Diff <2x LOR	----
		Chromium, dissolved	7440-47-3	E421	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		Cobalt, dissolved	7440-48-4	E421	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		Copper, dissolved	7440-50-8	E421	0.00100	mg/L	0.00170	0.00170	0.000003	Diff <2x LOR	----
		Iron, dissolved	7439-89-6	E421	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
		Lead, dissolved	7439-92-1	E421	0.000250	mg/L	<0.000250	<0.000250	0	Diff <2x LOR	----
		Lithium, dissolved	7439-93-2	E421	0.0050	mg/L	0.126	0.130	3.07%	20%	----
		Magnesium, dissolved	7439-95-4	E421	0.0250	mg/L	0.845	0.878	3.84%	20%	----
		Manganese, dissolved	7439-96-5	E421	0.00050	mg/L	0.0584	0.0602	3.03%	20%	----

Sub-Matrix: **Water**

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Laboratory Duplicate (DUP) Report LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Dissolved Metals (QC Lot: 998152) - continued											
EO2304968-001	MW-1B	Molybdenum, dissolved	7439-98-7	E421	0.000250	mg/L	0.00782	0.00765	2.16%	20%	----
		Nickel, dissolved	7440-02-0	E421	0.00250	mg/L	0.00684	0.00717	0.00033	Diff <2x LOR	----
		Phosphorus, dissolved	7723-14-0	E421	0.250	mg/L	<0.250	<0.250	0	Diff <2x LOR	----
		Potassium, dissolved	7440-09-7	E421	0.250	mg/L	2.01	2.02	0.010	Diff <2x LOR	----
		Rubidium, dissolved	7440-17-7	E421	0.00100	mg/L	0.00375	0.00379	0.00003	Diff <2x LOR	----
		Selenium, dissolved	7782-49-2	E421	0.000250	mg/L	<0.000250	<0.000250	0	Diff <2x LOR	----
		Silicon, dissolved	7440-21-3	E421	0.250	mg/L	3.20	3.22	0.802%	20%	----
		Silver, dissolved	7440-22-4	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		Sodium, dissolved	7440-23-5	E421	0.250	mg/L	532	550	3.23%	20%	----
		Strontium, dissolved	7440-24-6	E421	0.00100	mg/L	0.161	0.159	1.81%	20%	----
		Sulfur, dissolved	7704-34-9	E421	2.50	mg/L	51.8	53.6	3.23%	20%	----
		Tellurium, dissolved	13494-80-9	E421	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		Thallium, dissolved	7440-28-0	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		Thorium, dissolved	7440-29-1	E421	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		Tin, dissolved	7440-31-5	E421	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		Titanium, dissolved	7440-32-6	E421	0.00150	mg/L	<0.00150	<0.00150	0	Diff <2x LOR	----
		Tungsten, dissolved	7440-33-7	E421	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		Uranium, dissolved	7440-61-1	E421	0.000050	mg/L	0.00128	0.00136	6.10%	20%	----
		Vanadium, dissolved	7440-62-2	E421	0.00250	mg/L	<0.00250	<0.00250	0	Diff <2x LOR	----
		Zinc, dissolved	7440-66-6	E421	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
		Zirconium, dissolved	7440-67-7	E421	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
Dissolved Metals (QC Lot: 998153)											
EO2304968-021	MW-26A	Aluminum, dissolved	7429-90-5	E421	0.0050	mg/L	0.0264	0.0221	0.0043	Diff <2x LOR	----
		Antimony, dissolved	7440-36-0	E421	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		Arsenic, dissolved	7440-38-2	E421	0.00050	mg/L	0.00242	0.00239	0.00003	Diff <2x LOR	----
		Barium, dissolved	7440-39-3	E421	0.00050	mg/L	0.0544	0.0539	1.06%	20%	----
		Beryllium, dissolved	7440-41-7	E421	0.000100	mg/L	<0.000100	<0.000100	0	Diff <2x LOR	----
		Bismuth, dissolved	7440-69-9	E421	0.000250	mg/L	<0.000250	<0.000250	0	Diff <2x LOR	----
		Boron, dissolved	7440-42-8	E421	0.050	mg/L	0.822	0.828	0.702%	20%	----
		Cadmium, dissolved	7440-43-9	E421	0.0000250	mg/L	<0.0000250	<0.0000250	0	Diff <2x LOR	----
		Calcium, dissolved	7440-70-2	E421	0.250	mg/L	8.50	8.55	0.635%	20%	----
		Cesium, dissolved	7440-46-2	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		Chromium, dissolved	7440-47-3	E421	0.00050	mg/L	0.00110	0.00099	0.00011	Diff <2x LOR	----
		Cobalt, dissolved	7440-48-4	E421	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----

Sub-Matrix: **Water**

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Laboratory Duplicate (DUP) Report LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Dissolved Metals (QC Lot: 998153) - continued											
EO2304968-021	MW-26A	Copper, dissolved	7440-50-8	E421	0.00100	mg/L	0.00360	0.00345	0.00016	Diff <2x LOR	----
		Iron, dissolved	7439-89-6	E421	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
		Lead, dissolved	7439-92-1	E421	0.000250	mg/L	<0.000250	<0.000250	0	Diff <2x LOR	----
		Lithium, dissolved	7439-93-2	E421	0.0050	mg/L	0.151	0.146	3.00%	20%	----
		Magnesium, dissolved	7439-95-4	E421	0.0250	mg/L	1.15	1.13	1.75%	20%	----
		Manganese, dissolved	7439-96-5	E421	0.00050	mg/L	0.0160	0.0162	0.942%	20%	----
		Molybdenum, dissolved	7439-98-7	E421	0.000250	mg/L	0.00543	0.00560	3.17%	20%	----
		Nickel, dissolved	7440-02-0	E421	0.00250	mg/L	<0.00250	<0.00250	0	Diff <2x LOR	----
		Phosphorus, dissolved	7723-14-0	E421	0.250	mg/L	<0.250	<0.250	0	Diff <2x LOR	----
		Potassium, dissolved	7440-09-7	E421	0.250	mg/L	2.40	2.37	0.027	Diff <2x LOR	----
		Rubidium, dissolved	7440-17-7	E421	0.00100	mg/L	0.00347	0.00385	0.00038	Diff <2x LOR	----
		Selenium, dissolved	7782-49-2	E421	0.000250	mg/L	<0.000250	<0.000250	0	Diff <2x LOR	----
		Silicon, dissolved	7440-21-3	E421	0.250	mg/L	4.29	4.32	0.752%	20%	----
		Silver, dissolved	7440-22-4	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		Sodium, dissolved	7440-23-5	E421	0.250	mg/L	651	643	1.20%	20%	----
		Strontium, dissolved	7440-24-6	E421	0.00100	mg/L	0.207	0.212	2.09%	20%	----
		Sulfur, dissolved	7704-34-9	E421	2.50	mg/L	176	176	0.273%	20%	----
		Tellurium, dissolved	13494-80-9	E421	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		Thallium, dissolved	7440-28-0	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		Thorium, dissolved	7440-29-1	E421	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		Tin, dissolved	7440-31-5	E421	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		Titanium, dissolved	7440-32-6	E421	0.00150	mg/L	<0.00150	<0.00150	0	Diff <2x LOR	----
		Tungsten, dissolved	7440-33-7	E421	0.00050	mg/L	0.00057	0.00055	0.00002	Diff <2x LOR	----
		Uranium, dissolved	7440-61-1	E421	0.000050	mg/L	0.000682	0.000684	0.293%	20%	----
		Vanadium, dissolved	7440-62-2	E421	0.00250	mg/L	0.00273	<0.00250	0.00023	Diff <2x LOR	----
		Zinc, dissolved	7440-66-6	E421	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
		Zirconium, dissolved	7440-67-7	E421	0.00100	mg/L	0.00106	0.00105	0.000009	Diff <2x LOR	----
Dissolved Metals (QC Lot: 998154)											
EO2304968-042	MW-36A	Aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	0.0052	0.0052	0.0000002	Diff <2x LOR	----
		Antimony, dissolved	7440-36-0	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	0.00114	0.00124	8.91%	20%	----
		Barium, dissolved	7440-39-3	E421	0.00010	mg/L	0.0747	0.0739	1.02%	20%	----
		Beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	<0.000020	<0.000020	0	Diff <2x LOR	----
		Bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----

Sub-Matrix: **Water**

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Laboratory Duplicate (DUP) Report LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Dissolved Metals (QC Lot: 998154) - continued											
EO2304968-042	MW-36A	Boron, dissolved	7440-42-8	E421	0.010	mg/L	0.661	0.669	1.13%	20%	----
		Cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
		Calcium, dissolved	7440-70-2	E421	0.050	mg/L	2.96	2.96	0.0749%	20%	----
		Cesium, dissolved	7440-46-2	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		Chromium, dissolved	7440-47-3	E421	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		Cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	0.00027	0.00026	0.000009	Diff <2x LOR	----
		Copper, dissolved	7440-50-8	E421	0.00020	mg/L	0.00030	0.00030	0.000001	Diff <2x LOR	----
		Iron, dissolved	7439-89-6	E421	0.010	mg/L	0.086	0.085	0.001	Diff <2x LOR	----
		Lead, dissolved	7439-92-1	E421	0.000050	mg/L	0.000081	0.000080	0.000001	Diff <2x LOR	----
		Lithium, dissolved	7439-93-2	E421	0.0010	mg/L	0.0783	0.0765	2.29%	20%	----
		Magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	0.396	0.394	0.516%	20%	----
		Manganese, dissolved	7439-96-5	E421	0.00010	mg/L	0.179	0.180	0.406%	20%	----
		Molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	0.0122	0.0122	0.228%	20%	----
		Nickel, dissolved	7440-02-0	E421	0.00050	mg/L	0.00057	0.00053	0.00003	Diff <2x LOR	----
		Phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	0.313	0.324	0.011	Diff <2x LOR	----
		Potassium, dissolved	7440-09-7	E421	0.050	mg/L	1.48	1.48	0.264%	20%	----
		Rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	0.00196	0.00223	12.8%	20%	----
		Selenium, dissolved	7782-49-2	E421	0.000050	mg/L	0.000068	0.000052	0.000015	Diff <2x LOR	----
		Silicon, dissolved	7440-21-3	E421	0.050	mg/L	4.13	4.09	0.844%	20%	----
		Silver, dissolved	7440-22-4	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		Sodium, dissolved	7440-23-5	E421	0.050	mg/L	438	438	0.0116%	20%	----
		Strontium, dissolved	7440-24-6	E421	0.00020	mg/L	0.0647	0.0640	1.19%	20%	----
		Sulfur, dissolved	7704-34-9	E421	0.50	mg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		Thallium, dissolved	7440-28-0	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		Thorium, dissolved	7440-29-1	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Tin, dissolved	7440-31-5	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Titanium, dissolved	7440-32-6	E421	0.00030	mg/L	<0.00030	<0.00030	0	Diff <2x LOR	----
		Tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	0.00055	0.00054	0.000005	Diff <2x LOR	----
		Uranium, dissolved	7440-61-1	E421	0.000010	mg/L	0.000184	0.000189	2.68%	20%	----
		Vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		Zinc, dissolved	7440-66-6	E421	0.0010	mg/L	0.0014	0.0013	0.00008	Diff <2x LOR	----
		Zirconium, dissolved	7440-67-7	E421	0.00020	mg/L	0.00074	0.00071	0.00002	Diff <2x LOR	----
Aggregate Organics (QC Lot: 1000147)											

Sub-Matrix: **Water**

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Laboratory Duplicate (DUP) Report						
					LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Aggregate Organics (QC Lot: 1000147) - continued											
CG2308044-007	Anonymous	Phenols, total (4AAP)	----	E562	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
Aggregate Organics (QC Lot: 1000152)											
EO2304968-017	MW-23A	Phenols, total (4AAP)	----	E562	0.0010	mg/L	0.0056	0.0047	0.0008	Diff <2x LOR	----
Aggregate Organics (QC Lot: 1003714)											
EO2304968-037	MW-35-DEEP	Phenols, total (4AAP)	----	E562	0.0010	mg/L	0.0019	0.0018	0.0002	Diff <2x LOR	----
Volatile Organic Compounds (QC Lot: 1000805)											
EO2304968-036	MW-33B	Benzene	71-43-2	E611E	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Bromobenzene	108-86-1	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Bromochloromethane	74-97-5	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Bromodichloromethane	75-27-4	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Bromoform	75-25-2	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Bromomethane	74-83-9	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Butylbenzene, n-	104-51-8	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Butylbenzene, sec-	135-98-8	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Butylbenzene, tert-	98-06-6	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Carbon tetrachloride	56-23-5	E611E	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Chlorobenzene	108-90-7	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Chloroethane	75-00-3	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Chloroform	67-66-3	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Chloromethane	74-87-3	E611E	5.0	µg/L	<5.0	<5.0	0	Diff <2x LOR	----
		Chlorotoluene, 2-	95-49-8	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Chlorotoluene, 4-	106-43-4	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Cymene, p-	99-87-6	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dibromo-3-chloropropane, 1,2-	96-12-8	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dibromochloromethane	124-48-1	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dibromoethane, 1,2-	106-93-4	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dibromomethane	74-95-3	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dichlorobenzene, 1,2-	95-50-1	E611E	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Dichlorobenzene, 1,3-	541-73-1	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dichlorobenzene, 1,4-	106-46-7	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dichlorodifluoromethane	75-71-8	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dichloroethane, 1,1-	75-34-3	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dichloroethane, 1,2-	107-06-2	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dichloroethylene, 1,1-	75-35-4	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----

Sub-Matrix: **Water**

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Laboratory Duplicate (DUP) Report LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Volatile Organic Compounds (QC Lot: 1000805) - continued											
EO2304968-036	MW-33B	Dichloroethylene, cis-1,2-	156-59-2	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dichloroethylene, trans-1,2-	156-60-5	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dichloromethane	75-09-2	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dichloropropane, 1,2-	78-87-5	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dichloropropane, 1,3-	142-28-9	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dichloropropane, 2,2-	594-20-7	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dichloropropylene, 1,1-	563-58-6	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dichloropropylene, cis-1,3-	10061-01-5	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dichloropropylene, trans-1,3-	10061-02-6	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Ethylbenzene	100-41-4	E611E	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Hexachlorobutadiene	87-68-3	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Isopropylbenzene	98-82-8	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Methyl-tert-butyl ether [MTBE]	1634-04-4	E611E	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Propylbenzene, n-	103-65-1	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Styrene	100-42-5	E611E	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Tetrachloroethane, 1,1,1,2-	630-20-6	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Tetrachloroethane, 1,1,2,2-	79-34-5	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Tetrachloroethylene	127-18-4	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Toluene	108-88-3	E611E	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Trichlorobenzene, 1,2,3-	87-61-6	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Trichlorobenzene, 1,2,4-	120-82-1	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Trichloroethane, 1,1,1-	71-55-6	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Trichloroethane, 1,1,2-	79-00-5	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Trichloroethylene	79-01-6	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Trichlorofluoromethane	75-69-4	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Trichloropropane, 1,2,3-	96-18-4	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Trimethylbenzene, 1,2,4-	95-63-6	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Trimethylbenzene, 1,3,5-	108-67-8	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Vinyl chloride	75-01-4	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Xylene, m+p-	179601-23-1	E611E	0.40	µg/L	<0.40	<0.40	0	Diff <2x LOR	----
		Xylene, o-	95-47-6	E611E	0.30	µg/L	<0.30	<0.30	0	Diff <2x LOR	----
Volatile Organic Compounds (QC Lot: 1000806)											
EO2304968-036	MW-33B	Benzene	71-43-2	E611A	0.50	µg/L	<0.00050 mg/L	<0.50	0	Diff <2x LOR	----

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Volatile Organic Compounds (QC Lot: 1000806) - continued											
EO2304968-036	MW-33B	Ethylbenzene	100-41-4	E611A	0.50	µg/L	<0.00050 mg/L	<0.50	0	Diff <2x LOR	----
		Styrene	100-42-5	E611A	0.50	µg/L	<0.00050 mg/L	<0.50	0	Diff <2x LOR	----
		Toluene	108-88-3	E611A	0.50	µg/L	<0.00050 mg/L	<0.50	0	Diff <2x LOR	----
		Xylene, m+p-	179601-23-1	E611A	0.40	µg/L	<0.00040 mg/L	<0.40	0	Diff <2x LOR	----
		Xylene, o-	95-47-6	E611A	0.30	µg/L	<0.00030 mg/L	<0.30	0	Diff <2x LOR	----
Volatile Organic Compounds (QC Lot: 996595)											
EO2304959-001	Anonymous	Benzene	71-43-2	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Ethylbenzene	100-41-4	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Styrene	100-42-5	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Toluene	108-88-3	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Xylene, m+p-	179601-23-1	E611A	0.40	µg/L	<0.40	<0.40	0	Diff <2x LOR	----
		Xylene, o-	95-47-6	E611A	0.30	µg/L	<0.30	<0.30	0	Diff <2x LOR	----
Volatile Organic Compounds (QC Lot: 996596)											
EO2304968-001	MW-1B	Benzene	71-43-2	E611E	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Bromobenzene	108-86-1	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Bromochloromethane	74-97-5	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Bromodichloromethane	75-27-4	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Bromoform	75-25-2	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Bromomethane	74-83-9	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Butylbenzene, n-	104-51-8	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Butylbenzene, sec-	135-98-8	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Butylbenzene, tert-	98-06-6	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Carbon tetrachloride	56-23-5	E611E	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Chlorobenzene	108-90-7	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Chloroethane	75-00-3	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Chloroform	67-66-3	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Chloromethane	74-87-3	E611E	5.0	µg/L	<5.0	<5.0	0	Diff <2x LOR	----
		Chlorotoluene, 2-	95-49-8	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Chlorotoluene, 4-	106-43-4	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Cymene, p-	99-87-6	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dibromo-3-chloropropane, 1,2-	96-12-8	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dibromochloromethane	124-48-1	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----

Sub-Matrix: **Water**

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Laboratory Duplicate (DUP) Report						
					LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Volatile Organic Compounds (QC Lot: 996596) - continued											
EO2304968-001	MW-1B	Dibromoethane, 1,2-	106-93-4	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dibromomethane	74-95-3	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dichlorobenzene, 1,2-	95-50-1	E611E	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Dichlorobenzene, 1,3-	541-73-1	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dichlorobenzene, 1,4-	106-46-7	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dichlorodifluoromethane	75-71-8	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dichloroethane, 1,1-	75-34-3	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dichloroethane, 1,2-	107-06-2	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dichloroethylene, 1,1-	75-35-4	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dichloroethylene, cis-1,2-	156-59-2	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dichloroethylene, trans-1,2-	156-60-5	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dichloromethane	75-09-2	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dichloropropane, 1,2-	78-87-5	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dichloropropane, 1,3-	142-28-9	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dichloropropane, 2,2-	594-20-7	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dichloropropylene, 1,1-	563-58-6	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dichloropropylene, cis-1,3-	10061-01-5	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dichloropropylene, trans-1,3-	10061-02-6	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Ethylbenzene	100-41-4	E611E	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Hexachlorobutadiene	87-68-3	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Isopropylbenzene	98-82-8	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Methyl-tert-butyl ether [MTBE]	1634-04-4	E611E	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Propylbenzene, n-	103-65-1	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Styrene	100-42-5	E611E	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Tetrachloroethane, 1,1,1,2-	630-20-6	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Tetrachloroethane, 1,1,2,2-	79-34-5	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Tetrachloroethylene	127-18-4	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Toluene	108-88-3	E611E	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Trichlorobenzene, 1,2,3-	87-61-6	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Trichlorobenzene, 1,2,4-	120-82-1	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Trichloroethane, 1,1,1-	71-55-6	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Trichloroethane, 1,1,2-	79-00-5	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Trichloroethylene	79-01-6	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Trichlorofluoromethane	75-69-4	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----

Sub-Matrix: **Water**

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Laboratory Duplicate (DUP) Report						
					LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Volatile Organic Compounds (QC Lot: 996596) - continued											
EO2304968-001	MW-1B	Trichloropropane, 1,2,3-	96-18-4	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Trimethylbenzene, 1,2,4-	95-63-6	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Trimethylbenzene, 1,3,5-	108-67-8	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Vinyl chloride	75-01-4	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Xylene, m+p-	179601-23-1	E611E	0.40	µg/L	<0.40	<0.40	0	Diff <2x LOR	----
		Xylene, o-	95-47-6	E611E	0.30	µg/L	<0.30	<0.30	0	Diff <2x LOR	----
Volatile Organic Compounds (QC Lot: 998108)											
EO2304968-016	MW-22B	Benzene	71-43-2	E611E	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Bromobenzene	108-86-1	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Bromochloromethane	74-97-5	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Bromodichloromethane	75-27-4	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Bromoform	75-25-2	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Bromomethane	74-83-9	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Butylbenzene, n-	104-51-8	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Butylbenzene, sec-	135-98-8	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Butylbenzene, tert-	98-06-6	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Carbon tetrachloride	56-23-5	E611E	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Chlorobenzene	108-90-7	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Chloroethane	75-00-3	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Chloroform	67-66-3	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Chloromethane	74-87-3	E611E	5.0	µg/L	<5.0	<5.0	0	Diff <2x LOR	----
		Chlorotoluene, 2-	95-49-8	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Chlorotoluene, 4-	106-43-4	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Cymene, p-	99-87-6	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dibromo-3-chloropropane, 1,2-	96-12-8	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dibromochloromethane	124-48-1	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dibromoethane, 1,2-	106-93-4	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dibromomethane	74-95-3	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dichlorobenzene, 1,2-	95-50-1	E611E	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Dichlorobenzene, 1,3-	541-73-1	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dichlorobenzene, 1,4-	106-46-7	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dichlorodifluoromethane	75-71-8	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dichloroethane, 1,1-	75-34-3	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dichloroethane, 1,2-	107-06-2	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----

Sub-Matrix: **Water**

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Laboratory Duplicate (DUP) Report						
					LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Volatile Organic Compounds (QC Lot: 998108) - continued											
EO2304968-016	MW-22B	Dichloroethylene, 1,1-	75-35-4	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dichloroethylene, cis-1,2-	156-59-2	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dichloroethylene, trans-1,2-	156-60-5	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dichloromethane	75-09-2	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dichloropropane, 1,2-	78-87-5	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dichloropropane, 1,3-	142-28-9	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dichloropropane, 2,2-	594-20-7	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dichloropropylene, 1,1-	563-58-6	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dichloropropylene, cis-1,3-	10061-01-5	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dichloropropylene, trans-1,3-	10061-02-6	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Ethylbenzene	100-41-4	E611E	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Hexachlorobutadiene	87-68-3	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Isopropylbenzene	98-82-8	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Methyl-tert-butyl ether [MTBE]	1634-04-4	E611E	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Propylbenzene, n-	103-65-1	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Styrene	100-42-5	E611E	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Tetrachloroethane, 1,1,1,2-	630-20-6	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Tetrachloroethane, 1,1,2,2-	79-34-5	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Tetrachloroethylene	127-18-4	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Toluene	108-88-3	E611E	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Trichlorobenzene, 1,2,3-	87-61-6	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Trichlorobenzene, 1,2,4-	120-82-1	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Trichloroethane, 1,1,1-	71-55-6	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Trichloroethane, 1,1,2-	79-00-5	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Trichloroethylene	79-01-6	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Trichlorofluoromethane	75-69-4	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Trichloropropane, 1,2,3-	96-18-4	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Trimethylbenzene, 1,2,4-	95-63-6	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Trimethylbenzene, 1,3,5-	108-67-8	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Vinyl chloride	75-01-4	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Xylene, m+p-	179601-23-1	E611E	0.40	µg/L	0.41	<0.40	0.01	Diff <2x LOR	----
		Xylene, o-	95-47-6	E611E	0.30	µg/L	<0.30	<0.30	0	Diff <2x LOR	----
Volatile Organic Compounds (QC Lot: 998109)											
EO2304968-016	MW-22B	Benzene	71-43-2	E611A	0.50	µg/L	<0.00050 mg/L	<0.50	0	Diff <2x LOR	----

Sub-Matrix: **Water**

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Laboratory Duplicate (DUP) Report						
					LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Volatile Organic Compounds (QC Lot: 998109) - continued											
EO2304968-016	MW-22B	Ethylbenzene	100-41-4	E611A	0.50	µg/L	<0.00050 mg/L	<0.50	0	Diff <2x LOR	----
		Styrene	100-42-5	E611A	0.50	µg/L	<0.00050 mg/L	<0.50	0	Diff <2x LOR	----
		Toluene	108-88-3	E611A	0.50	µg/L	<0.00050 mg/L	<0.50	0	Diff <2x LOR	----
		Xylene, m+p-	179601-23-1	E611A	0.40	µg/L	0.00041 mg/L	<0.40	0.01	Diff <2x LOR	----
		Xylene, o-	95-47-6	E611A	0.30	µg/L	<0.00030 mg/L	<0.30	0	Diff <2x LOR	----
Hydrocarbons (QC Lot: 1000807)											
EO2304968-036	MW-33B	F1 (C6-C10)	----	E581.F1	100	µg/L	<0.10 mg/L	<100	0	Diff <2x LOR	----
Hydrocarbons (QC Lot: 996594)											
EO2304959-001	Anonymous	F1 (C6-C10)	----	E581.F1	100	µg/L	<100	<100	0	Diff <2x LOR	----
Hydrocarbons (QC Lot: 998110)											
EO2304968-016	MW-22B	F1 (C6-C10)	----	E581.F1	100	µg/L	<0.10 mg/L	<100	0	Diff <2x LOR	----

Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 1000348)						
Conductivity	----	E100	1	µS/cm	<1.0	----
Physical Tests (QCLot: 1000349)						
Alkalinity, total (as CaCO3)	----	E290	1	mg/L	<1.0	----
Physical Tests (QCLot: 1000353)						
Alkalinity, total (as CaCO3)	----	E290	1	mg/L	<1.0	----
Physical Tests (QCLot: 1000355)						
Conductivity	----	E100	1	µS/cm	<1.0	----
Physical Tests (QCLot: 1000356)						
Alkalinity, total (as CaCO3)	----	E290	1	mg/L	<1.0	----
Physical Tests (QCLot: 1000358)						
Conductivity	----	E100	1	µS/cm	<1.0	----
Anions and Nutrients (QCLot: 1000106)						
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	<0.050	----
Anions and Nutrients (QCLot: 1000107)						
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	<0.050	----
Anions and Nutrients (QCLot: 1000108)						
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	<0.050	----
Anions and Nutrients (QCLot: 1001127)						
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 1001471)						
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 1003447)						
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 1003460)						
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 997148)						
Fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 997149)						
Nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 997150)						
Nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	<0.010	----
Anions and Nutrients (QCLot: 997151)						

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Anions and Nutrients (QCLot: 997151) - continued						
Chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 997152)						
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 997153)						
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 997154)						
Nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 997155)						
Nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	<0.010	----
Anions and Nutrients (QCLot: 997156)						
Fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 997157)						
Chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 997162)						
Fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 997165)						
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 997166)						
Nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 997167)						
Nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	<0.010	----
Anions and Nutrients (QCLot: 997168)						
Chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Organic / Inorganic Carbon (QCLot: 997116)						
Carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	<0.50	----
Organic / Inorganic Carbon (QCLot: 997117)						
Carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	<0.50	----
Organic / Inorganic Carbon (QCLot: 997118)						
Carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	<0.50	----
Total Metals (QCLot: 1004768)						
Mercury, total	7439-97-6	E508	0.000005	mg/L	<0.0000050	----
Total Metals (QCLot: 998151)						
Aluminum, total	7429-90-5	E420	0.003	mg/L	<0.0030	----
Antimony, total	7440-36-0	E420	0.0001	mg/L	<0.00010	----
Arsenic, total	7440-38-2	E420	0.0001	mg/L	<0.00010	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Total Metals (QCLot: 998151) - continued						
Barium, total	7440-39-3	E420	0.0001	mg/L	<0.00010	----
Beryllium, total	7440-41-7	E420	0.00002	mg/L	<0.000020	----
Bismuth, total	7440-69-9	E420	0.00005	mg/L	<0.000050	----
Boron, total	7440-42-8	E420	0.01	mg/L	<0.010	----
Cadmium, total	7440-43-9	E420	0.000005	mg/L	<0.0000050	----
Calcium, total	7440-70-2	E420	0.05	mg/L	<0.050	----
Cesium, total	7440-46-2	E420	0.00001	mg/L	<0.000010	----
Chromium, total	7440-47-3	E420	0.0005	mg/L	<0.00050	----
Cobalt, total	7440-48-4	E420	0.0001	mg/L	<0.00010	----
Copper, total	7440-50-8	E420	0.0005	mg/L	<0.00050	----
Iron, total	7439-89-6	E420	0.01	mg/L	<0.010	----
Lead, total	7439-92-1	E420	0.00005	mg/L	<0.000050	----
Lithium, total	7439-93-2	E420	0.001	mg/L	<0.0010	----
Magnesium, total	7439-95-4	E420	0.005	mg/L	<0.0050	----
Manganese, total	7439-96-5	E420	0.0001	mg/L	<0.00010	----
Molybdenum, total	7439-98-7	E420	0.00005	mg/L	<0.000050	----
Nickel, total	7440-02-0	E420	0.0005	mg/L	<0.00050	----
Phosphorus, total	7723-14-0	E420	0.05	mg/L	<0.050	----
Potassium, total	7440-09-7	E420	0.05	mg/L	<0.050	----
Rubidium, total	7440-17-7	E420	0.0002	mg/L	<0.00020	----
Selenium, total	7782-49-2	E420	0.00005	mg/L	<0.000050	----
Silicon, total	7440-21-3	E420	0.1	mg/L	<0.10	----
Silver, total	7440-22-4	E420	0.00001	mg/L	<0.000010	----
Sodium, total	7440-23-5	E420	0.05	mg/L	<0.050	----
Strontium, total	7440-24-6	E420	0.0002	mg/L	<0.00020	----
Sulfur, total	7704-34-9	E420	0.5	mg/L	<0.50	----
Tellurium, total	13494-80-9	E420	0.0002	mg/L	<0.00020	----
Thallium, total	7440-28-0	E420	0.00001	mg/L	<0.000010	----
Thorium, total	7440-29-1	E420	0.0001	mg/L	<0.00010	----
Tin, total	7440-31-5	E420	0.0001	mg/L	<0.00010	----
Titanium, total	7440-32-6	E420	0.0003	mg/L	<0.00030	----
Tungsten, total	7440-33-7	E420	0.0001	mg/L	<0.00010	----
Uranium, total	7440-61-1	E420	0.00001	mg/L	<0.000010	----
Vanadium, total	7440-62-2	E420	0.0005	mg/L	<0.00050	----
Zinc, total	7440-66-6	E420	0.003	mg/L	<0.0030	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Total Metals (QCLot: 998151) - continued						
Zirconium, total	7440-67-7	E420	0.0002	mg/L	<0.00020	----
Dissolved Metals (QCLot: 996670)						
Mercury, dissolved	7439-97-6	E509	0.000005	mg/L	<0.0000050	----
Dissolved Metals (QCLot: 996671)						
Mercury, dissolved	7439-97-6	E509	0.000005	mg/L	<0.0000050	----
Dissolved Metals (QCLot: 996672)						
Mercury, dissolved	7439-97-6	E509	0.000005	mg/L	<0.0000050	----
Dissolved Metals (QCLot: 998152)						
Aluminum, dissolved	7429-90-5	E421	0.001	mg/L	<0.0010	----
Antimony, dissolved	7440-36-0	E421	0.0001	mg/L	<0.00010	----
Arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	<0.00010	----
Barium, dissolved	7440-39-3	E421	0.0001	mg/L	<0.00010	----
Beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	<0.000020	----
Bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	<0.000050	----
Boron, dissolved	7440-42-8	E421	0.01	mg/L	<0.010	----
Cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	<0.0000050	----
Calcium, dissolved	7440-70-2	E421	0.05	mg/L	<0.050	----
Cesium, dissolved	7440-46-2	E421	0.00001	mg/L	<0.000010	----
Chromium, dissolved	7440-47-3	E421	0.0005	mg/L	<0.00050	----
Cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	<0.00010	----
Copper, dissolved	7440-50-8	E421	0.0002	mg/L	<0.00020	----
Iron, dissolved	7439-89-6	E421	0.01	mg/L	<0.010	----
Lead, dissolved	7439-92-1	E421	0.00005	mg/L	<0.000050	----
Lithium, dissolved	7439-93-2	E421	0.001	mg/L	<0.0010	----
Magnesium, dissolved	7439-95-4	E421	0.005	mg/L	<0.0050	----
Manganese, dissolved	7439-96-5	E421	0.0001	mg/L	<0.00010	----
Molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	<0.000050	----
Nickel, dissolved	7440-02-0	E421	0.0005	mg/L	<0.00050	----
Phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	<0.050	----
Potassium, dissolved	7440-09-7	E421	0.05	mg/L	<0.050	----
Rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	<0.00020	----
Selenium, dissolved	7782-49-2	E421	0.00005	mg/L	<0.000050	----
Silicon, dissolved	7440-21-3	E421	0.05	mg/L	<0.050	----
Silver, dissolved	7440-22-4	E421	0.00001	mg/L	<0.000010	----
Sodium, dissolved	7440-23-5	E421	0.05	mg/L	<0.050	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Dissolved Metals (QCLot: 998152) - continued						
Strontium, dissolved	7440-24-6	E421	0.0002	mg/L	<0.00020	----
Sulfur, dissolved	7704-34-9	E421	0.5	mg/L	<0.50	----
Tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	<0.00020	----
Thallium, dissolved	7440-28-0	E421	0.00001	mg/L	<0.000010	----
Thorium, dissolved	7440-29-1	E421	0.0001	mg/L	<0.00010	----
Tin, dissolved	7440-31-5	E421	0.0001	mg/L	<0.00010	----
Titanium, dissolved	7440-32-6	E421	0.0003	mg/L	<0.00030	----
Tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	<0.00010	----
Uranium, dissolved	7440-61-1	E421	0.00001	mg/L	<0.000010	----
Vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	<0.00050	----
Zinc, dissolved	7440-66-6	E421	0.001	mg/L	<0.0010	----
Zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	<0.00020	----
Dissolved Metals (QCLot: 998153)						
Aluminum, dissolved	7429-90-5	E421	0.001	mg/L	<0.0010	----
Antimony, dissolved	7440-36-0	E421	0.0001	mg/L	<0.00010	----
Arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	<0.00010	----
Barium, dissolved	7440-39-3	E421	0.0001	mg/L	<0.00010	----
Beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	<0.000020	----
Bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	<0.000050	----
Boron, dissolved	7440-42-8	E421	0.01	mg/L	<0.010	----
Cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	<0.0000050	----
Calcium, dissolved	7440-70-2	E421	0.05	mg/L	<0.050	----
Cesium, dissolved	7440-46-2	E421	0.00001	mg/L	<0.000010	----
Chromium, dissolved	7440-47-3	E421	0.0005	mg/L	<0.00050	----
Cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	<0.00010	----
Copper, dissolved	7440-50-8	E421	0.0002	mg/L	<0.00020	----
Iron, dissolved	7439-89-6	E421	0.01	mg/L	<0.010	----
Lead, dissolved	7439-92-1	E421	0.00005	mg/L	<0.000050	----
Lithium, dissolved	7439-93-2	E421	0.001	mg/L	<0.0010	----
Magnesium, dissolved	7439-95-4	E421	0.005	mg/L	<0.0050	----
Manganese, dissolved	7439-96-5	E421	0.0001	mg/L	<0.00010	----
Molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	<0.000050	----
Nickel, dissolved	7440-02-0	E421	0.0005	mg/L	<0.00050	----
Phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	<0.050	----
Potassium, dissolved	7440-09-7	E421	0.05	mg/L	<0.050	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Dissolved Metals (QCLot: 998153) - continued						
Rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	<0.00020	----
Selenium, dissolved	7782-49-2	E421	0.00005	mg/L	<0.000050	----
Silicon, dissolved	7440-21-3	E421	0.05	mg/L	<0.050	----
Silver, dissolved	7440-22-4	E421	0.00001	mg/L	<0.000010	----
Sodium, dissolved	7440-23-5	E421	0.05	mg/L	<0.050	----
Strontium, dissolved	7440-24-6	E421	0.0002	mg/L	<0.00020	----
Sulfur, dissolved	7704-34-9	E421	0.5	mg/L	<0.50	----
Tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	<0.00020	----
Thallium, dissolved	7440-28-0	E421	0.00001	mg/L	<0.000010	----
Thorium, dissolved	7440-29-1	E421	0.0001	mg/L	<0.00010	----
Tin, dissolved	7440-31-5	E421	0.0001	mg/L	<0.00010	----
Titanium, dissolved	7440-32-6	E421	0.0003	mg/L	<0.00030	----
Tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	<0.00010	----
Uranium, dissolved	7440-61-1	E421	0.00001	mg/L	<0.000010	----
Vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	<0.00050	----
Zinc, dissolved	7440-66-6	E421	0.001	mg/L	<0.0010	----
Zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	<0.00020	----
Dissolved Metals (QCLot: 998154)						
Aluminum, dissolved	7429-90-5	E421	0.001	mg/L	<0.0010	----
Antimony, dissolved	7440-36-0	E421	0.0001	mg/L	<0.00010	----
Arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	<0.00010	----
Barium, dissolved	7440-39-3	E421	0.0001	mg/L	<0.00010	----
Beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	<0.000020	----
Bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	<0.000050	----
Boron, dissolved	7440-42-8	E421	0.01	mg/L	<0.010	----
Cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	<0.0000050	----
Calcium, dissolved	7440-70-2	E421	0.05	mg/L	<0.050	----
Cesium, dissolved	7440-46-2	E421	0.00001	mg/L	<0.000010	----
Chromium, dissolved	7440-47-3	E421	0.0005	mg/L	<0.00050	----
Cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	<0.00010	----
Copper, dissolved	7440-50-8	E421	0.0002	mg/L	<0.00020	----
Iron, dissolved	7439-89-6	E421	0.01	mg/L	<0.010	----
Lead, dissolved	7439-92-1	E421	0.00005	mg/L	<0.000050	----
Lithium, dissolved	7439-93-2	E421	0.001	mg/L	<0.0010	----
Magnesium, dissolved	7439-95-4	E421	0.005	mg/L	<0.0050	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Dissolved Metals (QCLot: 998154) - continued						
Manganese, dissolved	7439-96-5	E421	0.0001	mg/L	<0.00010	----
Molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	<0.000050	----
Nickel, dissolved	7440-02-0	E421	0.0005	mg/L	<0.00050	----
Phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	<0.050	----
Potassium, dissolved	7440-09-7	E421	0.05	mg/L	<0.050	----
Rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	<0.00020	----
Selenium, dissolved	7782-49-2	E421	0.00005	mg/L	<0.000050	----
Silicon, dissolved	7440-21-3	E421	0.05	mg/L	<0.050	----
Silver, dissolved	7440-22-4	E421	0.00001	mg/L	<0.000010	----
Sodium, dissolved	7440-23-5	E421	0.05	mg/L	<0.050	----
Strontium, dissolved	7440-24-6	E421	0.0002	mg/L	<0.00020	----
Sulfur, dissolved	7704-34-9	E421	0.5	mg/L	<0.50	----
Tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	<0.00020	----
Thallium, dissolved	7440-28-0	E421	0.00001	mg/L	<0.000010	----
Thorium, dissolved	7440-29-1	E421	0.0001	mg/L	<0.00010	----
Tin, dissolved	7440-31-5	E421	0.0001	mg/L	<0.00010	----
Titanium, dissolved	7440-32-6	E421	0.0003	mg/L	<0.00030	----
Tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	<0.00010	----
Uranium, dissolved	7440-61-1	E421	0.00001	mg/L	<0.000010	----
Vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	<0.00050	----
Zinc, dissolved	7440-66-6	E421	0.001	mg/L	<0.0010	----
Zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	<0.00020	----
Aggregate Organics (QCLot: 1000147)						
Phenols, total (4AAP)	----	E562	0.001	mg/L	<0.0010	----
Aggregate Organics (QCLot: 1000152)						
Phenols, total (4AAP)	----	E562	0.001	mg/L	<0.0010	----
Aggregate Organics (QCLot: 1003714)						
Phenols, total (4AAP)	----	E562	0.001	mg/L	<0.0010	----
Volatile Organic Compounds (QCLot: 1000805)						
Benzene	71-43-2	E611E	0.5	µg/L	<0.50	----
Bromobenzene	108-86-1	E611E	1	µg/L	<1.0	----
Bromochloromethane	74-97-5	E611E	1	µg/L	<1.0	----
Bromodichloromethane	75-27-4	E611E	1	µg/L	<1.0	----
Bromoform	75-25-2	E611E	1	µg/L	<1.0	----
Bromomethane	74-83-9	E611E	1	µg/L	<1.0	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Volatile Organic Compounds (QCLot: 1000805) - continued						
Butylbenzene, n-	104-51-8	E611E	1	µg/L	<1.0	----
Butylbenzene, sec-	135-98-8	E611E	1	µg/L	<1.0	----
Butylbenzene, tert-	98-06-6	E611E	1	µg/L	<1.0	----
Carbon tetrachloride	56-23-5	E611E	0.5	µg/L	<0.50	----
Chlorobenzene	108-90-7	E611E	1	µg/L	<1.0	----
Chloroethane	75-00-3	E611E	1	µg/L	<1.0	----
Chloroform	67-66-3	E611E	1	µg/L	<1.0	----
Chloromethane	74-87-3	E611E	5	µg/L	<5.0	----
Chlorotoluene, 2-	95-49-8	E611E	1	µg/L	<1.0	----
Chlorotoluene, 4-	106-43-4	E611E	1	µg/L	<1.0	----
Cymene, p-	99-87-6	E611E	1	µg/L	<1.0	----
Dibromo-3-chloropropane, 1,2-	96-12-8	E611E	1	µg/L	<1.0	----
Dibromochloromethane	124-48-1	E611E	1	µg/L	<1.0	----
Dibromoethane, 1,2-	106-93-4	E611E	1	µg/L	<1.0	----
Dibromomethane	74-95-3	E611E	1	µg/L	<1.0	----
Dichlorobenzene, 1,2-	95-50-1	E611E	0.5	µg/L	<0.50	----
Dichlorobenzene, 1,3-	541-73-1	E611E	1	µg/L	<1.0	----
Dichlorobenzene, 1,4-	106-46-7	E611E	1	µg/L	<1.0	----
Dichlorodifluoromethane	75-71-8	E611E	1	µg/L	<1.0	----
Dichloroethane, 1,1-	75-34-3	E611E	1	µg/L	<1.0	----
Dichloroethane, 1,2-	107-06-2	E611E	1	µg/L	<1.0	----
Dichloroethylene, 1,1-	75-35-4	E611E	1	µg/L	<1.0	----
Dichloroethylene, cis-1,2-	156-59-2	E611E	1	µg/L	<1.0	----
Dichloroethylene, trans-1,2-	156-60-5	E611E	1	µg/L	<1.0	----
Dichloromethane	75-09-2	E611E	1	µg/L	<1.0	----
Dichloropropane, 1,2-	78-87-5	E611E	1	µg/L	<1.0	----
Dichloropropane, 1,3-	142-28-9	E611E	1	µg/L	<1.0	----
Dichloropropane, 2,2-	594-20-7	E611E	1	µg/L	<1.0	----
Dichloropropylene, 1,1-	563-58-6	E611E	1	µg/L	<1.0	----
Dichloropropylene, cis-1,3-	10061-01-5	E611E	1	µg/L	<1.0	----
Dichloropropylene, trans-1,3-	10061-02-6	E611E	1	µg/L	<1.0	----
Ethylbenzene	100-41-4	E611E	0.5	µg/L	<0.50	----
Hexachlorobutadiene	87-68-3	E611E	1	µg/L	<1.0	----
Isopropylbenzene	98-82-8	E611E	1	µg/L	<1.0	----
Methyl-tert-butyl ether [MTBE]	1634-04-4	E611E	0.5	µg/L	<0.50	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Volatile Organic Compounds (QCLot: 1000805) - continued						
Propylbenzene, n-	103-65-1	E611E	1	µg/L	<1.0	----
Styrene	100-42-5	E611E	0.5	µg/L	<0.50	----
Tetrachloroethane, 1,1,1,2-	630-20-6	E611E	1	µg/L	<1.0	----
Tetrachloroethane, 1,1,2,2-	79-34-5	E611E	1	µg/L	<1.0	----
Tetrachloroethylene	127-18-4	E611E	1	µg/L	<1.0	----
Toluene	108-88-3	E611E	0.5	µg/L	<0.50	----
Trichlorobenzene, 1,2,3-	87-61-6	E611E	1	µg/L	<1.0	----
Trichlorobenzene, 1,2,4-	120-82-1	E611E	1	µg/L	<1.0	----
Trichloroethane, 1,1,1-	71-55-6	E611E	1	µg/L	<1.0	----
Trichloroethane, 1,1,2-	79-00-5	E611E	1	µg/L	<1.0	----
Trichloroethylene	79-01-6	E611E	1	µg/L	<1.0	----
Trichlorofluoromethane	75-69-4	E611E	1	µg/L	<1.0	----
Trichloropropane, 1,2,3-	96-18-4	E611E	1	µg/L	<1.0	----
Trimethylbenzene, 1,2,4-	95-63-6	E611E	1	µg/L	<1.0	----
Trimethylbenzene, 1,3,5-	108-67-8	E611E	1	µg/L	<1.0	----
Vinyl chloride	75-01-4	E611E	1	µg/L	<1.0	----
Xylene, m+p-	179601-23-1	E611E	0.4	µg/L	<0.40	----
Xylene, o-	95-47-6	E611E	0.3	µg/L	<0.30	----
Volatile Organic Compounds (QCLot: 1000806)						
Benzene	71-43-2	E611A	0.5	µg/L	<0.50	----
Ethylbenzene	100-41-4	E611A	0.5	µg/L	<0.50	----
Styrene	100-42-5	E611A	0.5	µg/L	<0.50	----
Toluene	108-88-3	E611A	0.5	µg/L	<0.50	----
Xylene, m+p-	179601-23-1	E611A	0.4	µg/L	<0.40	----
Xylene, o-	95-47-6	E611A	0.3	µg/L	<0.30	----
Volatile Organic Compounds (QCLot: 996595)						
Benzene	71-43-2	E611A	0.5	µg/L	<0.50	----
Ethylbenzene	100-41-4	E611A	0.5	µg/L	<0.50	----
Styrene	100-42-5	E611A	0.5	µg/L	<0.50	----
Toluene	108-88-3	E611A	0.5	µg/L	<0.50	----
Xylene, m+p-	179601-23-1	E611A	0.4	µg/L	<0.40	----
Xylene, o-	95-47-6	E611A	0.3	µg/L	<0.30	----
Volatile Organic Compounds (QCLot: 996596)						
Benzene	71-43-2	E611E	0.5	µg/L	<0.50	----
Bromobenzene	108-86-1	E611E	1	µg/L	<1.0	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Volatile Organic Compounds (QCLot: 996596) - continued						
Bromochloromethane	74-97-5	E611E	1	µg/L	<1.0	----
Bromodichloromethane	75-27-4	E611E	1	µg/L	<1.0	----
Bromoform	75-25-2	E611E	1	µg/L	<1.0	----
Bromomethane	74-83-9	E611E	1	µg/L	<1.0	----
Butylbenzene, n-	104-51-8	E611E	1	µg/L	<1.0	----
Butylbenzene, sec-	135-98-8	E611E	1	µg/L	<1.0	----
Butylbenzene, tert-	98-06-6	E611E	1	µg/L	<1.0	----
Carbon tetrachloride	56-23-5	E611E	0.5	µg/L	<0.50	----
Chlorobenzene	108-90-7	E611E	1	µg/L	<1.0	----
Chloroethane	75-00-3	E611E	1	µg/L	<1.0	----
Chloroform	67-66-3	E611E	1	µg/L	<1.0	----
Chloromethane	74-87-3	E611E	5	µg/L	<5.0	----
Chlorotoluene, 2-	95-49-8	E611E	1	µg/L	<1.0	----
Chlorotoluene, 4-	106-43-4	E611E	1	µg/L	<1.0	----
Cymene, p-	99-87-6	E611E	1	µg/L	<1.0	----
Dibromo-3-chloropropane, 1,2-	96-12-8	E611E	1	µg/L	<1.0	----
Dibromochloromethane	124-48-1	E611E	1	µg/L	<1.0	----
Dibromoethane, 1,2-	106-93-4	E611E	1	µg/L	<1.0	----
Dibromomethane	74-95-3	E611E	1	µg/L	<1.0	----
Dichlorobenzene, 1,2-	95-50-1	E611E	0.5	µg/L	<0.50	----
Dichlorobenzene, 1,3-	541-73-1	E611E	1	µg/L	<1.0	----
Dichlorobenzene, 1,4-	106-46-7	E611E	1	µg/L	<1.0	----
Dichlorodifluoromethane	75-71-8	E611E	1	µg/L	<1.0	----
Dichloroethane, 1,1-	75-34-3	E611E	1	µg/L	<1.0	----
Dichloroethane, 1,2-	107-06-2	E611E	1	µg/L	<1.0	----
Dichloroethylene, 1,1-	75-35-4	E611E	1	µg/L	<1.0	----
Dichloroethylene, cis-1,2-	156-59-2	E611E	1	µg/L	<1.0	----
Dichloroethylene, trans-1,2-	156-60-5	E611E	1	µg/L	<1.0	----
Dichloromethane	75-09-2	E611E	1	µg/L	<1.0	----
Dichloropropane, 1,2-	78-87-5	E611E	1	µg/L	<1.0	----
Dichloropropane, 1,3-	142-28-9	E611E	1	µg/L	<1.0	----
Dichloropropane, 2,2-	594-20-7	E611E	1	µg/L	<1.0	----
Dichloropropylene, 1,1-	563-58-6	E611E	1	µg/L	<1.0	----
Dichloropropylene, cis-1,3-	10061-01-5	E611E	1	µg/L	<1.0	----
Dichloropropylene, trans-1,3-	10061-02-6	E611E	1	µg/L	<1.0	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Volatile Organic Compounds (QCLot: 996596) - continued						
Ethylbenzene	100-41-4	E611E	0.5	µg/L	<0.50	----
Hexachlorobutadiene	87-68-3	E611E	1	µg/L	<1.0	----
Isopropylbenzene	98-82-8	E611E	1	µg/L	<1.0	----
Methyl-tert-butyl ether [MTBE]	1634-04-4	E611E	0.5	µg/L	<0.50	----
Propylbenzene, n-	103-65-1	E611E	1	µg/L	<1.0	----
Styrene	100-42-5	E611E	0.5	µg/L	<0.50	----
Tetrachloroethane, 1,1,1,2-	630-20-6	E611E	1	µg/L	<1.0	----
Tetrachloroethane, 1,1,2,2-	79-34-5	E611E	1	µg/L	<1.0	----
Tetrachloroethylene	127-18-4	E611E	1	µg/L	<1.0	----
Toluene	108-88-3	E611E	0.5	µg/L	<0.50	----
Trichlorobenzene, 1,2,3-	87-61-6	E611E	1	µg/L	<1.0	----
Trichlorobenzene, 1,2,4-	120-82-1	E611E	1	µg/L	<1.0	----
Trichloroethane, 1,1,1-	71-55-6	E611E	1	µg/L	<1.0	----
Trichloroethane, 1,1,2-	79-00-5	E611E	1	µg/L	<1.0	----
Trichloroethylene	79-01-6	E611E	1	µg/L	<1.0	----
Trichlorofluoromethane	75-69-4	E611E	1	µg/L	<1.0	----
Trichloropropane, 1,2,3-	96-18-4	E611E	1	µg/L	<1.0	----
Trimethylbenzene, 1,2,4-	95-63-6	E611E	1	µg/L	<1.0	----
Trimethylbenzene, 1,3,5-	108-67-8	E611E	1	µg/L	<1.0	----
Vinyl chloride	75-01-4	E611E	1	µg/L	<1.0	----
Xylene, m+p-	179601-23-1	E611E	0.4	µg/L	<0.40	----
Xylene, o-	95-47-6	E611E	0.3	µg/L	<0.30	----
Volatile Organic Compounds (QCLot: 998108)						
Benzene	71-43-2	E611E	0.5	µg/L	<0.50	----
Bromobenzene	108-86-1	E611E	1	µg/L	<1.0	----
Bromochloromethane	74-97-5	E611E	1	µg/L	<1.0	----
Bromodichloromethane	75-27-4	E611E	1	µg/L	<1.0	----
Bromoform	75-25-2	E611E	1	µg/L	<1.0	----
Bromomethane	74-83-9	E611E	1	µg/L	<1.0	----
Butylbenzene, n-	104-51-8	E611E	1	µg/L	<1.0	----
Butylbenzene, sec-	135-98-8	E611E	1	µg/L	<1.0	----
Butylbenzene, tert-	98-06-6	E611E	1	µg/L	<1.0	----
Carbon tetrachloride	56-23-5	E611E	0.5	µg/L	<0.50	----
Chlorobenzene	108-90-7	E611E	1	µg/L	<1.0	----
Chloroethane	75-00-3	E611E	1	µg/L	<1.0	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Volatile Organic Compounds (QCLot: 998108) - continued						
Chloroform	67-66-3	E611E	1	µg/L	<1.0	----
Chloromethane	74-87-3	E611E	5	µg/L	<5.0	----
Chlorotoluene, 2-	95-49-8	E611E	1	µg/L	<1.0	----
Chlorotoluene, 4-	106-43-4	E611E	1	µg/L	<1.0	----
Cymene, p-	99-87-6	E611E	1	µg/L	<1.0	----
Dibromo-3-chloropropane, 1,2-	96-12-8	E611E	1	µg/L	<1.0	----
Dibromochloromethane	124-48-1	E611E	1	µg/L	<1.0	----
Dibromoethane, 1,2-	106-93-4	E611E	1	µg/L	<1.0	----
Dibromomethane	74-95-3	E611E	1	µg/L	<1.0	----
Dichlorobenzene, 1,2-	95-50-1	E611E	0.5	µg/L	<0.50	----
Dichlorobenzene, 1,3-	541-73-1	E611E	1	µg/L	<1.0	----
Dichlorobenzene, 1,4-	106-46-7	E611E	1	µg/L	<1.0	----
Dichlorodifluoromethane	75-71-8	E611E	1	µg/L	<1.0	----
Dichloroethane, 1,1-	75-34-3	E611E	1	µg/L	<1.0	----
Dichloroethane, 1,2-	107-06-2	E611E	1	µg/L	<1.0	----
Dichloroethylene, 1,1-	75-35-4	E611E	1	µg/L	<1.0	----
Dichloroethylene, cis-1,2-	156-59-2	E611E	1	µg/L	<1.0	----
Dichloroethylene, trans-1,2-	156-60-5	E611E	1	µg/L	<1.0	----
Dichloromethane	75-09-2	E611E	1	µg/L	<1.0	----
Dichloropropane, 1,2-	78-87-5	E611E	1	µg/L	<1.0	----
Dichloropropane, 1,3-	142-28-9	E611E	1	µg/L	<1.0	----
Dichloropropane, 2,2-	594-20-7	E611E	1	µg/L	<1.0	----
Dichloropropylene, 1,1-	563-58-6	E611E	1	µg/L	<1.0	----
Dichloropropylene, cis-1,3-	10061-01-5	E611E	1	µg/L	<1.0	----
Dichloropropylene, trans-1,3-	10061-02-6	E611E	1	µg/L	<1.0	----
Ethylbenzene	100-41-4	E611E	0.5	µg/L	<0.50	----
Hexachlorobutadiene	87-68-3	E611E	1	µg/L	<1.0	----
Isopropylbenzene	98-82-8	E611E	1	µg/L	<1.0	----
Methyl-tert-butyl ether [MTBE]	1634-04-4	E611E	0.5	µg/L	<0.50	----
Propylbenzene, n-	103-65-1	E611E	1	µg/L	<1.0	----
Styrene	100-42-5	E611E	0.5	µg/L	<0.50	----
Tetrachloroethane, 1,1,1,2-	630-20-6	E611E	1	µg/L	<1.0	----
Tetrachloroethane, 1,1,2,2-	79-34-5	E611E	1	µg/L	<1.0	----
Tetrachloroethylene	127-18-4	E611E	1	µg/L	<1.0	----
Toluene	108-88-3	E611E	0.5	µg/L	<0.50	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Volatile Organic Compounds (QCLot: 998108) - continued						
Trichlorobenzene, 1,2,3-	87-61-6	E611E	1	µg/L	<1.0	----
Trichlorobenzene, 1,2,4-	120-82-1	E611E	1	µg/L	<1.0	----
Trichloroethane, 1,1,1-	71-55-6	E611E	1	µg/L	<1.0	----
Trichloroethane, 1,1,2-	79-00-5	E611E	1	µg/L	<1.0	----
Trichloroethylene	79-01-6	E611E	1	µg/L	<1.0	----
Trichlorofluoromethane	75-69-4	E611E	1	µg/L	<1.0	----
Trichloropropane, 1,2,3-	96-18-4	E611E	1	µg/L	<1.0	----
Trimethylbenzene, 1,2,4-	95-63-6	E611E	1	µg/L	<1.0	----
Trimethylbenzene, 1,3,5-	108-67-8	E611E	1	µg/L	<1.0	----
Vinyl chloride	75-01-4	E611E	1	µg/L	<1.0	----
Xylene, m+p-	179601-23-1	E611E	0.4	µg/L	<0.40	----
Xylene, o-	95-47-6	E611E	0.3	µg/L	<0.30	----
Volatile Organic Compounds (QCLot: 998109)						
Benzene	71-43-2	E611A	0.5	µg/L	<0.50	----
Ethylbenzene	100-41-4	E611A	0.5	µg/L	<0.50	----
Styrene	100-42-5	E611A	0.5	µg/L	<0.50	----
Toluene	108-88-3	E611A	0.5	µg/L	<0.50	----
Xylene, m+p-	179601-23-1	E611A	0.4	µg/L	<0.40	----
Xylene, o-	95-47-6	E611A	0.3	µg/L	<0.30	----
Hydrocarbons (QCLot: 1000807)						
F1 (C6-C10)	----	E581.F1	100	µg/L	<100	----
Hydrocarbons (QCLot: 996594)						
F1 (C6-C10)	----	E581.F1	100	µg/L	<100	----
Hydrocarbons (QCLot: 997762)						
F2 (C10-C16)	----	E601	100	µg/L	<100	----
Hydrocarbons (QCLot: 997770)						
F2 (C10-C16)	----	E601	100	µg/L	<100	----
Hydrocarbons (QCLot: 998110)						
F1 (C6-C10)	----	E581.F1	100	µg/L	<100	----
Hydrocarbons (QCLot: 998218)						
F2 (C10-C16)	----	E601	100	µg/L	<100	----

Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 1000347)									
pH	----	E108	----	pH units	7 pH units	101	98.0	102	----
Physical Tests (QCLot: 1000348)									
Conductivity	----	E100	1	µS/cm	146.9 µS/cm	98.1	90.0	110	----
Physical Tests (QCLot: 1000349)									
Alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	98.5	85.0	115	----
Physical Tests (QCLot: 1000353)									
Alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	98.6	85.0	115	----
Physical Tests (QCLot: 1000354)									
pH	----	E108	----	pH units	7 pH units	101	98.0	102	----
Physical Tests (QCLot: 1000355)									
Conductivity	----	E100	1	µS/cm	146.9 µS/cm	105	90.0	110	----
Physical Tests (QCLot: 1000356)									
Alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	107	85.0	115	----
Physical Tests (QCLot: 1000357)									
pH	----	E108	----	pH units	7 pH units	101	98.0	102	----
Physical Tests (QCLot: 1000358)									
Conductivity	----	E100	1	µS/cm	146.9 µS/cm	105	90.0	110	----
Anions and Nutrients (QCLot: 1000106)									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	107	75.0	125	----
Anions and Nutrients (QCLot: 1000107)									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	107	75.0	125	----
Anions and Nutrients (QCLot: 1000108)									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	104	75.0	125	----
Anions and Nutrients (QCLot: 1001127)									
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	104	85.0	115	----
Anions and Nutrients (QCLot: 1001471)									
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	99.6	85.0	115	----
Anions and Nutrients (QCLot: 1003447)									
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	98.6	85.0	115	----
Anions and Nutrients (QCLot: 1003460)									
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	104	85.0	115	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
					Concentration	LCS	Low	High	Qualifier
Anions and Nutrients (QCLot: 997148)									
Fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	102	90.0	110	----
Anions and Nutrients (QCLot: 997149)									
Nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	2.5 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 997150)									
Nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	0.5 mg/L	96.3	90.0	110	----
Anions and Nutrients (QCLot: 997151)									
Chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	100	90.0	110	----
Anions and Nutrients (QCLot: 997152)									
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 997153)									
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 997154)									
Nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	2.5 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 997155)									
Nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	0.5 mg/L	96.1	90.0	110	----
Anions and Nutrients (QCLot: 997156)									
Fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	102	90.0	110	----
Anions and Nutrients (QCLot: 997157)									
Chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	100	90.0	110	----
Anions and Nutrients (QCLot: 997162)									
Fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	102	90.0	110	----
Anions and Nutrients (QCLot: 997165)									
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 997166)									
Nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	2.5 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 997167)									
Nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	0.5 mg/L	94.0	90.0	110	----
Anions and Nutrients (QCLot: 997168)									
Chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	101	90.0	110	----
Organic / Inorganic Carbon (QCLot: 997116)									
Carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	96.4	80.0	120	----
Organic / Inorganic Carbon (QCLot: 997117)									
Carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	92.8	80.0	120	----
Organic / Inorganic Carbon (QCLot: 997118)									

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Organic / Inorganic Carbon (QCLot: 997118) - continued									
Carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	91.6	80.0	120	----
Total Metals (QCLot: 1004768)									
Mercury, total	7439-97-6	E508	0.000005	mg/L	0.0001 mg/L	86.4	80.0	120	----
Total Metals (QCLot: 998151)									
Aluminum, total	7429-90-5	E420	0.003	mg/L	2 mg/L	109	80.0	120	----
Antimony, total	7440-36-0	E420	0.0001	mg/L	1 mg/L	103	80.0	120	----
Arsenic, total	7440-38-2	E420	0.0001	mg/L	1 mg/L	103	80.0	120	----
Barium, total	7440-39-3	E420	0.0001	mg/L	0.25 mg/L	99.4	80.0	120	----
Beryllium, total	7440-41-7	E420	0.00002	mg/L	0.1 mg/L	105	80.0	120	----
Bismuth, total	7440-69-9	E420	0.00005	mg/L	1 mg/L	97.1	80.0	120	----
Boron, total	7440-42-8	E420	0.01	mg/L	1 mg/L	108	80.0	120	----
Cadmium, total	7440-43-9	E420	0.000005	mg/L	0.1 mg/L	101	80.0	120	----
Calcium, total	7440-70-2	E420	0.05	mg/L	50 mg/L	98.3	80.0	120	----
Cesium, total	7440-46-2	E420	0.00001	mg/L	0.05 mg/L	99.1	80.0	120	----
Chromium, total	7440-47-3	E420	0.0005	mg/L	0.25 mg/L	102	80.0	120	----
Cobalt, total	7440-48-4	E420	0.0001	mg/L	0.25 mg/L	103	80.0	120	----
Copper, total	7440-50-8	E420	0.0005	mg/L	0.25 mg/L	96.7	80.0	120	----
Iron, total	7439-89-6	E420	0.01	mg/L	1 mg/L	120	80.0	120	----
Lead, total	7439-92-1	E420	0.00005	mg/L	0.5 mg/L	97.0	80.0	120	----
Lithium, total	7439-93-2	E420	0.001	mg/L	0.25 mg/L	111	80.0	120	----
Magnesium, total	7439-95-4	E420	0.005	mg/L	50 mg/L	107	80.0	120	----
Manganese, total	7439-96-5	E420	0.0001	mg/L	0.25 mg/L	103	80.0	120	----
Molybdenum, total	7439-98-7	E420	0.00005	mg/L	0.25 mg/L	102	80.0	120	----
Nickel, total	7440-02-0	E420	0.0005	mg/L	0.5 mg/L	100	80.0	120	----
Phosphorus, total	7723-14-0	E420	0.05	mg/L	10 mg/L	109	70.0	130	----
Potassium, total	7440-09-7	E420	0.05	mg/L	50 mg/L	105	80.0	120	----
Rubidium, total	7440-17-7	E420	0.0002	mg/L	0.1 mg/L	109	80.0	120	----
Selenium, total	7782-49-2	E420	0.00005	mg/L	1 mg/L	95.7	80.0	120	----
Silicon, total	7440-21-3	E420	0.1	mg/L	10 mg/L	108	60.0	140	----
Silver, total	7440-22-4	E420	0.00001	mg/L	0.1 mg/L	92.8	80.0	120	----
Sodium, total	7440-23-5	E420	0.05	mg/L	50 mg/L	105	80.0	120	----
Strontium, total	7440-24-6	E420	0.0002	mg/L	0.25 mg/L	104	80.0	120	----
Sulfur, total	7704-34-9	E420	0.5	mg/L	50 mg/L	110	80.0	120	----
Tellurium, total	13494-80-9	E420	0.0002	mg/L	0.1 mg/L	95.9	80.0	120	----
Thallium, total	7440-28-0	E420	0.00001	mg/L	1 mg/L	96.3	80.0	120	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
					Concentration	LCS	Low	High	Qualifier
Total Metals (QCLot: 998151) - continued									
Thorium, total	7440-29-1	E420	0.0001	mg/L	0.1 mg/L	98.2	80.0	120	----
Tin, total	7440-31-5	E420	0.0001	mg/L	0.5 mg/L	99.8	80.0	120	----
Titanium, total	7440-32-6	E420	0.0003	mg/L	0.25 mg/L	97.8	80.0	120	----
Tungsten, total	7440-33-7	E420	0.0001	mg/L	0.1 mg/L	97.3	80.0	120	----
Uranium, total	7440-61-1	E420	0.00001	mg/L	0.005 mg/L	95.6	80.0	120	----
Vanadium, total	7440-62-2	E420	0.0005	mg/L	0.5 mg/L	103	80.0	120	----
Zinc, total	7440-66-6	E420	0.003	mg/L	0.5 mg/L	97.5	80.0	120	----
Zirconium, total	7440-67-7	E420	0.0002	mg/L	0.1 mg/L	98.9	80.0	120	----
Mercury, dissolved	7439-97-6	E509	0.000005	mg/L	0.0001 mg/L	97.6	80.0	120	----
Mercury, dissolved	7439-97-6	E509	0.000005	mg/L	0.0001 mg/L	91.2	80.0	120	----
Mercury, dissolved	7439-97-6	E509	0.000005	mg/L	0.0001 mg/L	98.0	80.0	120	----
Dissolved Metals (QCLot: 998152)									
Aluminum, dissolved	7429-90-5	E421	0.001	mg/L	2 mg/L	105	80.0	120	----
Antimony, dissolved	7440-36-0	E421	0.0001	mg/L	1 mg/L	101	80.0	120	----
Arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	1 mg/L	104	80.0	120	----
Barium, dissolved	7440-39-3	E421	0.0001	mg/L	0.25 mg/L	100	80.0	120	----
Beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	0.1 mg/L	101	80.0	120	----
Bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	1 mg/L	98.1	80.0	120	----
Boron, dissolved	7440-42-8	E421	0.01	mg/L	1 mg/L	102	80.0	120	----
Cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	0.1 mg/L	102	80.0	120	----
Calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	97.2	80.0	120	----
Cesium, dissolved	7440-46-2	E421	0.00001	mg/L	0.05 mg/L	98.4	80.0	120	----
Chromium, dissolved	7440-47-3	E421	0.0005	mg/L	0.25 mg/L	105	80.0	120	----
Cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	0.25 mg/L	104	80.0	120	----
Copper, dissolved	7440-50-8	E421	0.0002	mg/L	0.25 mg/L	99.0	80.0	120	----
Iron, dissolved	7439-89-6	E421	0.01	mg/L	1 mg/L	116	80.0	120	----
Lead, dissolved	7439-92-1	E421	0.00005	mg/L	0.5 mg/L	97.6	80.0	120	----
Lithium, dissolved	7439-93-2	E421	0.001	mg/L	0.25 mg/L	108	80.0	120	----
Magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	108	80.0	120	----
Manganese, dissolved	7439-96-5	E421	0.0001	mg/L	0.25 mg/L	104	80.0	120	----
Molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	0.25 mg/L	102	80.0	120	----
Nickel, dissolved	7440-02-0	E421	0.0005	mg/L	0.5 mg/L	102	80.0	120	----
Phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	10 mg/L	109	70.0	130	----
Potassium, dissolved	7440-09-7	E421	0.05	mg/L	50 mg/L	102	80.0	120	----
Rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	0.1 mg/L	106	80.0	120	----

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Dissolved Metals (QCLot: 998152) - continued									
Selenium, dissolved	7782-49-2	E421	0.00005	mg/L	1 mg/L	96.7	80.0	120	----
Silicon, dissolved	7440-21-3	E421	0.05	mg/L	10 mg/L	103	60.0	140	----
Silver, dissolved	7440-22-4	E421	0.00001	mg/L	0.1 mg/L	93.2	80.0	120	----
Sodium, dissolved	7440-23-5	E421	0.05	mg/L	50 mg/L	105	80.0	120	----
Strontium, dissolved	7440-24-6	E421	0.0002	mg/L	0.25 mg/L	103	80.0	120	----
Sulfur, dissolved	7704-34-9	E421	0.5	mg/L	50 mg/L	102	80.0	120	----
Tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	0.1 mg/L	95.2	80.0	120	----
Thallium, dissolved	7440-28-0	E421	0.00001	mg/L	1 mg/L	97.8	80.0	120	----
Thorium, dissolved	7440-29-1	E421	0.0001	mg/L	0.1 mg/L	101	80.0	120	----
Tin, dissolved	7440-31-5	E421	0.0001	mg/L	0.5 mg/L	100	80.0	120	----
Titanium, dissolved	7440-32-6	E421	0.0003	mg/L	0.25 mg/L	98.8	80.0	120	----
Tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	0.1 mg/L	98.3	80.0	120	----
Uranium, dissolved	7440-61-1	E421	0.00001	mg/L	0.005 mg/L	98.5	80.0	120	----
Vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	0.5 mg/L	104	80.0	120	----
Zinc, dissolved	7440-66-6	E421	0.001	mg/L	0.5 mg/L	101	80.0	120	----
Zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	0.1 mg/L	98.8	80.0	120	----
Dissolved Metals (QCLot: 998153)									
Aluminum, dissolved	7429-90-5	E421	0.001	mg/L	2 mg/L	101	80.0	120	----
Antimony, dissolved	7440-36-0	E421	0.0001	mg/L	1 mg/L	102	80.0	120	----
Arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	1 mg/L	101	80.0	120	----
Barium, dissolved	7440-39-3	E421	0.0001	mg/L	0.25 mg/L	97.5	80.0	120	----
Beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	0.1 mg/L	100	80.0	120	----
Bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	1 mg/L	95.8	80.0	120	----
Boron, dissolved	7440-42-8	E421	0.01	mg/L	1 mg/L	102	80.0	120	----
Cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	0.1 mg/L	99.3	80.0	120	----
Calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	94.8	80.0	120	----
Cesium, dissolved	7440-46-2	E421	0.00001	mg/L	0.05 mg/L	98.6	80.0	120	----
Chromium, dissolved	7440-47-3	E421	0.0005	mg/L	0.25 mg/L	102	80.0	120	----
Cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	0.25 mg/L	99.2	80.0	120	----
Copper, dissolved	7440-50-8	E421	0.0002	mg/L	0.25 mg/L	94.0	80.0	120	----
Iron, dissolved	7439-89-6	E421	0.01	mg/L	1 mg/L	116	80.0	120	----
Lead, dissolved	7439-92-1	E421	0.00005	mg/L	0.5 mg/L	95.8	80.0	120	----
Lithium, dissolved	7439-93-2	E421	0.001	mg/L	0.25 mg/L	106	80.0	120	----
Magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	103	80.0	120	----
Manganese, dissolved	7439-96-5	E421	0.0001	mg/L	0.25 mg/L	98.1	80.0	120	----
Molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	0.25 mg/L	99.6	80.0	120	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report: Spike Concentration	Recovery (%) LCS	Recovery Limits (%) Low	Recovery Limits (%) High	Qualifier
Dissolved Metals (QCLot: 998153) - continued									
Nickel, dissolved	7440-02-0	E421	0.0005	mg/L	0.5 mg/L	98.1	80.0	120	----
Phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	10 mg/L	108	70.0	130	----
Potassium, dissolved	7440-09-7	E421	0.05	mg/L	50 mg/L	99.3	80.0	120	----
Rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	0.1 mg/L	106	80.0	120	----
Selenium, dissolved	7782-49-2	E421	0.00005	mg/L	1 mg/L	95.1	80.0	120	----
Silicon, dissolved	7440-21-3	E421	0.05	mg/L	10 mg/L	101	60.0	140	----
Silver, dissolved	7440-22-4	E421	0.00001	mg/L	0.1 mg/L	90.9	80.0	120	----
Sodium, dissolved	7440-23-5	E421	0.05	mg/L	50 mg/L	98.0	80.0	120	----
Strontium, dissolved	7440-24-6	E421	0.0002	mg/L	0.25 mg/L	102	80.0	120	----
Sulfur, dissolved	7704-34-9	E421	0.5	mg/L	50 mg/L	102	80.0	120	----
Tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	0.1 mg/L	95.7	80.0	120	----
Thallium, dissolved	7440-28-0	E421	0.00001	mg/L	1 mg/L	96.7	80.0	120	----
Thorium, dissolved	7440-29-1	E421	0.0001	mg/L	0.1 mg/L	98.8	80.0	120	----
Tin, dissolved	7440-31-5	E421	0.0001	mg/L	0.5 mg/L	97.4	80.0	120	----
Titanium, dissolved	7440-32-6	E421	0.0003	mg/L	0.25 mg/L	91.0	80.0	120	----
Tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	0.1 mg/L	95.5	80.0	120	----
Uranium, dissolved	7440-61-1	E421	0.00001	mg/L	0.005 mg/L	95.2	80.0	120	----
Vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	0.5 mg/L	100	80.0	120	----
Zinc, dissolved	7440-66-6	E421	0.001	mg/L	0.5 mg/L	96.2	80.0	120	----
Zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	0.1 mg/L	97.8	80.0	120	----
Dissolved Metals (QCLot: 998154)									
Aluminum, dissolved	7429-90-5	E421	0.001	mg/L	2 mg/L	101	80.0	120	----
Antimony, dissolved	7440-36-0	E421	0.0001	mg/L	1 mg/L	96.8	80.0	120	----
Arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	1 mg/L	99.9	80.0	120	----
Barium, dissolved	7440-39-3	E421	0.0001	mg/L	0.25 mg/L	94.5	80.0	120	----
Beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	0.1 mg/L	93.6	80.0	120	----
Bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	1 mg/L	94.2	80.0	120	----
Boron, dissolved	7440-42-8	E421	0.01	mg/L	1 mg/L	83.4	80.0	120	----
Cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	0.1 mg/L	96.2	80.0	120	----
Calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	93.3	80.0	120	----
Cesium, dissolved	7440-46-2	E421	0.00001	mg/L	0.05 mg/L	94.9	80.0	120	----
Chromium, dissolved	7440-47-3	E421	0.0005	mg/L	0.25 mg/L	98.7	80.0	120	----
Cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	0.25 mg/L	98.3	80.0	120	----
Copper, dissolved	7440-50-8	E421	0.0002	mg/L	0.25 mg/L	94.0	80.0	120	----
Iron, dissolved	7439-89-6	E421	0.01	mg/L	1 mg/L	114	80.0	120	----
Lead, dissolved	7439-92-1	E421	0.00005	mg/L	0.5 mg/L	94.6	80.0	120	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report: Spike Concentration	Recovery (%) LCS	Recovery Limits (%) Low	Recovery Limits (%) High	Qualifier
Dissolved Metals (QCLot: 998154) - continued									
Lithium, dissolved	7439-93-2	E421	0.001	mg/L	0.25 mg/L	99.4	80.0	120	----
Magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	102	80.0	120	----
Manganese, dissolved	7439-96-5	E421	0.0001	mg/L	0.25 mg/L	97.7	80.0	120	----
Molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	0.25 mg/L	95.8	80.0	120	----
Nickel, dissolved	7440-02-0	E421	0.0005	mg/L	0.5 mg/L	97.4	80.0	120	----
Phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	10 mg/L	99.5	70.0	130	----
Potassium, dissolved	7440-09-7	E421	0.05	mg/L	50 mg/L	99.5	80.0	120	----
Rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	0.1 mg/L	104	80.0	120	----
Selenium, dissolved	7782-49-2	E421	0.00005	mg/L	1 mg/L	93.9	80.0	120	----
Silicon, dissolved	7440-21-3	E421	0.05	mg/L	10 mg/L	97.9	60.0	140	----
Silver, dissolved	7440-22-4	E421	0.00001	mg/L	0.1 mg/L	87.4	80.0	120	----
Sodium, dissolved	7440-23-5	E421	0.05	mg/L	50 mg/L	99.3	80.0	120	----
Strontium, dissolved	7440-24-6	E421	0.0002	mg/L	0.25 mg/L	99.5	80.0	120	----
Sulfur, dissolved	7704-34-9	E421	0.5	mg/L	50 mg/L	89.7	80.0	120	----
Tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	0.1 mg/L	90.6	80.0	120	----
Thallium, dissolved	7440-28-0	E421	0.00001	mg/L	1 mg/L	94.8	80.0	120	----
Thorium, dissolved	7440-29-1	E421	0.0001	mg/L	0.1 mg/L	94.8	80.0	120	----
Tin, dissolved	7440-31-5	E421	0.0001	mg/L	0.5 mg/L	94.7	80.0	120	----
Titanium, dissolved	7440-32-6	E421	0.0003	mg/L	0.25 mg/L	98.0	80.0	120	----
Tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	0.1 mg/L	91.6	80.0	120	----
Uranium, dissolved	7440-61-1	E421	0.00001	mg/L	0.005 mg/L	91.8	80.0	120	----
Vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	0.5 mg/L	99.4	80.0	120	----
Zinc, dissolved	7440-66-6	E421	0.001	mg/L	0.5 mg/L	94.0	80.0	120	----
Zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	0.1 mg/L	93.3	80.0	120	----
Aggregate Organics (QCLot: 1000147)									
Phenols, total (4AAP)	----	E562	0.001	mg/L	0.02 mg/L	107	85.0	115	----
Aggregate Organics (QCLot: 1000152)									
Phenols, total (4AAP)	----	E562	0.001	mg/L	0.02 mg/L	110	85.0	115	----
Aggregate Organics (QCLot: 1003714)									
Phenols, total (4AAP)	----	E562	0.001	mg/L	0.02 mg/L	108	85.0	115	----
Volatile Organic Compounds (QCLot: 1000805)									
Benzene	71-43-2	E611E	0.5	µg/L	100 µg/L	89.1	70.0	130	----
Bromobenzene	108-86-1	E611E	1	µg/L	100 µg/L	85.3	70.0	130	----
Bromochloromethane	74-97-5	E611E	1	µg/L	100 µg/L	84.2	70.0	130	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report: Spike Concentration	Recovery (%) LCS	Recovery Limits (%) Low	Recovery Limits (%) High	Qualifier
Volatile Organic Compounds (QCLot: 1000805) - continued									
Bromodichloromethane	75-27-4	E611E	1	µg/L	100 µg/L	89.2	70.0	130	----
Bromoform	75-25-2	E611E	1	µg/L	100 µg/L	84.7	70.0	130	----
Bromomethane	74-83-9	E611E	1	µg/L	100 µg/L	95.2	60.0	140	----
Butylbenzene, n-	104-51-8	E611E	1	µg/L	100 µg/L	91.8	70.0	130	----
Butylbenzene, sec-	135-98-8	E611E	1	µg/L	100 µg/L	91.6	70.0	130	----
Butylbenzene, tert-	98-06-6	E611E	1	µg/L	100 µg/L	84.3	70.0	130	----
Carbon tetrachloride	56-23-5	E611E	0.5	µg/L	100 µg/L	92.4	70.0	130	----
Chlorobenzene	108-90-7	E611E	1	µg/L	100 µg/L	109	70.0	130	----
Chloroethane	75-00-3	E611E	1	µg/L	100 µg/L	90.4	60.0	140	----
Chloroform	67-66-3	E611E	1	µg/L	100 µg/L	86.9	70.0	130	----
Chloromethane	74-87-3	E611E	5	µg/L	100 µg/L	96.6	60.0	140	----
Chlorotoluene, 2-	95-49-8	E611E	1	µg/L	100 µg/L	81.7	70.0	130	----
Chlorotoluene, 4-	106-43-4	E611E	1	µg/L	100 µg/L	81.5	70.0	130	----
Cymene, p-	99-87-6	E611E	1	µg/L	100 µg/L	85.3	70.0	130	----
Dibromo-3-chloropropane, 1,2-	96-12-8	E611E	1	µg/L	100 µg/L	96.6	70.0	130	----
Dibromochloromethane	124-48-1	E611E	1	µg/L	100 µg/L	114	70.0	130	----
Dibromoethane, 1,2-	106-93-4	E611E	1	µg/L	100 µg/L	98.8	70.0	130	----
Dibromomethane	74-95-3	E611E	1	µg/L	100 µg/L	81.1	70.0	130	----
Dichlorobenzene, 1,2-	95-50-1	E611E	0.5	µg/L	100 µg/L	99.2	70.0	130	----
Dichlorobenzene, 1,3-	541-73-1	E611E	1	µg/L	100 µg/L	99.1	70.0	130	----
Dichlorobenzene, 1,4-	106-46-7	E611E	1	µg/L	100 µg/L	104	70.0	130	----
Dichlorodifluoromethane	75-71-8	E611E	1	µg/L	100 µg/L	110	60.0	140	----
Dichloroethane, 1,1-	75-34-3	E611E	1	µg/L	100 µg/L	92.5	70.0	130	----
Dichloroethane, 1,2-	107-06-2	E611E	1	µg/L	100 µg/L	80.6	70.0	130	----
Dichloroethylene, 1,1-	75-35-4	E611E	1	µg/L	100 µg/L	83.2	70.0	130	----
Dichloroethylene, cis-1,2-	156-59-2	E611E	1	µg/L	100 µg/L	81.6	70.0	130	----
Dichloroethylene, trans-1,2-	156-60-5	E611E	1	µg/L	100 µg/L	91.0	70.0	130	----
Dichloromethane	75-09-2	E611E	1	µg/L	100 µg/L	82.7	70.0	130	----
Dichloropropane, 1,2-	78-87-5	E611E	1	µg/L	100 µg/L	85.0	70.0	130	----
Dichloropropane, 1,3-	142-28-9	E611E	1	µg/L	100 µg/L	94.3	70.0	130	----
Dichloropropane, 2,2-	594-20-7	E611E	1	µg/L	100 µg/L	80.0	70.0	130	----
Dichloropropylene, 1,1-	563-58-6	E611E	1	µg/L	100 µg/L	85.0	70.0	130	----
Dichloropropylene, cis-1,3-	10061-01-5	E611E	1	µg/L	100 µg/L	89.1	70.0	130	----
Dichloropropylene, trans-1,3-	10061-02-6	E611E	1	µg/L	100 µg/L	90.1	70.0	130	----
Ethylbenzene	100-41-4	E611E	0.5	µg/L	100 µg/L	109	70.0	130	----
Hexachlorobutadiene	87-68-3	E611E	1	µg/L	100 µg/L	102	70.0	130	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
					Concentration	LCS	Low	High	Qualifier
Volatile Organic Compounds (QCLot: 1000805) - continued									
Isopropylbenzene	98-82-8	E611E	1	µg/L	100 µg/L	130	70.0	130	----
Methyl-tert-butyl ether [MTBE]	1634-04-4	E611E	0.5	µg/L	100 µg/L	105	70.0	130	----
Propylbenzene, n-	103-65-1	E611E	1	µg/L	100 µg/L	127	70.0	130	----
Styrene	100-42-5	E611E	0.5	µg/L	100 µg/L	123	70.0	130	----
Tetrachloroethane, 1,1,1,2-	630-20-6	E611E	1	µg/L	100 µg/L	111	70.0	130	----
Tetrachloroethane, 1,1,2,2-	79-34-5	E611E	1	µg/L	100 µg/L	91.6	70.0	130	----
Tetrachloroethylene	127-18-4	E611E	1	µg/L	100 µg/L	109	70.0	130	----
Toluene	108-88-3	E611E	0.5	µg/L	100 µg/L	96.6	70.0	130	----
Trichlorobenzene, 1,2,3-	87-61-6	E611E	1	µg/L	100 µg/L	125	70.0	130	----
Trichlorobenzene, 1,2,4-	120-82-1	E611E	1	µg/L	100 µg/L	109	70.0	130	----
Trichloroethane, 1,1,1-	71-55-6	E611E	1	µg/L	100 µg/L	88.1	70.0	130	----
Trichloroethane, 1,1,2-	79-00-5	E611E	1	µg/L	100 µg/L	104	70.0	130	----
Trichloroethylene	79-01-6	E611E	1	µg/L	100 µg/L	92.4	70.0	130	----
Trichlorofluoromethane	75-69-4	E611E	1	µg/L	100 µg/L	93.4	60.0	140	----
Trichloropropane, 1,2,3-	96-18-4	E611E	1	µg/L	100 µg/L	85.4	70.0	130	----
Trimethylbenzene, 1,2,4-	95-63-6	E611E	1	µg/L	100 µg/L	92.2	70.0	130	----
Trimethylbenzene, 1,3,5-	108-67-8	E611E	1	µg/L	100 µg/L	87.6	70.0	130	----
Vinyl chloride	75-01-4	E611E	1	µg/L	100 µg/L	106	60.0	140	----
Xylene, m+p-	179601-23-1	E611E	0.4	µg/L	200 µg/L	111	70.0	130	----
Xylene, o-	95-47-6	E611E	0.3	µg/L	100 µg/L	114	70.0	130	----
Volatile Organic Compounds (QCLot: 1000806)									
Benzene	71-43-2	E611A	0.5	µg/L	100 µg/L	89.1	70.0	130	----
Ethylbenzene	100-41-4	E611A	0.5	µg/L	100 µg/L	109	70.0	130	----
Styrene	100-42-5	E611A	0.5	µg/L	100 µg/L	123	70.0	130	----
Toluene	108-88-3	E611A	0.5	µg/L	100 µg/L	96.6	70.0	130	----
Xylene, m+p-	179601-23-1	E611A	0.4	µg/L	200 µg/L	111	70.0	130	----
Xylene, o-	95-47-6	E611A	0.3	µg/L	100 µg/L	114	70.0	130	----
Volatile Organic Compounds (QCLot: 996595)									
Benzene	71-43-2	E611A	0.5	µg/L	100 µg/L	116	70.0	130	----
Ethylbenzene	100-41-4	E611A	0.5	µg/L	100 µg/L	96.4	70.0	130	----
Styrene	100-42-5	E611A	0.5	µg/L	100 µg/L	92.5	70.0	130	----
Toluene	108-88-3	E611A	0.5	µg/L	100 µg/L	94.8	70.0	130	----
Xylene, m+p-	179601-23-1	E611A	0.4	µg/L	200 µg/L	107	70.0	130	----
Xylene, o-	95-47-6	E611A	0.3	µg/L	100 µg/L	85.9	70.0	130	----
Volatile Organic Compounds (QCLot: 996596)									
Benzene	71-43-2	E611E	0.5	µg/L	100 µg/L	116	70.0	130	----

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Volatile Organic Compounds (QCLot: 996596) - continued									
Bromobenzene	108-86-1	E611E	1	µg/L	100 µg/L	101	70.0	130	----
Bromochloromethane	74-97-5	E611E	1	µg/L	100 µg/L	124	70.0	130	----
Bromodichloromethane	75-27-4	E611E	1	µg/L	100 µg/L	109	70.0	130	----
Bromoform	75-25-2	E611E	1	µg/L	100 µg/L	110	70.0	130	----
Bromomethane	74-83-9	E611E	1	µg/L	100 µg/L	93.4	60.0	140	----
Butylbenzene, n-	104-51-8	E611E	1	µg/L	100 µg/L	105	70.0	130	----
Butylbenzene, sec-	135-98-8	E611E	1	µg/L	100 µg/L	119	70.0	130	----
Butylbenzene, tert-	98-06-6	E611E	1	µg/L	100 µg/L	114	70.0	130	----
Carbon tetrachloride	56-23-5	E611E	0.5	µg/L	100 µg/L	105	70.0	130	----
Chlorobenzene	108-90-7	E611E	1	µg/L	100 µg/L	94.8	70.0	130	----
Chloroethane	75-00-3	E611E	1	µg/L	100 µg/L	95.7	60.0	140	----
Chloroform	67-66-3	E611E	1	µg/L	100 µg/L	115	70.0	130	----
Chloromethane	74-87-3	E611E	5	µg/L	100 µg/L	86.3	60.0	140	----
Chlorotoluene, 2-	95-49-8	E611E	1	µg/L	100 µg/L	108	70.0	130	----
Chlorotoluene, 4-	106-43-4	E611E	1	µg/L	100 µg/L	110	70.0	130	----
Cymene, p-	99-87-6	E611E	1	µg/L	100 µg/L	105	70.0	130	----
Dibromo-3-chloropropane, 1,2-	96-12-8	E611E	1	µg/L	100 µg/L	94.0	70.0	130	----
Dibromochloromethane	124-48-1	E611E	1	µg/L	100 µg/L	121	70.0	130	----
Dibromoethane, 1,2-	106-93-4	E611E	1	µg/L	100 µg/L	80.0	70.0	130	----
Dibromomethane	74-95-3	E611E	1	µg/L	100 µg/L	106	70.0	130	----
Dichlorobenzene, 1,2-	95-50-1	E611E	0.5	µg/L	100 µg/L	94.6	70.0	130	----
Dichlorobenzene, 1,3-	541-73-1	E611E	1	µg/L	100 µg/L	96.6	70.0	130	----
Dichlorobenzene, 1,4-	106-46-7	E611E	1	µg/L	100 µg/L	113	70.0	130	----
Dichlorodifluoromethane	75-71-8	E611E	1	µg/L	100 µg/L	122	60.0	140	----
Dichloroethane, 1,1-	75-34-3	E611E	1	µg/L	100 µg/L	112	70.0	130	----
Dichloroethane, 1,2-	107-06-2	E611E	1	µg/L	100 µg/L	108	70.0	130	----
Dichloroethylene, 1,1-	75-35-4	E611E	1	µg/L	100 µg/L	113	70.0	130	----
Dichloroethylene, cis-1,2-	156-59-2	E611E	1	µg/L	100 µg/L	98.1	70.0	130	----
Dichloroethylene, trans-1,2-	156-60-5	E611E	1	µg/L	100 µg/L	115	70.0	130	----
Dichloromethane	75-09-2	E611E	1	µg/L	100 µg/L	112	70.0	130	----
Dichloropropane, 1,2-	78-87-5	E611E	1	µg/L	100 µg/L	92.6	70.0	130	----
Dichloropropane, 1,3-	142-28-9	E611E	1	µg/L	100 µg/L	87.8	70.0	130	----
Dichloropropane, 2,2-	594-20-7	E611E	1	µg/L	100 µg/L	94.8	70.0	130	----
Dichloropropylene, 1,1-	563-58-6	E611E	1	µg/L	100 µg/L	85.6	70.0	130	----
Dichloropropylene, cis-1,3-	10061-01-5	E611E	1	µg/L	100 µg/L	96.9	70.0	130	----
Dichloropropylene, trans-1,3-	10061-02-6	E611E	1	µg/L	100 µg/L	93.9	70.0	130	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
					Concentration	LCS	Low	High	Qualifier
Volatile Organic Compounds (QCLot: 996596) - continued									
Ethylbenzene	100-41-4	E611E	0.5	µg/L	100 µg/L	96.4	70.0	130	----
Hexachlorobutadiene	87-68-3	E611E	1	µg/L	100 µg/L	85.1	70.0	130	----
Isopropylbenzene	98-82-8	E611E	1	µg/L	100 µg/L	116	70.0	130	----
Methyl-tert-butyl ether [MTBE]	1634-04-4	E611E	0.5	µg/L	100 µg/L	102	70.0	130	----
Propylbenzene, n-	103-65-1	E611E	1	µg/L	100 µg/L	111	70.0	130	----
Styrene	100-42-5	E611E	0.5	µg/L	100 µg/L	92.5	70.0	130	----
Tetrachloroethane, 1,1,1,2-	630-20-6	E611E	1	µg/L	100 µg/L	103	70.0	130	----
Tetrachloroethane, 1,1,2,2-	79-34-5	E611E	1	µg/L	100 µg/L	98.9	70.0	130	----
Tetrachloroethylene	127-18-4	E611E	1	µg/L	100 µg/L	106	70.0	130	----
Toluene	108-88-3	E611E	0.5	µg/L	100 µg/L	94.8	70.0	130	----
Trichlorobenzene, 1,2,3-	87-61-6	E611E	1	µg/L	100 µg/L	117	70.0	130	----
Trichlorobenzene, 1,2,4-	120-82-1	E611E	1	µg/L	100 µg/L	114	70.0	130	----
Trichloroethane, 1,1,1-	71-55-6	E611E	1	µg/L	100 µg/L	90.9	70.0	130	----
Trichloroethane, 1,1,2-	79-00-5	E611E	1	µg/L	100 µg/L	95.6	70.0	130	----
Trichloroethylene	79-01-6	E611E	1	µg/L	100 µg/L	106	70.0	130	----
Trichlorofluoromethane	75-69-4	E611E	1	µg/L	100 µg/L	91.8	60.0	140	----
Trichloropropane, 1,2,3-	96-18-4	E611E	1	µg/L	100 µg/L	100	70.0	130	----
Trimethylbenzene, 1,2,4-	95-63-6	E611E	1	µg/L	100 µg/L	114	70.0	130	----
Trimethylbenzene, 1,3,5-	108-67-8	E611E	1	µg/L	100 µg/L	99.5	70.0	130	----
Vinyl chloride	75-01-4	E611E	1	µg/L	100 µg/L	84.0	60.0	140	----
Xylene, m+p-	179601-23-1	E611E	0.4	µg/L	200 µg/L	107	70.0	130	----
Xylene, o-	95-47-6	E611E	0.3	µg/L	100 µg/L	85.9	70.0	130	----
Volatile Organic Compounds (QCLot: 998108)									
Benzene	71-43-2	E611E	0.5	µg/L	100 µg/L	105	70.0	130	----
Bromobenzene	108-86-1	E611E	1	µg/L	100 µg/L	106	70.0	130	----
Bromochloromethane	74-97-5	E611E	1	µg/L	100 µg/L	126	70.0	130	----
Bromodichloromethane	75-27-4	E611E	1	µg/L	100 µg/L	102	70.0	130	----
Bromoform	75-25-2	E611E	1	µg/L	100 µg/L	99.7	70.0	130	----
Bromomethane	74-83-9	E611E	1	µg/L	100 µg/L	134	60.0	140	----
Butylbenzene, n-	104-51-8	E611E	1	µg/L	100 µg/L	118	70.0	130	----
Butylbenzene, sec-	135-98-8	E611E	1	µg/L	100 µg/L	105	70.0	130	----
Butylbenzene, tert-	98-06-6	E611E	1	µg/L	100 µg/L	105	70.0	130	----
Carbon tetrachloride	56-23-5	E611E	0.5	µg/L	100 µg/L	121	70.0	130	----
Chlorobenzene	108-90-7	E611E	1	µg/L	100 µg/L	101	70.0	130	----
Chloroethane	75-00-3	E611E	1	µg/L	100 µg/L	118	60.0	140	----
Chloroform	67-66-3	E611E	1	µg/L	100 µg/L	110	70.0	130	----

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Volatile Organic Compounds (QCLot: 998108) - continued									
Chloromethane	74-87-3	E611E	5	µg/L	100 µg/L	117	60.0	140	----
Chlorotoluene, 2-	95-49-8	E611E	1	µg/L	100 µg/L	109	70.0	130	----
Chlorotoluene, 4-	106-43-4	E611E	1	µg/L	100 µg/L	118	70.0	130	----
Cymene, p-	99-87-6	E611E	1	µg/L	100 µg/L	119	70.0	130	----
Dibromo-3-chloropropane, 1,2-	96-12-8	E611E	1	µg/L	100 µg/L	106	70.0	130	----
Dibromochloromethane	124-48-1	E611E	1	µg/L	100 µg/L	109	70.0	130	----
Dibromoethane, 1,2-	106-93-4	E611E	1	µg/L	100 µg/L	86.2	70.0	130	----
Dibromomethane	74-95-3	E611E	1	µg/L	100 µg/L	86.3	70.0	130	----
Dichlorobenzene, 1,2-	95-50-1	E611E	0.5	µg/L	100 µg/L	108	70.0	130	----
Dichlorobenzene, 1,3-	541-73-1	E611E	1	µg/L	100 µg/L	108	70.0	130	----
Dichlorobenzene, 1,4-	106-46-7	E611E	1	µg/L	100 µg/L	116	70.0	130	----
Dichlorodifluoromethane	75-71-8	E611E	1	µg/L	100 µg/L	98.6	60.0	140	----
Dichloroethane, 1,1-	75-34-3	E611E	1	µg/L	100 µg/L	111	70.0	130	----
Dichloroethane, 1,2-	107-06-2	E611E	1	µg/L	100 µg/L	103	70.0	130	----
Dichloroethylene, 1,1-	75-35-4	E611E	1	µg/L	100 µg/L	119	70.0	130	----
Dichloroethylene, cis-1,2-	156-59-2	E611E	1	µg/L	100 µg/L	98.2	70.0	130	----
Dichloroethylene, trans-1,2-	156-60-5	E611E	1	µg/L	100 µg/L	114	70.0	130	----
Dichloromethane	75-09-2	E611E	1	µg/L	100 µg/L	118	70.0	130	----
Dichloropropane, 1,2-	78-87-5	E611E	1	µg/L	100 µg/L	91.2	70.0	130	----
Dichloropropane, 1,3-	142-28-9	E611E	1	µg/L	100 µg/L	92.6	70.0	130	----
Dichloropropane, 2,2-	594-20-7	E611E	1	µg/L	100 µg/L	94.7	70.0	130	----
Dichloropropylene, 1,1-	563-58-6	E611E	1	µg/L	100 µg/L	102	70.0	130	----
Dichloropropylene, cis-1,3-	10061-01-5	E611E	1	µg/L	100 µg/L	77.9	70.0	130	----
Dichloropropylene, trans-1,3-	10061-02-6	E611E	1	µg/L	100 µg/L	95.7	70.0	130	----
Ethylbenzene	100-41-4	E611E	0.5	µg/L	100 µg/L	120	70.0	130	----
Hexachlorobutadiene	87-68-3	E611E	1	µg/L	100 µg/L	102	70.0	130	----
Isopropylbenzene	98-82-8	E611E	1	µg/L	100 µg/L	109	70.0	130	----
Methyl-tert-butyl ether [MTBE]	1634-04-4	E611E	0.5	µg/L	100 µg/L	106	70.0	130	----
Propylbenzene, n-	103-65-1	E611E	1	µg/L	100 µg/L	115	70.0	130	----
Styrene	100-42-5	E611E	0.5	µg/L	100 µg/L	107	70.0	130	----
Tetrachloroethane, 1,1,1,2-	630-20-6	E611E	1	µg/L	100 µg/L	116	70.0	130	----
Tetrachloroethane, 1,1,2,2-	79-34-5	E611E	1	µg/L	100 µg/L	104	70.0	130	----
Tetrachloroethylene	127-18-4	E611E	1	µg/L	100 µg/L	123	70.0	130	----
Toluene	108-88-3	E611E	0.5	µg/L	100 µg/L	117	70.0	130	----
Trichlorobenzene, 1,2,3-	87-61-6	E611E	1	µg/L	100 µg/L	119	70.0	130	----
Trichlorobenzene, 1,2,4-	120-82-1	E611E	1	µg/L	100 µg/L	114	70.0	130	----

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Volatile Organic Compounds (QCLot: 998108) - continued									
Trichloroethane, 1,1,1-	71-55-6	E611E	1	µg/L	100 µg/L	99.0	70.0	130	----
Trichloroethane, 1,1,2-	79-00-5	E611E	1	µg/L	100 µg/L	91.4	70.0	130	----
Trichloroethylene	79-01-6	E611E	1	µg/L	100 µg/L	112	70.0	130	----
Trichlorofluoromethane	75-69-4	E611E	1	µg/L	100 µg/L	110	60.0	140	----
Trichloropropane, 1,2,3-	96-18-4	E611E	1	µg/L	100 µg/L	104	70.0	130	----
Trimethylbenzene, 1,2,4-	95-63-6	E611E	1	µg/L	100 µg/L	108	70.0	130	----
Trimethylbenzene, 1,3,5-	108-67-8	E611E	1	µg/L	100 µg/L	126	70.0	130	----
Vinyl chloride	75-01-4	E611E	1	µg/L	100 µg/L	112	60.0	140	----
Xylene, m+p-	179601-23-1	E611E	0.4	µg/L	200 µg/L	111	70.0	130	----
Xylene, o-	95-47-6	E611E	0.3	µg/L	100 µg/L	104	70.0	130	----
Volatile Organic Compounds (QCLot: 998109)									
Benzene	71-43-2	E611A	0.5	µg/L	100 µg/L	105	70.0	130	----
Ethylbenzene	100-41-4	E611A	0.5	µg/L	100 µg/L	120	70.0	130	----
Styrene	100-42-5	E611A	0.5	µg/L	100 µg/L	107	70.0	130	----
Toluene	108-88-3	E611A	0.5	µg/L	100 µg/L	117	70.0	130	----
Xylene, m+p-	179601-23-1	E611A	0.4	µg/L	200 µg/L	111	70.0	130	----
Xylene, o-	95-47-6	E611A	0.3	µg/L	100 µg/L	104	70.0	130	----
Hydrocarbons (QCLot: 1000807)									
F1 (C6-C10)	----	E581.F1	100	µg/L	2750 µg/L	82.7	70.0	130	----
Hydrocarbons (QCLot: 996594)									
F1 (C6-C10)	----	E581.F1	100	µg/L	2750 µg/L	98.5	70.0	130	----
Hydrocarbons (QCLot: 997762)									
F2 (C10-C16)	----	E601	100	µg/L	3850 µg/L	112	70.0	130	----
Hydrocarbons (QCLot: 997770)									
F2 (C10-C16)	----	E601	100	µg/L	3850 µg/L	78.4	70.0	130	----
Hydrocarbons (QCLot: 998110)									
F1 (C6-C10)	----	E581.F1	100	µg/L	2750 µg/L	82.0	70.0	130	----
Hydrocarbons (QCLot: 998218)									
F2 (C10-C16)	----	E601	100	µg/L	3850 µg/L	92.1	70.0	130	----

Matrix Spike (MS) Report

A Matrix Spike (MS) is a randomly selected intra-laboratory replicate sample that has been fortified (spiked) with test analytes at known concentration, and processed in an identical manner to test samples. Matrix Spikes provide information regarding analyte recovery and potential matrix effects. MS DQO exceedances due to sample matrix may sometimes be unavoidable; in such cases, test results for the associated sample (or similar samples) may be subject to bias. ND – Recovery not determined, background level >= 1x spike level.

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Anions and Nutrients (QCLot: 1000106)										
EO2304968-002	MW-1C	Kjeldahl nitrogen, total [TKN]	----	E318	2.84 mg/L	2.5 mg/L	114	70.0	130	----
Anions and Nutrients (QCLot: 1000107)										
EO2304968-022	MW-26B	Kjeldahl nitrogen, total [TKN]	----	E318	2.88 mg/L	2.5 mg/L	115	70.0	130	----
Anions and Nutrients (QCLot: 1000108)										
EO2304968-043	DUP A	Kjeldahl nitrogen, total [TKN]	----	E318	1.92 mg/L	2.5 mg/L	77.0	70.0	130	----
Anions and Nutrients (QCLot: 1001127)										
EO2304968-048	FIELD BLANK	Ammonia, total (as N)	7664-41-7	E298	0.0962 mg/L	0.1 mg/L	96.2	75.0	125	----
Anions and Nutrients (QCLot: 1001471)										
EO2304945-006	Anonymous	Ammonia, total (as N)	7664-41-7	E298	0.103 mg/L	0.1 mg/L	103	75.0	125	----
Anions and Nutrients (QCLot: 1003447)										
EO2304968-033	MW-32A	Ammonia, total (as N)	7664-41-7	E298	ND mg/L	0.1 mg/L	ND	75.0	125	----
Anions and Nutrients (QCLot: 1003460)										
EO2304968-047	TRIP BLANK	Ammonia, total (as N)	7664-41-7	E298	0.0995 mg/L	0.1 mg/L	99.5	75.0	125	----
Anions and Nutrients (QCLot: 997148)										
EO2304968-002	MW-1C	Fluoride	16984-48-8	E235.F	0.905 mg/L	1 mg/L	90.5	75.0	125	----
Anions and Nutrients (QCLot: 997149)										
EO2304968-002	MW-1C	Nitrate (as N)	14797-55-8	E235.NO3	2.49 mg/L	2.5 mg/L	99.7	75.0	125	----
Anions and Nutrients (QCLot: 997150)										
EO2304968-002	MW-1C	Nitrite (as N)	14797-65-0	E235.NO2	0.492 mg/L	0.5 mg/L	98.5	75.0	125	----
Anions and Nutrients (QCLot: 997151)										
EO2304968-002	MW-1C	Chloride	16887-00-6	E235.Cl	99.2 mg/L	100 mg/L	99.2	75.0	125	----
Anions and Nutrients (QCLot: 997152)										
EO2304968-002	MW-1C	Sulfate (as SO4)	14808-79-8	E235.SO4	ND mg/L	100 mg/L	ND	75.0	125	----
Anions and Nutrients (QCLot: 997153)										
EO2304968-022	MW-26B	Sulfate (as SO4)	14808-79-8	E235.SO4	ND mg/L	100 mg/L	ND	75.0	125	----
Anions and Nutrients (QCLot: 997154)										
EO2304968-022	MW-26B	Nitrate (as N)	14797-55-8	E235.NO3	2.50 mg/L	2.5 mg/L	100	75.0	125	----

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Anions and Nutrients (QCLot: 997155)										
EO2304968-022	MW-26B	Nitrite (as N)	14797-65-0	E235.NO2	0.495 mg/L	0.5 mg/L	98.9	75.0	125	----
Anions and Nutrients (QCLot: 997156)										
EO2304968-022	MW-26B	Fluoride	16984-48-8	E235.F	0.848 mg/L	1 mg/L	84.8	75.0	125	----
Anions and Nutrients (QCLot: 997157)										
EO2304968-022	MW-26B	Chloride	16887-00-6	E235.Cl	99.0 mg/L	100 mg/L	99.0	75.0	125	----
Anions and Nutrients (QCLot: 997162)										
EO2304968-048	FIELD BLANK	Fluoride	16984-48-8	E235.F	0.930 mg/L	1 mg/L	93.0	75.0	125	----
Anions and Nutrients (QCLot: 997165)										
EO2304968-048	FIELD BLANK	Sulfate (as SO4)	14808-79-8	E235.SO4	92.0 mg/L	100 mg/L	92.0	75.0	125	----
Anions and Nutrients (QCLot: 997166)										
EO2304968-048	FIELD BLANK	Nitrate (as N)	14797-55-8	E235.NO3	2.32 mg/L	2.5 mg/L	92.9	75.0	125	----
Anions and Nutrients (QCLot: 997167)										
EO2304968-048	FIELD BLANK	Nitrite (as N)	14797-65-0	E235.NO2	0.462 mg/L	0.5 mg/L	92.5	75.0	125	----
Anions and Nutrients (QCLot: 997168)										
EO2304968-048	FIELD BLANK	Chloride	16887-00-6	E235.Cl	92.5 mg/L	100 mg/L	92.5	75.0	125	----
Organic / Inorganic Carbon (QCLot: 997116)										
EO2304968-001	MW-1B	Carbon, dissolved organic [DOC]	----	E358-L	ND mg/L	5 mg/L	ND	70.0	130	----
Organic / Inorganic Carbon (QCLot: 997117)										
EO2304968-021	MW-26A	Carbon, dissolved organic [DOC]	----	E358-L	ND mg/L	5 mg/L	ND	70.0	130	----
Organic / Inorganic Carbon (QCLot: 997118)										
EO2304968-042	MW-36A	Carbon, dissolved organic [DOC]	----	E358-L	ND mg/L	5 mg/L	ND	70.0	130	----
Total Metals (QCLot: 1004768)										
CG2308076-002	Anonymous	Mercury, total	7439-97-6	E508	0.0000780 mg/L	0.0001 mg/L	78.0	70.0	130	----
Total Metals (QCLot: 998151)										
EO2304968-038	MW-35A	Aluminum, total	7429-90-5	E420	ND mg/L	2 mg/L	ND	70.0	130	----
		Antimony, total	7440-36-0	E420	0.202 mg/L	0.2 mg/L	101	70.0	130	----
		Arsenic, total	7440-38-2	E420	0.205 mg/L	0.2 mg/L	102	70.0	130	----
		Barium, total	7440-39-3	E420	ND mg/L	0.2 mg/L	ND	70.0	130	----
		Beryllium, total	7440-41-7	E420	0.430 mg/L	0.4 mg/L	108	70.0	130	----
		Bismuth, total	7440-69-9	E420	0.0944 mg/L	0.1 mg/L	94.4	70.0	130	----
		Boron, total	7440-42-8	E420	1.02 mg/L	1 mg/L	102	70.0	130	----

Sub-Matrix: **Water**

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Matrix Spike (MS) Report: Spike Concentration	Spike Target	Recovery (%) MS	Recovery Limits (%) Low	Recovery Limits (%) High	Qualifier
Total Metals (QCLot: 998151) - continued										
EO2304968-038	MW-35A	Cadmium, total	7440-43-9	E420	0.0398 mg/L	0.04 mg/L	99.6	70.0	130	----
		Calcium, total	7440-70-2	E420	38.4 mg/L	40 mg/L	96.1	70.0	130	----
		Cesium, total	7440-46-2	E420	0.105 mg/L	0.1 mg/L	105	70.0	130	----
		Chromium, total	7440-47-3	E420	0.420 mg/L	0.4 mg/L	105	70.0	130	----
		Cobalt, total	7440-48-4	E420	0.204 mg/L	0.2 mg/L	102	70.0	130	----
		Copper, total	7440-50-8	E420	0.194 mg/L	0.2 mg/L	97.2	70.0	130	----
		Iron, total	7439-89-6	E420	ND mg/L	20 mg/L	ND	70.0	130	----
		Lead, total	7439-92-1	E420	0.191 mg/L	0.2 mg/L	95.6	70.0	130	----
		Lithium, total	7439-93-2	E420	1.04 mg/L	1 mg/L	104	70.0	130	----
		Magnesium, total	7439-95-4	E420	10.9 mg/L	10 mg/L	109	70.0	130	----
		Manganese, total	7439-96-5	E420	ND mg/L	0.2 mg/L	ND	70.0	130	----
		Molybdenum, total	7439-98-7	E420	0.206 mg/L	0.2 mg/L	103	70.0	130	----
		Nickel, total	7440-02-0	E420	0.406 mg/L	0.4 mg/L	102	70.0	130	----
		Phosphorus, total	7723-14-0	E420	108 mg/L	100 mg/L	108	70.0	130	----
		Potassium, total	7440-09-7	E420	43.8 mg/L	40 mg/L	109	70.0	130	----
		Rubidium, total	7440-17-7	E420	0.199 mg/L	0.2 mg/L	99.4	70.0	130	----
		Selenium, total	7782-49-2	E420	0.402 mg/L	0.4 mg/L	100	70.0	130	----
		Silicon, total	7440-21-3	E420	107 mg/L	100 mg/L	107	70.0	130	----
		Silver, total	7440-22-4	E420	0.0417 mg/L	0.04 mg/L	104	70.0	130	----
		Sodium, total	7440-23-5	E420	ND mg/L	20 mg/L	ND	70.0	130	----
		Strontium, total	7440-24-6	E420	ND mg/L	0.2 mg/L	ND	70.0	130	----
		Sulfur, total	7704-34-9	E420	225 mg/L	200 mg/L	112	70.0	130	----
		Tellurium, total	13494-80-9	E420	0.390 mg/L	0.4 mg/L	97.6	70.0	130	----
		Thallium, total	7440-28-0	E420	0.0371 mg/L	0.04 mg/L	92.8	70.0	130	----
		Thorium, total	7440-29-1	E420	0.199 mg/L	0.2 mg/L	99.5	70.0	130	----
		Tin, total	7440-31-5	E420	0.194 mg/L	0.2 mg/L	97.0	70.0	130	----
		Titanium, total	7440-32-6	E420	0.418 mg/L	0.4 mg/L	104	70.0	130	----
		Tungsten, total	7440-33-7	E420	0.199 mg/L	0.2 mg/L	99.4	70.0	130	----
		Uranium, total	7440-61-1	E420	0.0398 mg/L	0.04 mg/L	99.6	70.0	130	----
		Vanadium, total	7440-62-2	E420	1.06 mg/L	1 mg/L	106	70.0	130	----
		Zinc, total	7440-66-6	E420	3.97 mg/L	4 mg/L	99.3	70.0	130	----
		Zirconium, total	7440-67-7	E420	0.406 mg/L	0.4 mg/L	102	70.0	130	----
Dissolved Metals (QCLot: 996670)										
EO2304968-002	MW-1C	Mercury, dissolved	7439-97-6	E509	0.0000967 mg/L	0.0001 mg/L	96.7	70.0	130	----
Dissolved Metals (QCLot: 996671)										

Sub-Matrix: **Water**

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Matrix Spike (MS) Report: Spike Concentration	Spike Target	Recovery (%) MS	Recovery Limits (%) Low	Recovery Limits (%) High	Qualifier
Dissolved Metals (QCLot: 996671) - continued										
EO2304968-022	MW-26B	Mercury, dissolved	7439-97-6	E509	0.0000904 mg/L	0.0001 mg/L	90.4	70.0	130	----
Dissolved Metals (QCLot: 996672)										
EO2304968-043	DUP A	Mercury, dissolved	7439-97-6	E509	0.000100 mg/L	0.0001 mg/L	100	70.0	130	----
Dissolved Metals (QCLot: 998152)										
EO2304968-002	MW-1C	Aluminum, dissolved	7429-90-5	E421	2.01 mg/L	2 mg/L	100	70.0	130	----
		Antimony, dissolved	7440-36-0	E421	0.200 mg/L	0.2 mg/L	100.0	70.0	130	----
		Arsenic, dissolved	7440-38-2	E421	0.202 mg/L	0.2 mg/L	101	70.0	130	----
		Barium, dissolved	7440-39-3	E421	0.195 mg/L	0.2 mg/L	97.5	70.0	130	----
		Beryllium, dissolved	7440-41-7	E421	0.388 mg/L	0.4 mg/L	97.1	70.0	130	----
		Bismuth, dissolved	7440-69-9	E421	0.0901 mg/L	0.1 mg/L	90.1	70.0	130	----
		Boron, dissolved	7440-42-8	E421	0.954 mg/L	1 mg/L	95.4	70.0	130	----
		Cadmium, dissolved	7440-43-9	E421	0.0397 mg/L	0.04 mg/L	99.3	70.0	130	----
		Calcium, dissolved	7440-70-2	E421	ND mg/L	40 mg/L	ND	70.0	130	----
		Cesium, dissolved	7440-46-2	E421	0.0986 mg/L	0.1 mg/L	98.6	70.0	130	----
		Chromium, dissolved	7440-47-3	E421	0.411 mg/L	0.4 mg/L	103	70.0	130	----
		Cobalt, dissolved	7440-48-4	E421	0.203 mg/L	0.2 mg/L	101	70.0	130	----
		Copper, dissolved	7440-50-8	E421	0.192 mg/L	0.2 mg/L	96.2	70.0	130	----
		Iron, dissolved	7439-89-6	E421	19.8 mg/L	20 mg/L	99.2	70.0	130	----
		Lead, dissolved	7439-92-1	E421	0.183 mg/L	0.2 mg/L	91.7	70.0	130	----
		Lithium, dissolved	7439-93-2	E421	0.986 mg/L	1 mg/L	98.6	70.0	130	----
		Magnesium, dissolved	7439-95-4	E421	ND mg/L	10 mg/L	ND	70.0	130	----
		Manganese, dissolved	7439-96-5	E421	0.195 mg/L	0.2 mg/L	97.6	70.0	130	----
		Molybdenum, dissolved	7439-98-7	E421	0.205 mg/L	0.2 mg/L	103	70.0	130	----
		Nickel, dissolved	7440-02-0	E421	0.398 mg/L	0.4 mg/L	99.6	70.0	130	----
		Phosphorus, dissolved	7723-14-0	E421	104 mg/L	100 mg/L	104	70.0	130	----
		Potassium, dissolved	7440-09-7	E421	41.0 mg/L	40 mg/L	102	70.0	130	----
		Rubidium, dissolved	7440-17-7	E421	0.212 mg/L	0.2 mg/L	106	70.0	130	----
		Selenium, dissolved	7782-49-2	E421	0.406 mg/L	0.4 mg/L	102	70.0	130	----
		Silicon, dissolved	7440-21-3	E421	96.8 mg/L	100 mg/L	96.8	70.0	130	----
		Silver, dissolved	7440-22-4	E421	0.0380 mg/L	0.04 mg/L	95.0	70.0	130	----
		Sodium, dissolved	7440-23-5	E421	ND mg/L	20 mg/L	ND	70.0	130	----
		Strontium, dissolved	7440-24-6	E421	ND mg/L	0.2 mg/L	ND	70.0	130	----
		Sulfur, dissolved	7704-34-9	E421	ND mg/L	200 mg/L	ND	70.0	130	----
		Tellurium, dissolved	13494-80-9	E421	0.405 mg/L	0.4 mg/L	101	70.0	130	----
		Thallium, dissolved	7440-28-0	E421	0.0359 mg/L	0.04 mg/L	89.8	70.0	130	----

Sub-Matrix: **Water**

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Matrix Spike (MS) Report: Spike Concentration	Spike Target	Recovery (%) MS	Recovery Limits (%) Low	High	Qualifier
Dissolved Metals (QCLot: 998152) - continued										
EO2304968-002	MW-1C	Thorium, dissolved	7440-29-1	E421	0.202 mg/L	0.2 mg/L	101	70.0	130	----
		Tin, dissolved	7440-31-5	E421	0.198 mg/L	0.2 mg/L	99.1	70.0	130	----
		Titanium, dissolved	7440-32-6	E421	0.429 mg/L	0.4 mg/L	107	70.0	130	----
		Tungsten, dissolved	7440-33-7	E421	0.193 mg/L	0.2 mg/L	96.4	70.0	130	----
		Uranium, dissolved	7440-61-1	E421	0.0380 mg/L	0.04 mg/L	94.9	70.0	130	----
		Vanadium, dissolved	7440-62-2	E421	1.05 mg/L	1 mg/L	105	70.0	130	----
		Zinc, dissolved	7440-66-6	E421	3.92 mg/L	4 mg/L	97.9	70.0	130	----
		Zirconium, dissolved	7440-67-7	E421	0.410 mg/L	0.4 mg/L	102	70.0	130	----
Dissolved Metals (QCLot: 998153)										
EO2304968-022	MW-26B	Aluminum, dissolved	7429-90-5	E421	2.16 mg/L	2 mg/L	108	70.0	130	----
		Antimony, dissolved	7440-36-0	E421	0.206 mg/L	0.2 mg/L	103	70.0	130	----
		Arsenic, dissolved	7440-38-2	E421	0.208 mg/L	0.2 mg/L	104	70.0	130	----
		Barium, dissolved	7440-39-3	E421	0.200 mg/L	0.2 mg/L	100	70.0	130	----
		Beryllium, dissolved	7440-41-7	E421	0.399 mg/L	0.4 mg/L	99.7	70.0	130	----
		Bismuth, dissolved	7440-69-9	E421	0.0897 mg/L	0.1 mg/L	89.7	70.0	130	----
		Boron, dissolved	7440-42-8	E421	0.944 mg/L	1 mg/L	94.4	70.0	130	----
		Cadmium, dissolved	7440-43-9	E421	0.0400 mg/L	0.04 mg/L	100.0	70.0	130	----
		Calcium, dissolved	7440-70-2	E421	ND mg/L	40 mg/L	ND	70.0	130	----
		Cesium, dissolved	7440-46-2	E421	0.102 mg/L	0.1 mg/L	102	70.0	130	----
		Chromium, dissolved	7440-47-3	E421	0.412 mg/L	0.4 mg/L	103	70.0	130	----
		Cobalt, dissolved	7440-48-4	E421	0.204 mg/L	0.2 mg/L	102	70.0	130	----
		Copper, dissolved	7440-50-8	E421	0.190 mg/L	0.2 mg/L	95.2	70.0	130	----
		Iron, dissolved	7439-89-6	E421	20.9 mg/L	20 mg/L	104	70.0	130	----
		Lead, dissolved	7439-92-1	E421	0.181 mg/L	0.2 mg/L	90.4	70.0	130	----
		Lithium, dissolved	7439-93-2	E421	1.00 mg/L	1 mg/L	100	70.0	130	----
		Magnesium, dissolved	7439-95-4	E421	ND mg/L	10 mg/L	ND	70.0	130	----
		Manganese, dissolved	7439-96-5	E421	0.204 mg/L	0.2 mg/L	102	70.0	130	----
		Molybdenum, dissolved	7439-98-7	E421	0.209 mg/L	0.2 mg/L	104	70.0	130	----
		Nickel, dissolved	7440-02-0	E421	0.398 mg/L	0.4 mg/L	99.5	70.0	130	----
		Phosphorus, dissolved	7723-14-0	E421	109 mg/L	100 mg/L	109	70.0	130	----
		Potassium, dissolved	7440-09-7	E421	41.9 mg/L	40 mg/L	105	70.0	130	----
		Rubidium, dissolved	7440-17-7	E421	0.213 mg/L	0.2 mg/L	106	70.0	130	----
		Selenium, dissolved	7782-49-2	E421	0.416 mg/L	0.4 mg/L	104	70.0	130	----
		Silicon, dissolved	7440-21-3	E421	103 mg/L	100 mg/L	103	70.0	130	----
		Silver, dissolved	7440-22-4	E421	0.0382 mg/L	0.04 mg/L	95.4	70.0	130	----

Sub-Matrix: **Water**

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Matrix Spike (MS) Report: Spike Concentration	Spike Target	Recovery (%) MS	Recovery Limits (%) Low	Recovery Limits (%) High	Qualifier
Dissolved Metals (QCLot: 998153) - continued										
EO2304968-022	MW-26B	Sodium, dissolved	7440-23-5	E421	ND mg/L	20 mg/L	ND	70.0	130	----
		Strontium, dissolved	7440-24-6	E421	ND mg/L	0.2 mg/L	ND	70.0	130	----
		Sulfur, dissolved	7704-34-9	E421	ND mg/L	200 mg/L	ND	70.0	130	----
		Tellurium, dissolved	13494-80-9	E421	0.421 mg/L	0.4 mg/L	105	70.0	130	----
		Thallium, dissolved	7440-28-0	E421	0.0355 mg/L	0.04 mg/L	88.8	70.0	130	----
		Thorium, dissolved	7440-29-1	E421	0.200 mg/L	0.2 mg/L	99.9	70.0	130	----
		Tin, dissolved	7440-31-5	E421	0.202 mg/L	0.2 mg/L	101	70.0	130	----
		Titanium, dissolved	7440-32-6	E421	0.413 mg/L	0.4 mg/L	103	70.0	130	----
		Tungsten, dissolved	7440-33-7	E421	0.192 mg/L	0.2 mg/L	95.8	70.0	130	----
		Uranium, dissolved	7440-61-1	E421	0.0376 mg/L	0.04 mg/L	94.0	70.0	130	----
		Vanadium, dissolved	7440-62-2	E421	1.06 mg/L	1 mg/L	106	70.0	130	----
		Zinc, dissolved	7440-66-6	E421	3.90 mg/L	4 mg/L	97.6	70.0	130	----
		Zirconium, dissolved	7440-67-7	E421	0.425 mg/L	0.4 mg/L	106	70.0	130	----
Dissolved Metals (QCLot: 998154)										
EO2304968-043	DUP A	Aluminum, dissolved	7429-90-5	E421	2.12 mg/L	2 mg/L	106	70.0	130	----
		Antimony, dissolved	7440-36-0	E421	0.205 mg/L	0.2 mg/L	102	70.0	130	----
		Arsenic, dissolved	7440-38-2	E421	0.206 mg/L	0.2 mg/L	103	70.0	130	----
		Barium, dissolved	7440-39-3	E421	0.204 mg/L	0.2 mg/L	102	70.0	130	----
		Beryllium, dissolved	7440-41-7	E421	0.413 mg/L	0.4 mg/L	103	70.0	130	----
		Bismuth, dissolved	7440-69-9	E421	0.0964 mg/L	0.1 mg/L	96.4	70.0	130	----
		Boron, dissolved	7440-42-8	E421	0.807 mg/L	1 mg/L	80.7	70.0	130	----
		Cadmium, dissolved	7440-43-9	E421	0.0412 mg/L	0.04 mg/L	103	70.0	130	----
		Calcium, dissolved	7440-70-2	E421	39.9 mg/L	40 mg/L	99.9	70.0	130	----
		Cesium, dissolved	7440-46-2	E421	0.102 mg/L	0.1 mg/L	102	70.0	130	----
		Chromium, dissolved	7440-47-3	E421	0.405 mg/L	0.4 mg/L	101	70.0	130	----
		Cobalt, dissolved	7440-48-4	E421	0.207 mg/L	0.2 mg/L	103	70.0	130	----
		Copper, dissolved	7440-50-8	E421	0.197 mg/L	0.2 mg/L	98.6	70.0	130	----
		Iron, dissolved	7439-89-6	E421	20.6 mg/L	20 mg/L	103	70.0	130	----
		Lead, dissolved	7439-92-1	E421	0.194 mg/L	0.2 mg/L	97.0	70.0	130	----
		Lithium, dissolved	7439-93-2	E421	1.06 mg/L	1 mg/L	106	70.0	130	----
		Magnesium, dissolved	7439-95-4	E421	10.2 mg/L	10 mg/L	102	70.0	130	----
		Manganese, dissolved	7439-96-5	E421	0.206 mg/L	0.2 mg/L	103	70.0	130	----
		Molybdenum, dissolved	7439-98-7	E421	0.206 mg/L	0.2 mg/L	103	70.0	130	----
		Nickel, dissolved	7440-02-0	E421	0.415 mg/L	0.4 mg/L	104	70.0	130	----
		Phosphorus, dissolved	7723-14-0	E421	103 mg/L	100 mg/L	103	70.0	130	----

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Dissolved Metals (QCLot: 998154) - continued										
EO2304968-043	DUP A	Potassium, dissolved	7440-09-7	E421	42.2 mg/L	40 mg/L	105	70.0	130	----
		Rubidium, dissolved	7440-17-7	E421	0.214 mg/L	0.2 mg/L	107	70.0	130	----
		Selenium, dissolved	7782-49-2	E421	0.408 mg/L	0.4 mg/L	102	70.0	130	----
		Silicon, dissolved	7440-21-3	E421	100 mg/L	100 mg/L	100	70.0	130	----
		Silver, dissolved	7440-22-4	E421	0.0388 mg/L	0.04 mg/L	97.0	70.0	130	----
		Sodium, dissolved	7440-23-5	E421	ND mg/L	20 mg/L	ND	70.0	130	----
		Strontium, dissolved	7440-24-6	E421	0.210 mg/L	0.2 mg/L	105	70.0	130	----
		Sulfur, dissolved	7704-34-9	E421	196 mg/L	200 mg/L	98.0	70.0	130	----
		Tellurium, dissolved	13494-80-9	E421	0.411 mg/L	0.4 mg/L	103	70.0	130	----
		Thallium, dissolved	7440-28-0	E421	0.0381 mg/L	0.04 mg/L	95.2	70.0	130	----
		Thorium, dissolved	7440-29-1	E421	0.212 mg/L	0.2 mg/L	106	70.0	130	----
		Tin, dissolved	7440-31-5	E421	0.202 mg/L	0.2 mg/L	101	70.0	130	----
		Titanium, dissolved	7440-32-6	E421	0.433 mg/L	0.4 mg/L	108	70.0	130	----
		Tungsten, dissolved	7440-33-7	E421	0.193 mg/L	0.2 mg/L	96.5	70.0	130	----
		Uranium, dissolved	7440-61-1	E421	0.0385 mg/L	0.04 mg/L	96.2	70.0	130	----
		Vanadium, dissolved	7440-62-2	E421	1.05 mg/L	1 mg/L	105	70.0	130	----
		Zinc, dissolved	7440-66-6	E421	4.02 mg/L	4 mg/L	100	70.0	130	----
		Zirconium, dissolved	7440-67-7	E421	0.428 mg/L	0.4 mg/L	107	70.0	130	----
Aggregate Organics (QCLot: 1000147)										
CG2308044-007	Anonymous	Phenols, total (4AAP)	----	E562	0.0210 mg/L	0.02 mg/L	105	75.0	125	----
Aggregate Organics (QCLot: 1000152)										
EO2304968-017	MW-23A	Phenols, total (4AAP)	----	E562	0.0191 mg/L	0.02 mg/L	95.4	75.0	125	----
Aggregate Organics (QCLot: 1003714)										
EO2304968-037	MW-35-DEEP	Phenols, total (4AAP)	----	E562	0.0192 mg/L	0.02 mg/L	96.2	75.0	125	----
Volatile Organic Compounds (QCLot: 1000805)										
EO2304968-037	MW-35-DEEP	Benzene	71-43-2	E611E	87.0 µg/L	100 µg/L	87.0	50.0	140	----
		Bromobenzene	108-86-1	E611E	92.1 µg/L	100 µg/L	92.1	50.0	140	----
		Bromochloromethane	74-97-5	E611E	82.2 µg/L	100 µg/L	82.2	50.0	140	----
		Bromodichloromethane	75-27-4	E611E	77.7 µg/L	100 µg/L	77.7	50.0	140	----
		Bromoform	75-25-2	E611E	90.6 µg/L	100 µg/L	90.6	50.0	140	----
		Bromomethane	74-83-9	E611E	91.8 µg/L	100 µg/L	91.8	50.0	140	----
		Butylbenzene, n-	104-51-8	E611E	95.6 µg/L	100 µg/L	95.6	50.0	140	----
		Butylbenzene, sec-	135-98-8	E611E	99.4 µg/L	100 µg/L	99.4	50.0	140	----
		Butylbenzene, tert-	98-06-6	E611E	93.4 µg/L	100 µg/L	93.4	50.0	140	----

Sub-Matrix: **Water**

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Matrix Spike (MS) Report: Spike Concentration	Spike Target	Recovery (%) MS	Recovery Limits (%) Low	Recovery Limits (%) High	Qualifier
Volatile Organic Compounds (QCLot: 1000805) - continued										
EO2304968-037	MW-35-DEEP	Carbon tetrachloride	56-23-5	E611E	89.0 µg/L	100 µg/L	89.0	50.0	140	----
		Chlorobenzene	108-90-7	E611E	116 µg/L	100 µg/L	116	50.0	140	----
		Chloroethane	75-00-3	E611E	87.9 µg/L	100 µg/L	87.9	50.0	140	----
		Chloroform	67-66-3	E611E	84.4 µg/L	100 µg/L	84.4	50.0	140	----
		Chloromethane	74-87-3	E611E	92.2 µg/L	100 µg/L	92.2	50.0	140	----
		Chlorotoluene, 2-	95-49-8	E611E	89.6 µg/L	100 µg/L	89.6	50.0	140	----
		Chlorotoluene, 4-	106-43-4	E611E	87.2 µg/L	100 µg/L	87.2	50.0	140	----
		Cymene, p-	99-87-6	E611E	91.9 µg/L	100 µg/L	91.9	50.0	140	----
		Dibromo-3-chloropropane, 1,2-	96-12-8	E611E	99.2 µg/L	100 µg/L	99.2	50.0	140	----
		Dibromochloromethane	124-48-1	E611E	120 µg/L	100 µg/L	120	50.0	140	----
		Dibromoethane, 1,2-	106-93-4	E611E	104 µg/L	100 µg/L	104	50.0	140	----
		Dibromomethane	74-95-3	E611E	79.0 µg/L	100 µg/L	79.0	50.0	140	----
		Dichlorobenzene, 1,2-	95-50-1	E611E	105 µg/L	100 µg/L	105	50.0	140	----
		Dichlorobenzene, 1,3-	541-73-1	E611E	104 µg/L	100 µg/L	104	50.0	140	----
		Dichlorobenzene, 1,4-	106-46-7	E611E	109 µg/L	100 µg/L	109	50.0	140	----
		Dichlorodifluoromethane	75-71-8	E611E	119 µg/L	100 µg/L	119	50.0	140	----
		Dichloroethane, 1,1-	75-34-3	E611E	89.0 µg/L	100 µg/L	89.0	50.0	140	----
		Dichloroethane, 1,2-	107-06-2	E611E	79.1 µg/L	100 µg/L	79.1	50.0	140	----
		Dichloroethylene, 1,1-	75-35-4	E611E	80.6 µg/L	100 µg/L	80.6	50.0	140	----
		Dichloroethylene, cis-1,2-	156-59-2	E611E	75.4 µg/L	100 µg/L	75.4	50.0	140	----
		Dichloroethylene, trans-1,2-	156-60-5	E611E	72.1 µg/L	100 µg/L	72.1	50.0	140	----
		Dichloromethane	75-09-2	E611E	80.7 µg/L	100 µg/L	80.7	50.0	140	----
		Dichloropropane, 1,2-	78-87-5	E611E	83.0 µg/L	100 µg/L	83.0	50.0	140	----
		Dichloropropane, 1,3-	142-28-9	E611E	102 µg/L	100 µg/L	102	50.0	140	----
		Dichloropropane, 2,2-	594-20-7	E611E	78.2 µg/L	100 µg/L	78.2	50.0	140	----
		Dichloropropylene, 1,1-	563-58-6	E611E	77.3 µg/L	100 µg/L	77.3	50.0	140	----
		Dichloropropylene, cis-1,3-	10061-01-5	E611E	76.4 µg/L	100 µg/L	76.4	50.0	140	----
		Dichloropropylene, trans-1,3-	10061-02-6	E611E	89.5 µg/L	100 µg/L	89.5	50.0	140	----
		Ethylbenzene	100-41-4	E611E	116 µg/L	100 µg/L	116	50.0	140	----
		Hexachlorobutadiene	87-68-3	E611E	102 µg/L	100 µg/L	102	50.0	140	----
		Isopropylbenzene	98-82-8	E611E	101 µg/L	100 µg/L	101	50.0	140	----
		Methyl-tert-butyl ether [MTBE]	1634-04-4	E611E	102 µg/L	100 µg/L	102	50.0	140	----
		Propylbenzene, n-	103-65-1	E611E	127 µg/L	100 µg/L	127	50.0	140	----
		Styrene	100-42-5	E611E	129 µg/L	100 µg/L	129	50.0	140	----
		Tetrachloroethane, 1,1,1,2-	630-20-6	E611E	116 µg/L	100 µg/L	116	50.0	140	----

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Volatile Organic Compounds (QCLot: 1000805) - continued										
EO2304968-037	MW-35-DEEP	Tetrachloroethane, 1,1,2,2-	79-34-5	E611E	98.2 µg/L	100 µg/L	98.2	50.0	140	----
		Tetrachloroethylene	127-18-4	E611E	110 µg/L	100 µg/L	110	50.0	140	----
		Toluene	108-88-3	E611E	99.6 µg/L	100 µg/L	99.6	50.0	140	----
		Trichlorobenzene, 1,2,3-	87-61-6	E611E	129 µg/L	100 µg/L	129	50.0	140	----
		Trichlorobenzene, 1,2,4-	120-82-1	E611E	108 µg/L	100 µg/L	108	50.0	140	----
		Trichloroethane, 1,1,1-	71-55-6	E611E	84.4 µg/L	100 µg/L	84.4	50.0	140	----
		Trichloroethane, 1,1,2-	79-00-5	E611E	110 µg/L	100 µg/L	110	50.0	140	----
		Trichloroethylene	79-01-6	E611E	88.7 µg/L	100 µg/L	88.7	50.0	140	----
		Trichlorofluoromethane	75-69-4	E611E	90.2 µg/L	100 µg/L	90.2	50.0	140	----
		Trichloropropane, 1,2,3-	96-18-4	E611E	91.9 µg/L	100 µg/L	91.9	50.0	140	----
		Trimethylbenzene, 1,2,4-	95-63-6	E611E	100 µg/L	100 µg/L	100	50.0	140	----
		Trimethylbenzene, 1,3,5-	108-67-8	E611E	95.7 µg/L	100 µg/L	95.7	50.0	140	----
		Vinyl chloride	75-01-4	E611E	99.9 µg/L	100 µg/L	99.9	50.0	140	----
		Xylene, m+p-	179601-23-1	E611E	247 µg/L	200 µg/L	124	50.0	140	----
		Xylene, o-	95-47-6	E611E	121 µg/L	100 µg/L	121	50.0	140	----
Volatile Organic Compounds (QCLot: 1000806)										
EO2304968-037	MW-35-DEEP	Benzene	71-43-2	E611A	87.0 µg/L	100 µg/L	87.0	50.0	140	----
		Ethylbenzene	100-41-4	E611A	116 µg/L	100 µg/L	116	50.0	140	----
		Styrene	100-42-5	E611A	129 µg/L	100 µg/L	129	50.0	140	----
		Toluene	108-88-3	E611A	99.6 µg/L	100 µg/L	99.6	50.0	140	----
		Xylene, m+p-	179601-23-1	E611A	247 µg/L	200 µg/L	124	50.0	140	----
		Xylene, o-	95-47-6	E611A	121 µg/L	100 µg/L	121	50.0	140	----
Volatile Organic Compounds (QCLot: 996595)										
EO2304960-001	Anonymous	Benzene	71-43-2	E611A	121 µg/L	100 µg/L	121	50.0	140	----
		Ethylbenzene	100-41-4	E611A	91.9 µg/L	100 µg/L	91.9	50.0	140	----
		Styrene	100-42-5	E611A	94.4 µg/L	100 µg/L	94.4	50.0	140	----
		Toluene	108-88-3	E611A	93.3 µg/L	100 µg/L	93.3	50.0	140	----
		Xylene, m+p-	179601-23-1	E611A	208 µg/L	200 µg/L	104	50.0	140	----
		Xylene, o-	95-47-6	E611A	85.8 µg/L	100 µg/L	85.8	50.0	140	----
Volatile Organic Compounds (QCLot: 996596)										
EO2304968-002	MW-1C	Benzene	71-43-2	E611E	98.7 µg/L	100 µg/L	98.7	50.0	140	----
		Bromobenzene	108-86-1	E611E	104 µg/L	100 µg/L	104	50.0	140	----
		Bromochloromethane	74-97-5	E611E	131 µg/L	100 µg/L	131	50.0	140	----
		Bromodichloromethane	75-27-4	E611E	90.1 µg/L	100 µg/L	90.1	50.0	140	----

Sub-Matrix: **Water**

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Matrix Spike (MS) Report: Spike Concentration	Spike Target	Recovery (%) MS	Recovery Limits (%) Low	Recovery Limits (%) High	Qualifier
Volatile Organic Compounds (QCLot: 996596) - continued										
EO2304968-002	MW-1C	Bromoform	75-25-2	E611E	116 µg/L	100 µg/L	116	50.0	140	----
		Bromomethane	74-83-9	E611E	97.3 µg/L	100 µg/L	97.3	50.0	140	----
		Butylbenzene, n-	104-51-8	E611E	92.4 µg/L	100 µg/L	92.4	50.0	140	----
		Butylbenzene, sec-	135-98-8	E611E	127 µg/L	100 µg/L	127	50.0	140	----
		Butylbenzene, tert-	98-06-6	E611E	111 µg/L	100 µg/L	111	50.0	140	----
		Carbon tetrachloride	56-23-5	E611E	116 µg/L	100 µg/L	116	50.0	140	----
		Chlorobenzene	108-90-7	E611E	83.3 µg/L	100 µg/L	83.3	50.0	140	----
		Chloroethane	75-00-3	E611E	84.2 µg/L	100 µg/L	84.2	50.0	140	----
		Chloroform	67-66-3	E611E	95.9 µg/L	100 µg/L	95.9	50.0	140	----
		Chloromethane	74-87-3	E611E	73.3 µg/L	100 µg/L	73.3	50.0	140	----
		Chlorotoluene, 2-	95-49-8	E611E	118 µg/L	100 µg/L	118	50.0	140	----
		Chlorotoluene, 4-	106-43-4	E611E	108 µg/L	100 µg/L	108	50.0	140	----
		Cymene, p-	99-87-6	E611E	101 µg/L	100 µg/L	101	50.0	140	----
		Dibromo-3-chloropropane, 1,2-	96-12-8	E611E	97.0 µg/L	100 µg/L	97.0	50.0	140	----
		Dibromochloromethane	124-48-1	E611E	120 µg/L	100 µg/L	120	50.0	140	----
		Dibromoethane, 1,2-	106-93-4	E611E	70.5 µg/L	100 µg/L	70.5	50.0	140	----
		Dibromomethane	74-95-3	E611E	124 µg/L	100 µg/L	124	50.0	140	----
		Dichlorobenzene, 1,2-	95-50-1	E611E	99.0 µg/L	100 µg/L	99.0	50.0	140	----
		Dichlorobenzene, 1,3-	541-73-1	E611E	96.0 µg/L	100 µg/L	96.0	50.0	140	----
		Dichlorobenzene, 1,4-	106-46-7	E611E	111 µg/L	100 µg/L	111	50.0	140	----
		Dichlorodifluoromethane	75-71-8	E611E	114 µg/L	100 µg/L	114	50.0	140	----
		Dichloroethane, 1,1-	75-34-3	E611E	112 µg/L	100 µg/L	112	50.0	140	----
		Dichloroethane, 1,2-	107-06-2	E611E	88.7 µg/L	100 µg/L	88.7	50.0	140	----
		Dichloroethylene, 1,1-	75-35-4	E611E	93.6 µg/L	100 µg/L	93.6	50.0	140	----
		Dichloroethylene, cis-1,2-	156-59-2	E611E	80.7 µg/L	100 µg/L	80.7	50.0	140	----
		Dichloroethylene, trans-1,2-	156-60-5	E611E	88.9 µg/L	100 µg/L	88.9	50.0	140	----
		Dichloromethane	75-09-2	E611E	106 µg/L	100 µg/L	106	50.0	140	----
		Dichloropropane, 1,2-	78-87-5	E611E	79.6 µg/L	100 µg/L	79.6	50.0	140	----
		Dichloropropane, 1,3-	142-28-9	E611E	79.3 µg/L	100 µg/L	79.3	50.0	140	----
		Dichloropropane, 2,2-	594-20-7	E611E	88.6 µg/L	100 µg/L	88.6	50.0	140	----
		Dichloropropylene, 1,1-	563-58-6	E611E	70.6 µg/L	100 µg/L	70.6	50.0	140	----
		Dichloropropylene, cis-1,3-	10061-01-5	E611E	96.8 µg/L	100 µg/L	96.8	50.0	140	----
		Dichloropropylene, trans-1,3-	10061-02-6	E611E	93.4 µg/L	100 µg/L	93.4	50.0	140	----
		Ethylbenzene	100-41-4	E611E	87.4 µg/L	100 µg/L	87.4	50.0	140	----
		Hexachlorobutadiene	87-68-3	E611E	77.7 µg/L	100 µg/L	77.7	50.0	140	----

Sub-Matrix: **Water**

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Matrix Spike (MS) Report: Spike Concentration	Spike Target	Recovery (%) MS	Recovery Limits (%) Low	Recovery Limits (%) High	Qualifier
Volatile Organic Compounds (QCLot: 996596) - continued										
EO2304968-002	MW-1C	Isopropylbenzene	98-82-8	E611E	102 µg/L	100 µg/L	102	50.0	140	----
		Methyl-tert-butyl ether [MTBE]	1634-04-4	E611E	95.1 µg/L	100 µg/L	95.1	50.0	140	----
		Propylbenzene, n-	103-65-1	E611E	94.8 µg/L	100 µg/L	94.8	50.0	140	----
		Styrene	100-42-5	E611E	81.5 µg/L	100 µg/L	81.5	50.0	140	----
		Tetrachloroethane, 1,1,1,2-	630-20-6	E611E	99.9 µg/L	100 µg/L	99.9	50.0	140	----
		Tetrachloroethane, 1,1,2,2-	79-34-5	E611E	101 µg/L	100 µg/L	101	50.0	140	----
		Tetrachloroethylene	127-18-4	E611E	118 µg/L	100 µg/L	118	50.0	140	----
		Toluene	108-88-3	E611E	87.6 µg/L	100 µg/L	87.6	50.0	140	----
		Trichlorobenzene, 1,2,3-	87-61-6	E611E	114 µg/L	100 µg/L	114	50.0	140	----
		Trichlorobenzene, 1,2,4-	120-82-1	E611E	120 µg/L	100 µg/L	120	50.0	140	----
		Trichloroethane, 1,1,1-	71-55-6	E611E	78.2 µg/L	100 µg/L	78.2	50.0	140	----
		Trichloroethane, 1,1,2-	79-00-5	E611E	83.1 µg/L	100 µg/L	83.1	50.0	140	----
		Trichloroethylene	79-01-6	E611E	101 µg/L	100 µg/L	101	50.0	140	----
		Trichlorofluoromethane	75-69-4	E611E	122 µg/L	100 µg/L	122	50.0	140	----
		Trichloropropane, 1,2,3-	96-18-4	E611E	101 µg/L	100 µg/L	101	50.0	140	----
		Trimethylbenzene, 1,2,4-	95-63-6	E611E	121 µg/L	100 µg/L	121	50.0	140	----
		Trimethylbenzene, 1,3,5-	108-67-8	E611E	112 µg/L	100 µg/L	112	50.0	140	----
		Vinyl chloride	75-01-4	E611E	74.9 µg/L	100 µg/L	74.9	50.0	140	----
		Xylene, m+p-	179601-23-1	E611E	186 µg/L	200 µg/L	93.2	50.0	140	----
		Xylene, o-	95-47-6	E611E	79.7 µg/L	100 µg/L	79.7	50.0	140	----
Volatile Organic Compounds (QCLot: 998108)										
EO2304968-017	MW-23A	Benzene	71-43-2	E611E	104 µg/L	100 µg/L	104	50.0	140	----
		Bromobenzene	108-86-1	E611E	117 µg/L	100 µg/L	117	50.0	140	----
		Bromochloromethane	74-97-5	E611E	126 µg/L	100 µg/L	126	50.0	140	----
		Bromodichloromethane	75-27-4	E611E	100 µg/L	100 µg/L	100	50.0	140	----
		Bromoform	75-25-2	E611E	107 µg/L	100 µg/L	107	50.0	140	----
		Bromomethane	74-83-9	E611E	99.9 µg/L	100 µg/L	99.9	50.0	140	----
		Butylbenzene, n-	104-51-8	E611E	102 µg/L	100 µg/L	102	50.0	140	----
		Butylbenzene, sec-	135-98-8	E611E	103 µg/L	100 µg/L	103	50.0	140	----
		Butylbenzene, tert-	98-06-6	E611E	104 µg/L	100 µg/L	104	50.0	140	----
		Carbon tetrachloride	56-23-5	E611E	129 µg/L	100 µg/L	129	50.0	140	----
		Chlorobenzene	108-90-7	E611E	98.9 µg/L	100 µg/L	98.9	50.0	140	----
		Chloroethane	75-00-3	E611E	121 µg/L	100 µg/L	121	50.0	140	----
		Chloroform	67-66-3	E611E	108 µg/L	100 µg/L	108	50.0	140	----
		Chloromethane	74-87-3	E611E	116 µg/L	100 µg/L	116	50.0	140	----

Sub-Matrix: **Water**

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Matrix Spike (MS) Report: Spike Concentration	Spike Target	Recovery (%) MS	Recovery Limits (%) Low	Recovery Limits (%) High	Qualifier
Volatile Organic Compounds (QCLot: 998108) - continued										
EO2304968-017	MW-23A	Chlorotoluene, 2-	95-49-8	E611E	118 µg/L	100 µg/L	118	50.0	140	----
		Chlorotoluene, 4-	106-43-4	E611E	117 µg/L	100 µg/L	117	50.0	140	----
		Cymene, p-	99-87-6	E611E	118 µg/L	100 µg/L	118	50.0	140	----
		Dibromo-3-chloropropane, 1,2-	96-12-8	E611E	105 µg/L	100 µg/L	105	50.0	140	----
		Dibromochloromethane	124-48-1	E611E	101 µg/L	100 µg/L	101	50.0	140	----
		Dibromoethane, 1,2-	106-93-4	E611E	84.2 µg/L	100 µg/L	84.2	50.0	140	----
		Dibromomethane	74-95-3	E611E	84.7 µg/L	100 µg/L	84.7	50.0	140	----
		Dichlorobenzene, 1,2-	95-50-1	E611E	110 µg/L	100 µg/L	110	50.0	140	----
		Dichlorobenzene, 1,3-	541-73-1	E611E	107 µg/L	100 µg/L	107	50.0	140	----
		Dichlorobenzene, 1,4-	106-46-7	E611E	115 µg/L	100 µg/L	115	50.0	140	----
		Dichlorodifluoromethane	75-71-8	E611E	97.0 µg/L	100 µg/L	97.0	50.0	140	----
		Dichloroethane, 1,1-	75-34-3	E611E	110 µg/L	100 µg/L	110	50.0	140	----
		Dichloroethane, 1,2-	107-06-2	E611E	103 µg/L	100 µg/L	103	50.0	140	----
		Dichloroethylene, 1,1-	75-35-4	E611E	125 µg/L	100 µg/L	125	50.0	140	----
		Dichloroethylene, cis-1,2-	156-59-2	E611E	98.0 µg/L	100 µg/L	98.0	50.0	140	----
		Dichloroethylene, trans-1,2-	156-60-5	E611E	129 µg/L	100 µg/L	129	50.0	140	----
		Dichloromethane	75-09-2	E611E	116 µg/L	100 µg/L	116	50.0	140	----
		Dichloropropane, 1,2-	78-87-5	E611E	90.5 µg/L	100 µg/L	90.5	50.0	140	----
		Dichloropropane, 1,3-	142-28-9	E611E	90.0 µg/L	100 µg/L	90.0	50.0	140	----
		Dichloropropane, 2,2-	594-20-7	E611E	60.3 µg/L	100 µg/L	60.3	50.0	140	----
		Dichloropropylene, 1,1-	563-58-6	E611E	98.5 µg/L	100 µg/L	98.5	50.0	140	----
		Dichloropropylene, cis-1,3-	10061-01-5	E611E	77.3 µg/L	100 µg/L	77.3	50.0	140	----
		Dichloropropylene, trans-1,3-	10061-02-6	E611E	91.2 µg/L	100 µg/L	91.2	50.0	140	----
		Ethylbenzene	100-41-4	E611E	112 µg/L	100 µg/L	112	50.0	140	----
		Hexachlorobutadiene	87-68-3	E611E	103 µg/L	100 µg/L	103	50.0	140	----
		Isopropylbenzene	98-82-8	E611E	105 µg/L	100 µg/L	105	50.0	140	----
		Methyl-tert-butyl ether [MTBE]	1634-04-4	E611E	107 µg/L	100 µg/L	107	50.0	140	----
		Propylbenzene, n-	103-65-1	E611E	120 µg/L	100 µg/L	120	50.0	140	----
		Styrene	100-42-5	E611E	97.1 µg/L	100 µg/L	97.1	50.0	140	----
		Tetrachloroethane, 1,1,1,2-	630-20-6	E611E	113 µg/L	100 µg/L	113	50.0	140	----
		Tetrachloroethane, 1,1,2,2-	79-34-5	E611E	102 µg/L	100 µg/L	102	50.0	140	----
		Tetrachloroethylene	127-18-4	E611E	99.3 µg/L	100 µg/L	99.3	50.0	140	----
		Toluene	108-88-3	E611E	111 µg/L	100 µg/L	111	50.0	140	----
		Trichlorobenzene, 1,2,3-	87-61-6	E611E	123 µg/L	100 µg/L	123	50.0	140	----
		Trichlorobenzene, 1,2,4-	120-82-1	E611E	119 µg/L	100 µg/L	119	50.0	140	----

Sub-Matrix: **Water**

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Matrix Spike (MS) Report: Spike Concentration	Spike Target	Recovery (%) MS	Recovery Limits (%) Low	Recovery Limits (%) High	Qualifier
Volatile Organic Compounds (QCLot: 998108) - continued										
EO2304968-017	MW-23A	Trichloroethane, 1,1,1-	71-55-6	E611E	95.9 µg/L	100 µg/L	95.9	50.0	140	----
		Trichloroethane, 1,1,2-	79-00-5	E611E	93.2 µg/L	100 µg/L	93.2	50.0	140	----
		Trichloroethylene	79-01-6	E611E	119 µg/L	100 µg/L	119	50.0	140	----
		Trichlorofluoromethane	75-69-4	E611E	129 µg/L	100 µg/L	129	50.0	140	----
		Trichloropropane, 1,2,3-	96-18-4	E611E	104 µg/L	100 µg/L	104	50.0	140	----
		Trimethylbenzene, 1,2,4-	95-63-6	E611E	121 µg/L	100 µg/L	121	50.0	140	----
		Trimethylbenzene, 1,3,5-	108-67-8	E611E	125 µg/L	100 µg/L	125	50.0	140	----
		Vinyl chloride	75-01-4	E611E	112 µg/L	100 µg/L	112	50.0	140	----
		Xylene, m+p-	179601-23-1	E611E	215 µg/L	200 µg/L	108	50.0	140	----
		Xylene, o-	95-47-6	E611E	97.0 µg/L	100 µg/L	97.0	50.0	140	----
Volatile Organic Compounds (QCLot: 998109)										
EO2304968-017	MW-23A	Benzene	71-43-2	E611A	104 µg/L	100 µg/L	104	50.0	140	----
		Ethylbenzene	100-41-4	E611A	112 µg/L	100 µg/L	112	50.0	140	----
		Styrene	100-42-5	E611A	97.1 µg/L	100 µg/L	97.1	50.0	140	----
		Toluene	108-88-3	E611A	111 µg/L	100 µg/L	111	50.0	140	----
		Xylene, m+p-	179601-23-1	E611A	215 µg/L	200 µg/L	108	50.0	140	----
		Xylene, o-	95-47-6	E611A	97.0 µg/L	100 µg/L	97.0	50.0	140	----

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Affix ALS barcode label here (lab use only)

COC Number: 17 -

Report To	Contact and company name below will appear on the final report
Company:	Tetra Tech
Contact:	Carl Forkheim
Phone:	403-510-7241
	Company address below will appear on the final report
Street:	Suite 110, 140 Quarry Park Blvd SE
City/Province:	Calgary AB
Postal Code:	T2C 3G3
Invoice To	Same as Report To ☐ YES ☐ NO
	Copy of Invoice with Report ☐ YES ☐ NO
Company:	Clean Harbors
Contact:	

Report Format / Distribution

Select Report Format: ☑ PDF ☐ EXCEL ☑ EDD (DIGITAL)

Quality Control (QC) Report with Report ☑ YES ☐ NO

☐ Compare Results to Criteria on Report - provide details below if box checked

Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX

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Email 3 Carl.Forkheim@tetratech.com

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Select Service Level Below - Contact your AM to confirm all E&P TATs (surcharges may apply)

Regular [R] ☑ Standard TAT if received by 3 pm - business days - no surcharges apply

PRIORITY (Business Days)		EMERGENCY	
	4 day [P4-20%] ☐		1 Business day [E - 100%] ☐
	3 day [P3-25%] ☐		Same Day, Weekend or Statutory holiday [E2 -200% (Laboratory opening fees may apply)] ☐
	2 day [P2-50%] ☐		

Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm

For tests that can not be performed according to the service level selected, you will be contacted.

Project Information

ALS Account # / Quote #: Q83988

Job #: SWM.SWOP04591-03

PO / AFE:

LSD:

Oil and Gas Required Fields (client use)

AFE/Cost Center: PO#

Major/Minor Code: Routing Code:

Requisitioner:

Location:

ALS Lab Work Order # (lab use only): EO2304968

ALS Contact: Sampler:

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	Routine Parameters	Dissolved Metals (including Hg)	Nutrients (TKN, Ammonia-N, DOC)	BTEX and F1-F2	Total Phenols	VOC, TCE and PCE	SAMPLES ON HOLD	SUSPECTED HAZARD (see Special Instructions)
	MW-1B	15-Jun-23	1415	Water	9	✓	✓	✓	✓	✓	✓		
	MW-1C	"	1430	Water									
	MW-8A	"	1300	Water									
	MW-8B	"	1315	Water									
	MW-10	"	1320	Water									
	MW-11	"	1405	Water									
	MW-18A	"	1500	Water									
	MW-18B	"	1515	Water									
	MW-19A	"	1545	Water									
	MW-19B	"	1600	Water									
	MW-20A	"	1610	Water									
	MW-20B	"	1615	Water									

Environmental Division
Edmonton
Work Order Reference
EO2304968

Telephone : +1 780 413 5227

Drinking Water (DW) Samples[1] (client use)

re samples taken from a Regulated DW System?
☐ YES ☐ NO

re samples for human consumption/ use?
☐ YES ☐ NO

Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)

Please include ESdat EDD deliverable

SAMPLE CONDITION AS

Frozen ☐ SIF Observations Yes ☐ No ☐

Ice Packs ☐ Ice Cubes ☐ Custody seal intact Yes ☐ No ☐

Cooling Initiated ☐

INITIAL COOLER TEMPERATURES °C			FINAL COOLER TEMPERATURES °C		
4.6	6.4	11.7			

SHIPMENT RELEASE (client use)

Released by:	Date:	Time:

INITIAL SHIPMENT RECEPTION (lab use only)

Received by:	Date:	Time:
	16/6/23	4:35

FINAL SHIPMENT RECEPTION (lab use only)

Received by:	Date:	Time:

:FER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

lure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

f any water samples are taken from a **Regulated Drinking Water (DW) System**, please submit using an **Authorized DW COC form.**

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

NOV 2018 FRONT

Chain of Custody (COC) / Analytical Request Form

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

Affix ALS barcode label here (lab use only)

COC Number: 17 -

Report To	Contact and company name below will appear on the final report
Company:	Tetra Tech
Contact:	Carl Forkheim
Phone:	403-510-7241
	Company address below will appear on the final report
Street:	Suite 110, 140 Quarry Park Blvd SE
City/Province:	Calgary AB
Postal Code:	T2C 3G3
Invoice To	Same as Report To ☐ YES ☐ NO
	Copy of Invoice with Report ☐ YES ☐ NO
Company:	Clean Harbors
Contact:	

Report Format / Distribution

Select Report Format: ☑ PDF ☐ EXCEL ☑ EDD (DIGITAL)

Quality Control (QC) Report with Report ☑ YES ☐ NO

☐ Compare Results to Criteria on Report - provide details below if box checked

Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax EBA.labdata@tetratech.com

Email 2 ets.svc.eba_esdat@tetratech.com

Email 3 Carl.Forkheim@tetratech.com

Invoice Distribution

Select Invoice Distribution: ☐ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax

Email 2

Select Service Level Below - Contact your AM to confirm all E&P TATs (surcharges may apply)

Regular [R] ☑ Standard TAT if received by 3 pm - business days - no surcharges apply

PRIORITY (Business Days)		EMERGENCY	
	4 day [P4-20%] ☐		1 Business day [E - 100%] ☐
	3 day [P3-25%] ☐		Same Day, Weekend or Statutory holiday [E2 -200% (Laboratory opening fees may apply)] ☐
	2 day [P2-50%] ☐		

Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm

For tests that can not be performed according to the service level selected, you will be contacted.

Project Information

ALS Account # / Quote #: Q83988

Job #: 704-SWM.SWOP04591-03

PO / AFE:

LSD:

Oil and Gas Required Fields (client use)

AFE/Cost Center: PO#

Major/Minor Code: Routing Code:

Requisitioner:

Location:

ALS Lab Work Order # (lab use only):

ALS Contact: Sampler:

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	Routine Parameters	Dissolved Metals (including Hg)	Nutrients (TKN, Ammonia-N, DOC)	BTEX and F1-F2	Total Phenols	VOC, TCE and PCE	SAMPLES ON HOLD	SUSPECTED HAZARD (see Special Instructions)
	MW-21A	15-Jun-23	1640	Water	9	✓	✓	✓	✓	✓	✓		
	MW-21B	"	1650	Water	1	1	1	1	1	1	1		
	MW-22A	16-Jun-23	1340	Water	1	1	1	1	1	1	1		
	MW-22B		1345	Water	1	1	1	1	1	1	1		
	MW-23A		1320	Water	1	1	1	1	1	1	1		
	MW-23B		1325	Water	1	1	1	1	1	1	1		
	MW-25A		1355	Water	1	1	1	1	1	1	1		
	MW-25B		1400	Water	1	1	1	1	1	1	1		
	MW-26A		1300	Water	1	1	1	1	1	1	1		
	MW-26B		1310	Water	1	1	1	1	1	1	1		
	MW-27A		1200	Water	1	1	1	1	1	1	1		
	MW-27B		1210	Water	1	1	1	1	1	1	1		

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System?

☐ YES ☐ NO

Are samples for human consumption/ use?

☐ YES ☐ NO

Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen ☐ SIF Observations Yes ☐ No ☐

Ice Packs ☐ Ice Cubes ☐ Custody seal intact Yes ☐ No ☐

Cooling Initiated ☐

INITIAL COOLER TEMPERATURES °C				FINAL COOLER TEMPERATURES °C			

SHIPMENT RELEASE (client use)

Released by: Date: Time:

INITIAL SHIPMENT RECEPTION (lab use only)

Received by: Date: Time:

FINAL SHIPMENT RECEPTION (lab use only)

Received by: Date: Time:

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

If any water samples are taken from a **Regulated Drinking Water (DW) System**, please submit using an **Authorized DW COC form**.

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

Chain of Custody (COC) / Analytical Request Form

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

Affix ALS barcode label here (lab use only)

COC Number: 17 -

Report To	Contact and company name below will appear on the final report
Company:	Tetra Tech
Contact:	Carl Forkheim
Phone:	403-510-7241
	Company address below will appear on the final report
Street:	Suite 110, 140 Quarry Park Blvd SE
City/Province:	Calgary AB
Postal Code:	T2C 3G3
Invoice To	Same as Report To ☐ YES ☐ NO
	Copy of Invoice with Report ☐ YES ☐ NO
Company:	Clean Harbors
Contact:	

Report Format / Distribution

Select Report Format: ☑ PDF ☐ EXCEL ☑ EDD (DIGITAL)

Quality Control (QC) Report with Report ☑ YES ☐ NO

☐ Compare Results to Criteria on Report - provide details below if box checked

Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax EBA.labdata@tetratech.com

Email 2 ets.svc.eba_esdat@tetratech.com

Email 3 Carl.Forkheim@tetratech.com

Invoice Distribution

Select Invoice Distribution: ☐ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax

Email 2

Select Service Level Below - Contact your AM to confirm all E&P TATs (surcharges may apply)

Regular [R] ☑ Standard TAT if received by 3 pm - business days - no surcharges apply

PRIORITY (Business Days): 4 day [P4-20%] ☐; 3 day [P3-25%] ☐; 2 day [P2-50%] ☐

EMERGENCY: 1 Business day [E - 100%] ☐; Same Day, Weekend or Statutory holiday [E2 -200% (Laboratory opening fees may apply)] ☐

Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm

For tests that can not be performed according to the service level selected, you will be contacted.

Project Information

ALS Account # / Quote #: Q83988

Job #: 704-SWM.SWOP04591-03

PO / AFE:

LSD:

Oil and Gas Required Fields (client use)

AFE/Cost Center: PO#

Major/Minor Code: Routing Code:

Requisitioner:

Location:

ALS Lab Work Order # (lab use only):

ALS Contact: Sampler:

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	Routine Parameters	Dissolved Metals (including Hg)	Nutrients (TKN, Ammonia-N, DOC)	BTEX and F1-F2	Total Phenols	VOC, TCE and PCE	SAMPLES ON HOLD	SUSPECTED HAZARD (see Special Instructions)
	MW-28A	16-Jun-23	1215	Water	9	✓	✓	✓	✓	✓	✓		
	MW-28B	"	1220	Water									
	MW-29A	"	1240	Water									
	MW-29B	"	1245	Water									
	MW-30A	15-Jun-23	1735	Water									
	MW-30B	"	1745	Water									
	MW-31A	16-Jun-23	0910	Water									
	MW-31B	"	0920	Water									
	MW-32A	"	0900	Water									
	MW-32B	"	0850	Water									
	MW-33A	15-Jun-23	1345	"									
	MW-33B	"	1355	"									

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System? ☐ YES ☐ NO

Are samples for human consumption/ use? ☐ YES ☐ NO

Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen ☐ SIF Observations Yes ☐ No ☐

Ice Packs ☐ Ice Cubes ☐ Custody seal intact Yes ☐ No ☐

Cooling Initiated ☐

INITIAL COOLER TEMPERATURES °C | FINAL COOLER TEMPERATURES °C

SHIPMENT RELEASE (client use)

Released by: Date: Time:

INITIAL SHIPMENT RECEPTION (lab use only)

Received by: Date: Time:

FINAL SHIPMENT RECEPTION (lab use only)

Received by: Date: Time:

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

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WHITE - LABORATORY COPY YELLOW - CLIENT COPY

Chain of Custody (COC) / Analytical Request Form

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

Affix ALS barcode label here (lab use only)

COC Number: 17 -

Report To	Contact and company name below will appear on the final report
Company:	Tetra Tech
Contact:	Carl Forkheim
Phone:	403-510-7241
	Company address below will appear on the final report
Street:	Suite 110, 140 Quarry Park Blvd SE
City/Province:	Calgary AB
Postal Code:	T2C 3G3
Invoice To	Same as Report To ☐ YES ☐ NO
	Copy of Invoice with Report ☐ YES ☐ NO
Company:	Clean Harbors
Contact:	

Report Format / Distribution

Select Report Format: ☑ PDF ☐ EXCEL ☑ EDD (DIGITAL)

Quality Control (QC) Report with Report ☑ YES ☐ NO

☐ Compare Results to Criteria on Report - provide details below if box checked

Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax EBA.labdata@tetratech.com

Email 2 ets.svc.eba_esdat@tetratech.com

Email 3 Carl.Forkheim@tetratech.com

Invoice Distribution

Select Invoice Distribution: ☐ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax

Email 2

Select Service Level Below - Contact your AM to confirm all E&P TATs (surcharges may apply)

Regular [R] ☑ Standard TAT if received by 3 pm - business days - no surcharges apply

PRIORITY (Business Days): 4 day [P4-20%] ☐; 3 day [P3-25%] ☐; 2 day [P2-50%] ☐

EMERGENCY: 1 Business day [E - 100%] ☐; Same Day, Weekend or Statutory holiday [E2 -200% (Laboratory opening fees may apply)] ☐

Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm

For tests that can not be performed according to the service level selected, you will be contacted.

Project Information

ALS Account # / Quote #: Q83988

Job #: 704-SWM.SWOP04591-03

PO / AFE:

LSD:

Oil and Gas Required Fields (client use)

AFE/Cost Center: PO#

Major/Minor Code: Routing Code:

Requisitioner:

Location:

ALS Lab Work Order # (lab use only):

ALS Contact: Sampler:

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	Routine Parameters	Dissolved Metals (including Hg)	Nutrients (TKN, Ammonia-N, DOC)	BTEX and F1-F2	Total Phenols	VOC, TCE and PCE	Total metal (Hg)	SAMPLES ON HOLD	SUSPECTED HAZARD (see Special Instructions)
	MW-35-Deep	Jun-16-23	10:20	Water	4	✓	✓	✓	✓	✓	✓			
	MW-35A	Jun-16-23	1030	Water	6	✓	✓	✓	✓	✓	✓	✓		
	MW-35B		1040	Water	9	✓	✓	✓	✓	✓	✓	✓		
	MW-35C			Water										
	MW-36 Deep		0945	Water										
	MW-36A		0945	Water										
	DUP A			Water										
	DUP B			Water										
	DUP C		-	Water										
	DUP D			Water										
	Trip Blank			"										
	Field Blank			"										

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System? ☐ YES ☐ NO

Are samples for human consumption/ use? ☐ YES ☐ NO

Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)

MW35A -> Not filtered not enough water to fill all bottles.

~~15MW36-Deep and 15MW35-Deep - Not Filtered/preserved~~

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen ☐ SIF Observations Yes ☐ No ☐

Ice Packs ☐ Ice Cubes ☑ Custody seal intact Yes ☐ No ☐

Cooling Initiated ☐

INITIAL COOLER TEMPERATURES °C	FINAL COOLER TEMPERATURES °C
4.6, 6.4, 11.1	

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date:	Time:	Received by:	Date:	Time:	Received by:	Date:	Time:
				16/6/23	4:35			

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

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1. If any water samples are taken from a **Regulated Drinking Water (DW) System**, please submit using an **Authorized DW COC form**.

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CERTIFICATE OF ANALYSIS

Work Order	: **EO2310009**	Page	: 1 of 3
Client	: **Tetra Tech Canada Inc.**	Laboratory	: ALS Environmental - Edmonton
Contact	: William Wood	Account Manager	: Kieran Tordoff
Address	: North Building 14940 123 Ave NW Edmonton AB Canada T5V 1B4	Address	: 9450 - 17 Avenue NW Edmonton AB Canada T6N 1M9
Telephone	: 587-986-2709	Telephone	: +1 780 413 5227
Project	: 704-SWM.SWOP04591-03	Date Samples Received	: 30-Oct-2023 08:00
PO	: 704-SWM.SWOP04591-03	Date Analysis Commenced	: 30-Oct-2023
C-O-C number	: ----	Issue Date	: 31-Oct-2023 16:12
Sampler	: RDO		
Site	: ----		
Quote number	: Edmonton General - 2023 AB/SK Pricelist		
No. of samples received	: 1		
No. of samples analysed	: 1		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	*Position*	*Laboratory Department*
Alex Drake	Lab Analyst	Inorganics, Edmonton, Alberta

General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.
Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances
LOR: Limit of Reporting (detection limit).

Unit	*Description*
mg/L	milligrams per litre

<: less than.

>: greater than.

Surrogate: An analyte that is similar in behavior to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Qualifiers

Qualifier	*Description*
DLDS	*Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.*

Analytical Results

Sub-Matrix: **Water** (Matrix: **Water**)				*Client sample ID*	**MW27B**	----	----	----	----
				Client sampling date / time	29-Oct-2023 12:07	----	----	----	----
Analyte	*CAS Number*	*Method/Lab*	*LOR*	*Unit*	**EO2310009-001**	--------	--------	--------	--------
					Result	----	----	----	----
Anions and Nutrients									
Chloride	16887-00-6	E235.Cl/EO	0.50	mg/L	164 DLDS	----	----	----	----

Please refer to the General Comments section for an explanation of any result qualifiers detected.

Please refer to the Accreditation section for an explanation of analyte accreditations.

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QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **EO2310009**	Page	: 1 of 5
Client	: **Tetra Tech Canada Inc.**	Laboratory	: ALS Environmental - Edmonton
Contact	: William Wood	Account Manager	: Kieran Tordoff
Address	: North Building 14940 123 Ave NW Edmonton AB Canada T5V 1B4	Address	: 9450 - 17 Avenue NW Edmonton, Alberta Canada T6N 1M9
Telephone	: 587-986-2709	Telephone	: +1 780 413 5227
Project	: 704-SWM.SWOP04591-03	Date Samples Received	: 30-Oct-2023 08:00
PO	: 704-SWM.SWOP04591-03	Issue Date	: 31-Oct-2023 16:12
C-O-C number	: ----		
Sampler	: RDO		
Site	: ----		
Quote number	: Edmonton General - 2023 AB/SK Pricelist		
No. of samples received	: 1		
No. of samples analysed	: 1		

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

Key

Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number: Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO: Data Quality Objective.
LOR: Limit of Reporting (detection limit).
RPD: Relative Percent Difference.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- No Analysis Holding Time Outliers exist.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.

Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Chloride in Water by IC										
HDPE										
MW27B	E235.Cl	29-Oct-2023	30-Oct-2023	28 days	1 days	✓	30-Oct-2023	28 days	1 days	✓

Legend & Qualifier Definitions

Rec. HT: ALS recommended hold time (see units).

Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Water**

Evaluation: × = *QC frequency outside specification*; ✓ = *QC frequency within specification.*

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Duplicates (DUP)							
Chloride in Water by IC	E235.Cl	1214115	1	18	5.5	5.0	✓
Laboratory Control Samples (LCS)							
Chloride in Water by IC	E235.Cl	1214115	1	18	5.5	5.0	✓
Method Blanks (MB)							
Chloride in Water by IC	E235.Cl	1214115	1	18	5.5	5.0	✓
Matrix Spikes (MS)							
Chloride in Water by IC	E235.Cl	1214115	1	18	5.5	5.0	✓

Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by “mod”).

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Chloride in Water by IC	E235.Cl ALS Environmental - Edmonton	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

ALS Canada Ltd.

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QUALITY CONTROL REPORT

Work Order	: **EO2310009**	Page	: 1 of 3
Client	: Tetra Tech Canada Inc.	Laboratory	: ALS Environmental - Edmonton
Contact	: William Wood	Account Manager	: Kieran Tordoff
Address	: North Building 14940 123 Ave NW Edmonton AB Canada T5V 1B4	Address	: 9450 - 17 Avenue NW Edmonton, Alberta Canada T6N 1M9
Telephone	:	Telephone	: +1 780 413 5227
Project	: 704-SWM.SWOP04591-03	Date Samples Received	: 30-Oct-2023 08:00
PO	: 704-SWM.SWOP04591-03	Date Analysis Commenced	: 30-Oct-2023
C-O-C number	: ----	Issue Date	: 31-Oct-2023 16:12
Sampler	: RDO 587-986-2709		
Site	: ----		
Quote number	: Edmonton General - 2023 AB/SK Pricelist		
No. of samples received	: 1		
No. of samples analysed	: 1		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percent Difference (RPD) and Data Quality Objectives
- Matrix Spike (MS) Report; Recovery and Data Quality Objectives
- Method Blank (MB) Report; Recovery and Data Quality Objectives
- Laboratory Control Sample (LCS) Report; Recovery and Data Quality Objectives

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	*Position*	*Laboratory Department*
Alex Drake	Lab Analyst	Edmonton Inorganics, Edmonton, Alberta

General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number = Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO = Data Quality Objective.
LOR = Limit of Reporting (detection limit).
RPD = Relative Percent Difference
# = Indicates a QC result that did not meet the ALS DQO.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test-specific).

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Anions and Nutrients (QC Lot: 1214115)											
EO2309991-007	Anonymous	Chloride	16887-00-6	E235.Cl	0.50	mg/L	<0.50	<0.50	0	Diff <2x LOR	----

Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: **Water**

Analyte	*CAS Number*	*Method*	*LOR*	*Unit*	*Result*	*Qualifier*
Anions and Nutrients (QCLot: 1214115)						
Chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----

Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Anions and Nutrients (QCLot: 1214115)									
Chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	96.2	90.0	110	----

Matrix Spike (MS) Report

A Matrix Spike (MS) is a randomly selected intra-laboratory replicate sample that has been fortified (spiked) with test analytes at known concentration, and processed in an identical manner to test samples. Matrix Spikes provide information regarding analyte recovery and potential matrix effects. MS DQO exceedances due to sample matrix may sometimes be unavoidable; in such cases, test results for the associated sample (or similar samples) may be subject to bias. ND – Recovery not determined, background level >= 1x spike level.

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Anions and Nutrients (QCLot: 1214115)										
EO2309991-007	Anonymous	Chloride	16887-00-6	E235.Cl	95.8 mg/L	100 mg/L	95.8	75.0	125	----

Chain of Custody (COC) / Analytical Request Form

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

Affix ALS barcode label here (lab use only)

COC Number: 17 -

Page 1 of 1

Report To	Contact and company name below will appear on the final report
Company:	Tetra Tech
Contact:	William Wood
Phone:	587-986-2709
	Company address below will appear on the final report
Street:	Suite 110, 140 Quarry Park Blvd SE
City/Province:	Calgary AB
Postal Code:	T2C 3G3
Invoice To	Same as Report To ☑ YES ☐ NO
	Copy of Invoice with Report ☑ YES ☐ NO
Company:	Clean Harbors
Contact:	

Report Format / Distribution

Select Report Format: ☑ PDF ☐ EXCEL ☑ EDD (DIGITAL)

Quality Control (QC) Report with Report ☑ YES ☐ NO

☐ Compare Results to Criteria on Report - provide details below if box checked

Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax EBA.labdata@tetratech.com

Email 2 ets.svc.eba_esdat@tetratech.com

Email 3 William.Wood@tetratech.com

Invoice Distribution

Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax William.Wood@tetratech.com

Email 2

Select Service Level Below - Contact your AM to confirm all E&P TATs (surcharges may apply)

Regular [R] ☑ Standard TAT if received by 3 pm - business days - no surcharges apply

PRIORITY (Business Days): 4 day [P4-20%] ☐ 3 day [P3-25%] ☐ 2 day [P2-50%] ☐

EMERGENCY: 1 Business day [E - 100%] ☐ Same Day, Weekend or Statutory holiday [E2 -200% (Laboratory opening fees may apply)] ☐

Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm

For tests that can not be performed according to the service level selected, you will be contacted.

Project Information

ALS Account # / Quote #:	EO23-EBAE100-006
Job #:	704-SWM.SWOP04591-03
PO / AFE:	704-SWM.SWOP04591-03
LSD:	

Oil and Gas Required Fields (client use)

AFE/Cost Center:	PO#
Major/Minor Code:	Routing Code:
Requisitioner:	
Location:	

ALS Lab Work Order # (lab use only): EO2310009

ALS Contact: William Wood Sampler: RDO

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	Chloride												SAMPLES ON HOLD	SUSPECTED HAZARD (see Special Instructions)
	MW27B	29/OCT/23	12:07	Water	1	R													
				~~Water~~															
				~~Water~~															
				~~Water~~															
				~~Water~~															
				~~Water~~															
				~~Water~~															
				~~Water~~															
				~~Water~~															
				~~Water~~															
				~~Water~~															
				~~Water~~															

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System? ☐ YES ☑ NO

Are samples for human consumption/ use? ☐ YES ☑ NO

Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)

SAMPLE C

Frozen ☐ Ice Packs ☐ Ice Cubes ☐ Cooling Initiated ☐

INITIAL COOLER TEMPERATURE

7.2

SHIPMENT RELEASE (client use)

Released by: RDO Date: 29/OCT/23 Time:

INITIAL SHIPMENT RECEPTION (lab use only)

Received by: Rm Date: 10/30/23 Time: 8AM

FINA

Received by: Time:

Environmental Division Edmonton

Work Order Reference

EO2310009

Telephone : +1 780 413 5227

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

NOV 2018 FRONT

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a **Regulated Drinking Water (DW) System**, please submit using an **Authorized DW COC form**.

ALS Canada Ltd.

right solutions. right partner.

CERTIFICATE OF ANALYSIS

Work Order	: **EO2311630**	Page	: 1 of 8
Client	: **Tetra Tech Canada Inc.**	Laboratory	: ALS Environmental - Edmonton
Contact	: William Wood	Account Manager	: Kieran Tordoff
Address	: North Building 14940 123 Ave NW Edmonton AB Canada T5V 1B4	Address	: 9450 - 17 Avenue NW Edmonton AB Canada T6N 1M9
Telephone	: 587-986-2709	Telephone	: +1 780 413 5227
Project	: SWM.SWOP04591-02	Date Samples Received	: 21-Dec-2023 12:50
PO	: ----	Date Analysis Commenced	: 21-Dec-2023
C-O-C number	: ----	Issue Date	: 30-Dec-2023 14:07
Sampler	: WW		
Site	: ----		
Quote number	: EO23-EBAE100-006 (Q83988)		
No. of samples received	: 2		
No. of samples analysed	: 2		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	*Position*	*Laboratory Department*
Brayden Ginther	Laboratory Analyst	Metals, Edmonton, Alberta
Daniel Nguyen	Lab Assistant	Metals, Edmonton, Alberta
Jing Liu	Lab Assistant	Inorganics, Edmonton, Alberta
Kari Mulroy	Lab Supervisor - Environmental	Organics, Edmonton, Alberta
Logan Carroll	Laboratory Analyst	Inorganics, Edmonton, Alberta
Shruti Mudliar	Lab Analyst	Inorganics, Edmonton, Alberta
Shruti Mudliar	Lab Analyst	Metals, Edmonton, Alberta
Yan Zhang	Lab Analyst	Organics, Edmonton, Alberta

General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances
LOR: Limit of Reporting (detection limit).

Unit	*Description*
-	no units
%	percent
µg/L	micrograms per litre
µS/cm	microsiemens per centimetre
mg/L	milligrams per litre
pH units	pH units

<: less than.

>: greater than.

Surrogate: An analyte that is similar in behavior to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED on SRN or QCI Report, ALS SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Qualifiers

Qualifier	*Description*
DLDS	*Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.*
SFP	*Sample was filtered and preserved at the laboratory.*

Analytical Results

Sub-Matrix: Water (Matrix: Water)				Client sample ID	23MW38A	23MW38B	----	----	----
				Client sampling date / time	21-Dec-2023 10:30	21-Dec-2023 10:13	----	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit	EO2311630-001	EO2311630-002	--------	--------	--------
					Result	Result	----	----	----
Physical Tests									
Alkalinity, bicarbonate (as HCO3)	71-52-3	E290/EO	1.0	mg/L	1060	1250	----	----	----
Alkalinity, carbonate (as CO3)	3812-32-6	E290/EO	1.0	mg/L	34.1	<1.0	----	----	----
Alkalinity, hydroxide (as OH)	14280-30-9	E290/EO	1.0	mg/L	<1.0	<1.0	----	----	----
Alkalinity, total (as CaCO3)	----	E290/EO	1.0	mg/L	926	1020	----	----	----
Conductivity	----	E100/EO	1.0	µS/cm	1780	8960	----	----	----
Hardness (as CaCO3), dissolved	----	EC100/EO	0.50	mg/L	38.8	734	----	----	----
pH	----	E108/EO	0.10	pH units	8.67	8.03	----	----	----
Solids, total dissolved [TDS], calculated	----	EC103/EO	1.0	mg/L	1260	8290	----	----	----
Anions and Nutrients									
Ammonia, total (as N)	7664-41-7	E298/EO	0.0050	mg/L	0.706	1.10	----	----	----
Chloride	16887-00-6	E235.Cl/EO	0.50	mg/L	21.3 DLDS	5.55 DLDS	----	----	----
Fluoride	16984-48-8	E235.F/EO	0.020	mg/L	1.34 DLDS	0.338 DLDS	----	----	----
Kjeldahl nitrogen, total [TKN]	----	E318/EO	0.050	mg/L	1.21	1.57	----	----	----
Nitrate (as N)	14797-55-8	E235.NO3/EO	0.020	mg/L	0.125 DLDS	<0.200 DLDS	----	----	----
Nitrate + Nitrite (as N)	----	EC235.N+N/EO	0.0032	mg/L	0.125	<0.224	----	----	----
Nitrite (as N)	14797-65-0	E235.NO2/EO	0.010	mg/L	<0.050 DLDS	<0.100 DLDS	----	----	----
Sulfate (as SO4)	14808-79-8	E235.SO4/EO	0.30	mg/L	133 DLDS	4720 DLDS	----	----	----
Organic / Inorganic Carbon									
Carbon, dissolved organic [DOC]	----	E358-L/EO	0.50	mg/L	25.2 SFP	12.6	----	----	----
Ion Balance									
Ion balance (cations/anions)	----	EC101/EO	0.010	%	103	110	----	----	----
Dissolved Metals									
Aluminum, dissolved	7429-90-5	E421/EO	0.0010	mg/L	0.0192	<0.0050 DLDS	----	----	----
Antimony, dissolved	7440-36-0	E421/EO	0.00010	mg/L	0.00059	<0.00050 DLDS	----	----	----
Arsenic, dissolved	7440-38-2	E421/EO	0.00010	mg/L	0.00354	0.00204	----	----	----
Barium, dissolved	7440-39-3	E421/EO	0.00010	mg/L	0.0811	0.0484	----	----	----
Beryllium, dissolved	7440-41-7	E421/EO	0.000020	mg/L	<0.000020	<0.000100 DLDS	----	----	----
Bismuth, dissolved	7440-69-9	E421/EO	0.000050	mg/L	<0.000050	<0.000250 DLDS	----	----	----

Analytical Results

Sub-Matrix: Water (Matrix: Water)				Client sample ID	23MW38A	23MW38B	----	----	----
				Client sampling date / time	21-Dec-2023 10:30	21-Dec-2023 10:13	----	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit	EO2311630-001	EO2311630-002	--------	--------	--------
					Result	Result	----	----	----
Dissolved Metals									
Boron, dissolved	7440-42-8	E421/EO	0.010	mg/L	0.786	0.431	----	----	----
Cadmium, dissolved	7440-43-9	E421/EO	0.0000050	mg/L	<0.0000050	0.0000306	----	----	----
Calcium, dissolved	7440-70-2	E421/EO	0.050	mg/L	11.3	153	----	----	----
Cesium, dissolved	7440-46-2	E421/EO	0.000010	mg/L	0.000038	0.000101	----	----	----
Chromium, dissolved	7440-47-3	E421/EO	0.00050	mg/L	<0.00050	<0.00250 DLDS	----	----	----
Cobalt, dissolved	7440-48-4	E421/EO	0.00010	mg/L	0.00068	0.00296	----	----	----
Copper, dissolved	7440-50-8	E421/EO	0.00020	mg/L	0.00114	<0.00100 DLDS	----	----	----
Iron, dissolved	7439-89-6	E421/EO	0.010	mg/L	0.014	<0.050 DLDS	----	----	----
Lead, dissolved	7439-92-1	E421/EO	0.000050	mg/L	<0.000050	<0.000250 DLDS	----	----	----
Lithium, dissolved	7439-93-2	E421/EO	0.0010	mg/L	0.0835	0.437	----	----	----
Magnesium, dissolved	7439-95-4	E421/EO	0.0050	mg/L	2.57	85.6	----	----	----
Manganese, dissolved	7439-96-5	E421/EO	0.00010	mg/L	0.00706	0.453	----	----	----
Mercury, dissolved	7439-97-6	E509/EO	0.0000050	mg/L	<0.0000050	<0.0000050	----	----	----
Molybdenum, dissolved	7439-98-7	E421/EO	0.000050	mg/L	0.0136	0.00312	----	----	----
Nickel, dissolved	7440-02-0	E421/EO	0.00050	mg/L	0.00382	0.00532	----	----	----
Phosphorus, dissolved	7723-14-0	E421/EO	0.050	mg/L	0.146	<0.250 DLDS	----	----	----
Potassium, dissolved	7440-09-7	E421/EO	0.050	mg/L	3.74	18.1	----	----	----
Rubidium, dissolved	7440-17-7	E421/EO	0.00020	mg/L	0.00365	0.0134	----	----	----
Selenium, dissolved	7782-49-2	E421/EO	0.000050	mg/L	0.00153	0.000511	----	----	----
Silicon, dissolved	7440-21-3	E421/EO	0.050	mg/L	4.14	6.33	----	----	----
Silver, dissolved	7440-22-4	E421/EO	0.000010	mg/L	<0.000010	<0.000050 DLDS	----	----	----
Sodium, dissolved	7440-23-5	E421/EO	0.050	mg/L	499	2660	----	----	----
Strontium, dissolved	7440-24-6	E421/EO	0.00020	mg/L	0.124	2.85	----	----	----
Sulfur, dissolved	7704-34-9	E421/EO	0.50	mg/L	50.4	1870	----	----	----
Tellurium, dissolved	13494-80-9	E421/EO	0.00020	mg/L	<0.00020	<0.00100 DLDS	----	----	----
Thallium, dissolved	7440-28-0	E421/EO	0.000010	mg/L	0.000011	0.000076	----	----	----
Thorium, dissolved	7440-29-1	E421/EO	0.00010	mg/L	<0.00010	<0.00050 DLDS	----	----	----
Tin, dissolved	7440-31-5	E421/EO	0.00010	mg/L	0.00047	<0.00050 DLDS	----	----	----
Titanium, dissolved	7440-32-6	E421/EO	0.00030	mg/L	0.00055	<0.00150 DLDS	----	----	----
Tungsten, dissolved	7440-33-7	E421/EO	0.00010	mg/L	0.00050	<0.00050 DLDS	----	----	----

Analytical Results

Sub-Matrix: Water (Matrix: Water)				Client sample ID	23MW38A	23MW38B	----	----	----
				Client sampling date / time	21-Dec-2023 10:30	21-Dec-2023 10:13	----	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit	EO2311630-001	EO2311630-002	--------	--------	--------
					Result	Result	----	----	----
Dissolved Metals									
Uranium, dissolved	7440-61-1	E421/EO	0.000010	mg/L	0.00218	0.00989	----	----	----
Vanadium, dissolved	7440-62-2	E421/EO	0.00050	mg/L	0.00174	<0.00250 DLDS	----	----	----
Zinc, dissolved	7440-66-6	E421/EO	0.0010	mg/L	<0.0010	<0.0050 DLDS	----	----	----
Zirconium, dissolved	7440-67-7	E421/EO	0.00020	mg/L	0.00185	0.00227	----	----	----
Dissolved mercury filtration location	----	EP509/EO	-	-	Laboratory	Laboratory	----	----	----
Dissolved metals filtration location	----	EP421/EO	-	-	Field	Field	----	----	----
Aggregate Organics									
Phenols, total (4AAP)	----	E562/EO	0.0010	mg/L	<0.0010	<0.0010	----	----	----
Volatile Organic Compounds									
Benzene	71-43-2	E611E/EO	0.50	µg/L	<0.50	<0.50	----	----	----
Benzene	71-43-2	E611A/EO	0.00050	mg/L	<0.00050	<0.00050	----	----	----
Bromobenzene	108-86-1	E611E/EO	1.0	µg/L	<1.0	<1.0	----	----	----
Bromochloromethane	74-97-5	E611E/EO	1.0	µg/L	<1.0	<1.0	----	----	----
Bromodichloromethane	75-27-4	E611E/EO	1.0	µg/L	<1.0	<1.0	----	----	----
Bromoform	75-25-2	E611E/EO	1.0	µg/L	<1.0	<1.0	----	----	----
Bromomethane	74-83-9	E611E/EO	1.0	µg/L	<1.0	<1.0	----	----	----
Butylbenzene, n-	104-51-8	E611E/EO	1.0	µg/L	<1.0	<1.0	----	----	----
Butylbenzene, sec-	135-98-8	E611E/EO	1.0	µg/L	<1.0	<1.0	----	----	----
Butylbenzene, tert-	98-06-6	E611E/EO	1.0	µg/L	<1.0	<1.0	----	----	----
Carbon tetrachloride	56-23-5	E611E/EO	0.50	µg/L	<0.50	<0.50	----	----	----
Chlorobenzene	108-90-7	E611E/EO	1.0	µg/L	<1.0	<1.0	----	----	----
Chloroethane	75-00-3	E611E/EO	1.0	µg/L	<1.0	<1.0	----	----	----
Chloroform	67-66-3	E611E/EO	1.0	µg/L	<1.0	<1.0	----	----	----
Chloromethane	74-87-3	E611E/EO	5.0	µg/L	<5.0	<5.0	----	----	----
Chlorotoluene, 2-	95-49-8	E611E/EO	1.0	µg/L	<1.0	<1.0	----	----	----
Chlorotoluene, 4-	106-43-4	E611E/EO	1.0	µg/L	<1.0	<1.0	----	----	----
Cymene, p-	99-87-6	E611E/EO	1.0	µg/L	<1.0	<1.0	----	----	----
Dibromo-3-chloropropane, 1,2-	96-12-8	E611E/EO	1.0	µg/L	<1.0	<1.0	----	----	----
Dibromochloromethane	124-48-1	E611E/EO	1.0	µg/L	<1.0	<1.0	----	----	----
Dibromoethane, 1,2-	106-93-4	E611E/EO	1.0	µg/L	<1.0	<1.0	----	----	----

Analytical Results

Sub-Matrix: Water (Matrix: Water)				Client sample ID	23MW38A	23MW38B	----	----	----
				Client sampling date / time	21-Dec-2023 10:30	21-Dec-2023 10:13	----	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit	EO2311630-001	EO2311630-002	--------	--------	--------
					Result	Result	----	----	----
Volatile Organic Compounds									
Dibromomethane	74-95-3	E611E/EO	1.0	µg/L	<1.0	<1.0	----	----	----
Dichlorobenzene, 1,2-	95-50-1	E611E/EO	0.50	µg/L	<0.50	<0.50	----	----	----
Dichlorobenzene, 1,3-	541-73-1	E611E/EO	1.0	µg/L	<1.0	<1.0	----	----	----
Dichlorobenzene, 1,4-	106-46-7	E611E/EO	1.0	µg/L	<1.0	<1.0	----	----	----
Dichlorodifluoromethane	75-71-8	E611E/EO	1.0	µg/L	<1.0	<1.0	----	----	----
Dichloroethane, 1,1-	75-34-3	E611E/EO	1.0	µg/L	<1.0	<1.0	----	----	----
Dichloroethane, 1,2-	107-06-2	E611E/EO	1.0	µg/L	<1.0	<1.0	----	----	----
Dichloroethylene, 1,1-	75-35-4	E611E/EO	1.0	µg/L	<1.0	<1.0	----	----	----
Dichloroethylene, cis-1,2-	156-59-2	E611E/EO	1.0	µg/L	<1.0	<1.0	----	----	----
Dichloroethylene, trans-1,2-	156-60-5	E611E/EO	1.0	µg/L	<1.0	<1.0	----	----	----
Dichloromethane	75-09-2	E611E/EO	1.0	µg/L	<1.0	<1.0	----	----	----
Dichloropropane, 1,2-	78-87-5	E611E/EO	1.0	µg/L	<1.0	<1.0	----	----	----
Dichloropropane, 1,3-	142-28-9	E611E/EO	1.0	µg/L	<1.0	<1.0	----	----	----
Dichloropropane, 2,2-	594-20-7	E611E/EO	1.0	µg/L	<1.0	<1.0	----	----	----
Dichloropropylene, 1,1-	563-58-6	E611E/EO	1.0	µg/L	<1.0	<1.0	----	----	----
Dichloropropylene, cis+trans-1,3-	542-75-6	E611E/EO	1.5	µg/L	<1.5	<1.5	----	----	----
Dichloropropylene, cis-1,3-	10061-01-5	E611E/EO	1.0	µg/L	<1.0	<1.0	----	----	----
Dichloropropylene, trans-1,3-	10061-02-6	E611E/EO	1.0	µg/L	<1.0	<1.0	----	----	----
Ethylbenzene	100-41-4	E611E/EO	0.50	µg/L	<0.50	<0.50	----	----	----
Ethylbenzene	100-41-4	E611A/EO	0.00050	mg/L	<0.00050	<0.00050	----	----	----
Hexachlorobutadiene	87-68-3	E611E/EO	1.0	µg/L	<1.0	<1.0	----	----	----
Isopropylbenzene	98-82-8	E611E/EO	1.0	µg/L	<1.0	<1.0	----	----	----
Methyl-tert-butyl ether [MTBE]	1634-04-4	E611E/EO	0.50	µg/L	<0.50	<0.50	----	----	----
Propylbenzene, n-	103-65-1	E611E/EO	1.0	µg/L	<1.0	<1.0	----	----	----
Styrene	100-42-5	E611E/EO	0.50	µg/L	<0.50	<0.50	----	----	----
Styrene	100-42-5	E611A/EO	0.00050	mg/L	<0.00050	<0.00050	----	----	----
Tetrachloroethane, 1,1,1,2-	630-20-6	E611E/EO	1.0	µg/L	<1.0	<1.0	----	----	----
Tetrachloroethane, 1,1,2,2-	79-34-5	E611E/EO	1.0	µg/L	<1.0	<1.0	----	----	----
Tetrachloroethylene	127-18-4	E611E/EO	1.0	µg/L	<1.0	<1.0	----	----	----
Toluene	108-88-3	E611E/EO	0.50	µg/L	<0.50	<0.50	----	----	----

Analytical Results

Sub-Matrix: Water (Matrix: Water)				Client sample ID	23MW38A	23MW38B	----	----	----
				Client sampling date / time	21-Dec-2023 10:30	21-Dec-2023 10:13	----	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit	EO2311630-001	EO2311630-002	--------	--------	--------
					Result	Result	----	----	----
Volatile Organic Compounds									
Toluene	108-88-3	E611A/EO	0.00050	mg/L	<0.00050	<0.00050	----	----	----
Trichlorobenzene, 1,2,3-	87-61-6	E611E/EO	1.0	µg/L	<1.0	<1.0	----	----	----
Trichlorobenzene, 1,2,4-	120-82-1	E611E/EO	1.0	µg/L	<1.0	<1.0	----	----	----
Trichloroethane, 1,1,1-	71-55-6	E611E/EO	1.0	µg/L	<1.0	<1.0	----	----	----
Trichloroethane, 1,1,2-	79-00-5	E611E/EO	1.0	µg/L	<1.0	<1.0	----	----	----
Trichloroethylene	79-01-6	E611E/EO	1.0	µg/L	<1.0	<1.0	----	----	----
Trichlorofluoromethane	75-69-4	E611E/EO	1.0	µg/L	<1.0	<1.0	----	----	----
Trichloropropane, 1,2,3-	96-18-4	E611E/EO	1.0	µg/L	<1.0	<1.0	----	----	----
Trimethylbenzene, 1,2,4-	95-63-6	E611E/EO	1.0	µg/L	<1.0	<1.0	----	----	----
Trimethylbenzene, 1,3,5-	108-67-8	E611E/EO	1.0	µg/L	<1.0	<1.0	----	----	----
Vinyl chloride	75-01-4	E611E/EO	1.0	µg/L	<1.0	<1.0	----	----	----
Xylene, m+p-	179601-23-1	E611E/EO	0.40	µg/L	<0.40	<0.40	----	----	----
Xylene, m+p-	179601-23-1	E611A/EO	0.00040	mg/L	<0.00040	<0.00040	----	----	----
Xylene, o-	95-47-6	E611E/EO	0.30	µg/L	<0.30	<0.30	----	----	----
Xylene, o-	95-47-6	E611A/EO	0.00030	mg/L	<0.00030	<0.00030	----	----	----
Xylenes, total	1330-20-7	E611E/EO	0.50	µg/L	<0.50	<0.50	----	----	----
Xylenes, total	1330-20-7	E611A/EO	0.00050	mg/L	<0.00050	<0.00050	----	----	----
BTEX, total	----	E611E/EO	1.0	µg/L	<1.0	<1.0	----	----	----
Trihalomethanes [THMs], total	----	E611E/EO	2.0	µg/L	<2.0	<2.0	----	----	----
Hydrocarbons									
F1 (C6-C10)	----	E581.F1/EO	0.10	mg/L	<0.10	<0.10	----	----	----
F2 (C10-C16)	----	E601/EO	0.10	mg/L	<0.10	<0.10	----	----	----
F1-BTEX	----	EC580/EO	0.100	mg/L	<0.100	<0.100	----	----	----
Hydrocarbons Surrogates									
Bromobenzotrifluoride, 2- (F2-F4 surrogate)	392-83-6	E601/EO	1.0	%	104	106	----	----	----
Dichlorotoluene, 3,4-	95-75-0	E581.F1/EO	1.0	%	93.7	95.6	----	----	----
Volatile Organic Compounds Surrogates									
Bromofluorobenzene, 4-	460-00-4	E611A/EO	1.0	%	73.1	79.9	----	----	----
Bromofluorobenzene, 4-	460-00-4	E611E/EO	1.0	%	73.1	79.9	----	----	----
Difluorobenzene, 1,4-	540-36-3	E611A/EO	1.0	%	92.5	89.3	----	----	----

Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	23MW38A	23MW38B	----	----	----
					Client sampling date / time	21-Dec-2023 10:30	21-Dec-2023 10:13	----	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit		EO2311630-001	EO2311630-002	--------	--------	--------
						Result	Result	----	----	----
Volatile Organic Compounds Surrogates										
Difluorobenzene, 1,4-	540-36-3	E611E/EO	1.0	%		92.5	89.3	----	----	----

Please refer to the General Comments section for an explanation of any result qualifiers detected.

Please refer to the Accreditation section for an explanation of analyte accreditations.

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QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **EO2311630**	Page	: 1 of 13
Client	: **Tetra Tech Canada Inc.**	Laboratory	: ALS Environmental - Edmonton
Contact	: William Wood	Account Manager	: Kieran Tordoff
Address	: North Building 14940 123 Ave NW Edmonton AB Canada T5V 1B4	Address	: 9450 - 17 Avenue NW Edmonton, Alberta Canada T6N 1M9
Telephone	: 587-986-2709	Telephone	: +1 780 413 5227
Project	: SWM.SWOP04591-02	Date Samples Received	: 21-Dec-2023 12:50
PO	: ----	Issue Date	: 30-Dec-2023 14:07
C-O-C number	: ----		
Sampler	: WW		
Site	: ----		
Quote number	: EO23-EBAE100-006 (Q83988)		
No. of samples received	: 2		
No. of samples analysed	: 2		

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

Key

Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number: Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO: Data Quality Objective.
LOR: Limit of Reporting (detection limit).
RPD: Relative Percent Difference.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- Analysis Holding Time Outliers exist - please see following pages for full details.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.

Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid) 23MW38A	E562	21-Dec-2023	30-Dec-2023	28 days	9 days	✓	30-Dec-2023	28 days	9 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid) 23MW38B	E562	21-Dec-2023	30-Dec-2023	28 days	9 days	✓	30-Dec-2023	28 days	9 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) 23MW38A	E298	21-Dec-2023	21-Dec-2023	28 days	0 days	✓	21-Dec-2023	28 days	0 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) 23MW38B	E298	21-Dec-2023	21-Dec-2023	28 days	0 days	✓	21-Dec-2023	28 days	0 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE 23MW38A	E235.Cl	21-Dec-2023	21-Dec-2023	28 days	0 days	✓	21-Dec-2023	28 days	0 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE 23MW38B	E235.Cl	21-Dec-2023	21-Dec-2023	28 days	0 days	✓	21-Dec-2023	28 days	0 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE 23MW38A	E235.F	21-Dec-2023	21-Dec-2023	28 days	0 days	✓	21-Dec-2023	28 days	0 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Fluoride in Water by IC										
HDPE 23MW38B	E235.F	21-Dec-2023	21-Dec-2023	28 days	0 days	✓	21-Dec-2023	28 days	0 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE 23MW38A	E235.NO3	21-Dec-2023	21-Dec-2023	3 days	0 days	✓	21-Dec-2023	3 days	0 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE 23MW38B	E235.NO3	21-Dec-2023	21-Dec-2023	3 days	0 days	✓	21-Dec-2023	3 days	0 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE 23MW38A	E235.NO2	21-Dec-2023	21-Dec-2023	3 days	0 days	✓	21-Dec-2023	3 days	0 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE 23MW38B	E235.NO2	21-Dec-2023	21-Dec-2023	3 days	0 days	✓	21-Dec-2023	3 days	0 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE 23MW38A	E235.SO4	21-Dec-2023	21-Dec-2023	28 days	0 days	✓	21-Dec-2023	28 days	0 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE 23MW38B	E235.SO4	21-Dec-2023	21-Dec-2023	28 days	0 days	✓	21-Dec-2023	28 days	0 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) 23MW38A	E318	21-Dec-2023	28-Dec-2023	28 days	7 days	✓	28-Dec-2023	28 days	7 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) 23MW38B	E318	21-Dec-2023	28-Dec-2023	28 days	7 days	✓	28-Dec-2023	28 days	7 days	✓

Matrix: **Water**

Evaluation: ✗ = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times: Rec	Holding Times: Actual	Eval	Analysis: Analysis Date	Holding Times: Rec	Holding Times: Actual	Eval
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
HDPE - dissolved (lab preserved) 23MW38A	E509	21-Dec-2023	23-Dec-2023	0 hrs	47 hrs	✗ UCP	23-Dec-2023	0 hrs	47 hrs	✗ UCP
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
HDPE - dissolved (lab preserved) 23MW38B	E509	21-Dec-2023	23-Dec-2023	0 hrs	47 hrs	✗ UCP	23-Dec-2023	0 hrs	47 hrs	✗ UCP
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved) 23MW38A	E421	21-Dec-2023	22-Dec-2023	180 days	1 days	✓	22-Dec-2023	180 days	1 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved) 23MW38B	E421	21-Dec-2023	22-Dec-2023	180 days	1 days	✓	22-Dec-2023	180 days	1 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) 23MW38A	E581.F1	21-Dec-2023	27-Dec-2023	14 days	6 days	✓	27-Dec-2023	14 days	6 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) 23MW38B	E581.F1	21-Dec-2023	27-Dec-2023	14 days	6 days	✓	27-Dec-2023	14 days	6 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) 23MW38A	E601	21-Dec-2023	23-Dec-2023	14 days	2 days	✓	23-Dec-2023	40 days	0 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) 23MW38B	E601	21-Dec-2023	23-Dec-2023	14 days	2 days	✓	23-Dec-2023	40 days	0 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) 23MW38A	E358-L	21-Dec-2023	22-Dec-2023	28 days	1 days	✓	22-Dec-2023	28 days	1 days	✓

Matrix: **Water**

Evaluation: ✖ = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid)										
23MW38B	E358-L	21-Dec-2023	22-Dec-2023	28 days	1 days	✓	22-Dec-2023	28 days	1 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE										
23MW38A	E290	21-Dec-2023	22-Dec-2023	14 days	1 days	✓	22-Dec-2023	14 days	1 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE										
23MW38B	E290	21-Dec-2023	22-Dec-2023	14 days	1 days	✓	22-Dec-2023	14 days	1 days	✓
Physical Tests : Conductivity in Water										
HDPE										
23MW38A	E100	21-Dec-2023	22-Dec-2023	28 days	1 days	✓	22-Dec-2023	28 days	1 days	✓
Physical Tests : Conductivity in Water										
HDPE										
23MW38B	E100	21-Dec-2023	22-Dec-2023	28 days	1 days	✓	22-Dec-2023	28 days	1 days	✓
Physical Tests : pH by Meter										
HDPE										
23MW38A	E108	21-Dec-2023	22-Dec-2023	0.25 hrs	28 hrs	✖ EHTR-FM	22-Dec-2023	0.25 hrs	28 hrs	✖ EHTR-FM
Physical Tests : pH by Meter										
HDPE										
23MW38B	E108	21-Dec-2023	22-Dec-2023	0.25 hrs	29 hrs	✖ EHTR-FM	22-Dec-2023	0.25 hrs	29 hrs	✖ EHTR-FM
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate)										
23MW38A	E611A	21-Dec-2023	27-Dec-2023	14 days	6 days	✓	27-Dec-2023	14 days	6 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate)										
23MW38B	E611A	21-Dec-2023	27-Dec-2023	14 days	6 days	✓	27-Dec-2023	14 days	6 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Volatile Organic Compounds : VOCs (Prairies List) by Headspace GC-MS										
Glass vial (sodium bisulfate) 23MW38A	E611E	21-Dec-2023	27-Dec-2023	14 days	6 days	✓	27-Dec-2023	14 days	6 days	✓
Volatile Organic Compounds : VOCs (Prairies List) by Headspace GC-MS										
Glass vial (sodium bisulfate) 23MW38B	E611E	21-Dec-2023	27-Dec-2023	14 days	6 days	✓	27-Dec-2023	14 days	6 days	✓

Legend & Qualifier Definitions

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended

Rec. HT: ALS recommended hold time (see units).

UCP: Unsuitable Container and/or Preservative used (invalidates standard hold time). Maximum hold time of zero applied. Test results may be biased low / unreliable, and may not meet regulatory requirements.

Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Water**

Evaluation: × = *QC frequency outside specification*; ✓ = *QC frequency within specification.*

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Duplicates (DUP)							
Alkalinity Species by Titration	E290	1287206	1	13	7.6	5.0	✓
Ammonia by Fluorescence	E298	1286110	1	5	20.0	5.0	✓
BTEX by Headspace GC-MS	E611A	1288542	1	2	50.0	5.0	✓
CCME PHC - F1 by Headspace GC-FID	E581.F1	1288543	1	2	50.0	5.0	✓
Chloride in Water by IC	E235.Cl	1286111	1	8	12.5	5.0	✓
Conductivity in Water	E100	1287205	1	13	7.6	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	1287722	1	8	12.5	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	1286997	1	8	12.5	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	1287454	2	6	33.3	5.0	✓
Fluoride in Water by IC	E235.F	1286112	1	6	16.6	5.0	✓
Nitrate in Water by IC	E235.NO3	1286113	1	6	16.6	5.0	✓
Nitrite in Water by IC	E235.NO2	1286114	1	6	16.6	5.0	✓
pH by Meter	E108	1287204	1	20	5.0	5.0	✓
Phenols (4AAP) in Water by Colorimetry	E562	1291349	1	11	9.0	5.0	✓
Sulfate in Water by IC	E235.SO4	1286115	1	6	16.6	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	1288621	1	11	9.0	5.0	✓
VOCs (Prairies List) by Headspace GC-MS	E611E	1288544	1	2	50.0	5.0	✓
Laboratory Control Samples (LCS)							
Alkalinity Species by Titration	E290	1287206	1	13	7.6	5.0	✓
Ammonia by Fluorescence	E298	1286110	1	5	20.0	5.0	✓
BTEX by Headspace GC-MS	E611A	1288542	1	2	50.0	5.0	✓
CCME PHC - F1 by Headspace GC-FID	E581.F1	1288543	1	2	50.0	5.0	✓
CCME PHCs - F2-F4 by GC-FID	E601	1286778	1	8	12.5	5.0	✓
Chloride in Water by IC	E235.Cl	1286111	1	8	12.5	5.0	✓
Conductivity in Water	E100	1287205	1	13	7.6	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	1287722	1	8	12.5	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	1286997	1	8	12.5	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	1287454	2	6	33.3	5.0	✓
Fluoride in Water by IC	E235.F	1286112	1	6	16.6	5.0	✓
Nitrate in Water by IC	E235.NO3	1286113	1	6	16.6	5.0	✓
Nitrite in Water by IC	E235.NO2	1286114	1	6	16.6	5.0	✓
pH by Meter	E108	1287204	1	20	5.0	5.0	✓
Phenols (4AAP) in Water by Colorimetry	E562	1291349	1	11	9.0	5.0	✓
Sulfate in Water by IC	E235.SO4	1286115	1	6	16.6	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	1288621	1	11	9.0	5.0	✓
VOCs (Prairies List) by Headspace GC-MS	E611E	1288544	1	2	50.0	5.0	✓

Matrix: **Water**

Evaluation: × = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Method Blanks (MB)							
Alkalinity Species by Titration	E290	1287206	1	13	7.6	5.0	✓
Ammonia by Fluorescence	E298	1286110	1	5	20.0	5.0	✓
BTEX by Headspace GC-MS	E611A	1288542	1	2	50.0	5.0	✓
CCME PHC - F1 by Headspace GC-FID	E581.F1	1288543	1	2	50.0	5.0	✓
CCME PHCs - F2-F4 by GC-FID	E601	1286778	1	8	12.5	5.0	✓
Chloride in Water by IC	E235.Cl	1286111	1	8	12.5	5.0	✓
Conductivity in Water	E100	1287205	1	13	7.6	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	1287722	1	8	12.5	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	1286997	1	8	12.5	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	1287454	2	6	33.3	5.0	✓
Fluoride in Water by IC	E235.F	1286112	1	6	16.6	5.0	✓
Nitrate in Water by IC	E235.NO3	1286113	1	6	16.6	5.0	✓
Nitrite in Water by IC	E235.NO2	1286114	1	6	16.6	5.0	✓
Phenols (4AAP) in Water by Colorimetry	E562	1291349	1	11	9.0	5.0	✓
Sulfate in Water by IC	E235.SO4	1286115	1	6	16.6	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	1288621	1	11	9.0	5.0	✓
VOCs (Prairies List) by Headspace GC-MS	E611E	1288544	1	2	50.0	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	1286110	1	5	20.0	5.0	✓
BTEX by Headspace GC-MS	E611A	1288542	1	2	50.0	5.0	✓
Chloride in Water by IC	E235.Cl	1286111	1	8	12.5	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	1287722	1	8	12.5	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	1286997	1	8	12.5	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	1287454	2	6	33.3	5.0	✓
Fluoride in Water by IC	E235.F	1286112	1	6	16.6	5.0	✓
Nitrate in Water by IC	E235.NO3	1286113	1	6	16.6	5.0	✓
Nitrite in Water by IC	E235.NO2	1286114	1	6	16.6	5.0	✓
Phenols (4AAP) in Water by Colorimetry	E562	1291349	1	11	9.0	5.0	✓
Sulfate in Water by IC	E235.SO4	1286115	1	6	16.6	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	1288621	1	11	9.0	5.0	✓
VOCs (Prairies List) by Headspace GC-MS	E611E	1288544	1	2	50.0	5.0	✓

Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Conductivity in Water	E100 ALS Environmental - Edmonton	Water	APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a water sample. Conductivity measurements are temperature-compensated to 25°C.
pH by Meter	E108 ALS Environmental - Edmonton	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
Chloride in Water by IC	E235.Cl ALS Environmental - Edmonton	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Fluoride in Water by IC	E235.F ALS Environmental - Edmonton	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrite in Water by IC	E235.NO2 ALS Environmental - Edmonton	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Water by IC	E235.NO3 ALS Environmental - Edmonton	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Sulfate in Water by IC	E235.SO4 ALS Environmental - Edmonton	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Alkalinity Species by Titration	E290 ALS Environmental - Edmonton	Water	APHA 2320 B (mod)	Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.
Ammonia by Fluorescence	E298 ALS Environmental - Edmonton	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318 ALS Environmental - Edmonton	Water	Method Fialab 100, 2018	TKN in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021).

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Dissolved Organic Carbon by Combustion (Low Level)	E358-L ALS Environmental - Edmonton	Water	APHA 5310 B (mod)	Dissolved Organic Carbon (Non-Purgeable), also known as NPOC (dissolved), is a direct measurement of DOC after a filtered (0.45 micron) sample has been acidified and purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO2. NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of DC (dissolved carbon) is comprised of IC (which is common), this method is more accurate and more reliable than the DOC by subtraction method (i.e. DC minus DIC).
Dissolved Metals in Water by CRC ICPMS	E421 ALS Environmental - Edmonton	Water	APHA 3030B/EPA 6020B (mod)	Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by Collision/Reaction Cell ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Dissolved Mercury in Water by CVAAS	E509 ALS Environmental - Edmonton	Water	APHA 3030B/EPA 1631E (mod)	Water samples are filtered (0.45 um), preserved with HCl, then undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.
Phenols (4AAP) in Water by Colorimetry	E562 ALS Environmental - Edmonton	Water	EPA 9066	This automated method is based on the distillation of phenol and subsequent reaction of the distillate with alkaline ferricyanide (K3Fe(CN)6) and 4-amino-antipyrine (4-AAP) to form a red complex which is measured colorimetrically.
CCME PHC - F1 by Headspace GC-FID	E581.F1 ALS Environmental - Edmonton	Water	CCME PHC in Soil - Tier 1	CCME Fraction 1 (F1) is analyzed by static headspace GC-FID. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law. Analytical methods for CCME Petroleum Hydrocarbons (PHCs) are validated to comply fully with the Reference Method for the Canada-Wide Standard for PHC. Unless qualified, all required quality control criteria of the CCME PHC method have been met, including response factor and linearity requirements.
CCME PHCs - F2-F4 by GC-FID	E601 ALS Environmental - Edmonton	Water	CCME PHC in Soil - Tier 1	Sample extracts are analyzed by GC-FID for CCME hydrocarbon fractions (F2-F4). Analytical methods for CCME Petroleum Hydrocarbons (PHCs) are validated to comply fully with the Reference Method for the Canada-Wide Standard for PHC. Unless qualified, all required quality control criteria of the CCME PHC method have been met, including response factor and linearity requirements.
BTEX by Headspace GC-MS	E611A ALS Environmental - Edmonton	Water	EPA 8260D (mod)	Volatile Organic Compounds (VOCs) are analyzed by static headspace GC-MS. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
VOCs (Prairies List) by Headspace GC-MS	E611E ALS Environmental - Edmonton	Water	EPA 8260D (mod)	Volatile Organic Compounds (VOCs) are analyzed by static headspace GC-MS. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Dissolved Hardness (Calculated)	EC100 ALS Environmental - Edmonton	Water	APHA 2340B	"Hardness (as CaCO3), dissolved" is calculated from the sum of dissolved Calcium and Magnesium concentrations, expressed in CaCO3 equivalents. "Total Hardness" refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because it is a property of water due to dissolved divalent cations.
Ion Balance using Dissolved Metals	EC101 ALS Environmental - Edmonton	Water	APHA 1030E	Cation Sum, Anion Sum, and Ion Balance are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Dissolved species are used where available. Minor ions are included where data is present. Ion Balance cannot be calculated accurately for waters with very low electrical conductivity (EC).
TDS in Water (Calculation)	EC103 ALS Environmental - Edmonton	Water	APHA 1030E (mod)	Total Dissolved Solids is calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Dissolved species are used where available. Minor ions are included where data is present.
Nitrate and Nitrite (as N) (Calculation)	EC235.N+N ALS Environmental - Edmonton	Water	EPA 300.0	Nitrate and Nitrite (as N) is a calculated parameter. Nitrate and Nitrite (as N) = Nitrite (as N) + Nitrate (as N).
F1-BTEX	EC580 ALS Environmental - Edmonton	Water	CCME PHC in Soil - Tier 1	F1-BTEX is calculated as follows: F1-BTEX = F1 (C6-C10) minus benzene, toluene, ethylbenzene and xylenes (BTEX).

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 ALS Environmental - Edmonton	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Digestion for TKN in water	EP318 ALS Environmental - Edmonton	Water	APHA 4500-Norg D (mod)	Samples are digested at high temperature using Sulfuric Acid with Copper catalyst, which converts organic nitrogen sources to Ammonia, which is then quantified by the analytical method as TKN. This method is unsuitable for samples containing high levels of nitrate. If nitrate exceeds TKN concentration by ten times or more, results may be biased low.
Preparation for Dissolved Organic Carbon for Combustion	EP358 ALS Environmental - Edmonton	Water	APHA 5310 B (mod)	Preparation for Dissolved Organic Carbon
Dissolved Metals Water Filtration	EP421 ALS Environmental - Edmonton	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HNO3.
Dissolved Mercury Water Filtration	EP509 ALS Environmental - Edmonton	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HCl.

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
VOCs Preparation for Headspace Analysis	EP581 ALS Environmental - Edmonton	Water	EPA 5021A (mod)	Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler. An aliquot of the headspace is then injected into the GC/MS-FID system.
PHCs and PAHs Hexane Extraction	EP601 ALS Environmental - Edmonton	Water	EPA 3511 (mod)	Petroleum Hydrocarbons (PHCs) and Polycyclic Aromatic Hydrocarbons (PAHs) are extracted using a hexane liquid-liquid extraction.

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QUALITY CONTROL REPORT

Work Order	: **EO2311630**	Page	: 1 of 21
Client	: Tetra Tech Canada Inc.	Laboratory	: ALS Environmental - Edmonton
Contact	: William Wood	Account Manager	: Kieran Tordoff
Address	: North Building 14940 123 Ave NW Edmonton AB Canada T5V 1B4	Address	: 9450 - 17 Avenue NW Edmonton, Alberta Canada T6N 1M9
Telephone	:	Telephone	: +1 780 413 5227
Project	: SWM.SWOP04591-02	Date Samples Received	: 21-Dec-2023 12:50
PO	: ----	Date Analysis Commenced	: 21-Dec-2023
C-O-C number	: ----	Issue Date	: 30-Dec-2023 14:07
Sampler	: WW 587-986-2709		
Site	: ----		
Quote number	: EO23-EBAE100-006 (Q83988)		
No. of samples received	: 2		
No. of samples analysed	: 2		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percent Difference (RPD) and Data Quality Objectives
- Matrix Spike (MS) Report; Recovery and Data Quality Objectives
- Method Blank (MB) Report; Recovery and Data Quality Objectives
- Laboratory Control Sample (LCS) Report; Recovery and Data Quality Objectives

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	*Position*	*Laboratory Department*
Brayden Ginther	Laboratory Analyst	Edmonton Metals, Edmonton, Alberta
Daniel Nguyen	Lab Assistant	Edmonton Metals, Edmonton, Alberta
Jing Liu	Lab Assistant	Edmonton Inorganics, Edmonton, Alberta
Kari Mulroy	Lab Supervisor - Environmental	Edmonton Organics, Edmonton, Alberta
Logan Carroll	Laboratory Analyst	Edmonton Inorganics, Edmonton, Alberta
Shruti Mudliar	Lab Analyst	Edmonton Inorganics, Edmonton, Alberta
Shruti Mudliar	Lab Analyst	Edmonton Metals, Edmonton, Alberta
Yan Zhang	Lab Analyst	Edmonton Organics, Edmonton, Alberta

General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number = Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO = Data Quality Objective.
LOR = Limit of Reporting (detection limit).
RPD = Relative Percent Difference
# = Indicates a QC result that did not meet the ALS DQO.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test-specific).

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Physical Tests (QC Lot: 1287204)											
EO2311633-002	Anonymous	pH	----	E108	0.10	pH units	8.01	7.94	0.878%	3%	----
Physical Tests (QC Lot: 1287205)											
EO2311633-002	Anonymous	Conductivity	----	E100	1.0	µS/cm	326	328	0.612%	10%	----
Physical Tests (QC Lot: 1287206)											
EO2311633-002	Anonymous	Alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	115	114	1.13%	20%	----
Anions and Nutrients (QC Lot: 1286110)											
FC2303579-007	Anonymous	Ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1286111)											
EO2311633-002	Anonymous	Chloride	16887-00-6	E235.Cl	0.50	mg/L	5.24	5.25	0.172%	20%	----
Anions and Nutrients (QC Lot: 1286112)											
EO2311633-002	Anonymous	Fluoride	16984-48-8	E235.F	0.020	mg/L	0.642	0.650	1.24%	20%	----
Anions and Nutrients (QC Lot: 1286113)											
EO2311633-002	Anonymous	Nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	0.099	0.097	0.002	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1286114)											
EO2311633-002	Anonymous	Nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1286115)											
EO2311633-002	Anonymous	Sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	54.1	54.2	0.198%	20%	----
Anions and Nutrients (QC Lot: 1288621)											
EO2311598-001	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	0.200	mg/L	0.438	0.442	0.004	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 1287454)											
FC2303579-006	Anonymous	Carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	8.02	7.89	1.62%	20%	----
Organic / Inorganic Carbon (QC Lot: 1288194)											
EO2311630-001	23MW38A	Carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	25.2	25.1	0.347%	20%	----
Dissolved Metals (QC Lot: 1286997)											
EO2311630-001	23MW38A	Aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	0.0192	0.0196	2.08%	20%	----
		Antimony, dissolved	7440-36-0	E421	0.00010	mg/L	0.00059	0.00058	0.000005	Diff <2x LOR	----
		Arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	0.00354	0.00353	0.444%	20%	----
		Barium, dissolved	7440-39-3	E421	0.00010	mg/L	0.0811	0.0807	0.492%	20%	----
		Beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	<0.000020	<0.000020	0	Diff <2x LOR	----
		Bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----

Sub-Matrix: **Water**

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Laboratory Duplicate (DUP) Report						
					LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Dissolved Metals (QC Lot: 1286997) - continued											
EO2311630-001	23MW38A	Boron, dissolved	7440-42-8	E421	0.010	mg/L	0.786	0.778	1.04%	20%	----
		Cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	<0.0000050	0.0000050	0.00000004	Diff <2x LOR	----
		Calcium, dissolved	7440-70-2	E421	0.050	mg/L	11.3	11.2	0.726%	20%	----
		Cesium, dissolved	7440-46-2	E421	0.000010	mg/L	0.000038	0.000039	0.0000009	Diff <2x LOR	----
		Chromium, dissolved	7440-47-3	E421	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		Cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	0.00068	0.00068	0.000001	Diff <2x LOR	----
		Copper, dissolved	7440-50-8	E421	0.00020	mg/L	0.00114	0.00115	0.00001	Diff <2x LOR	----
		Iron, dissolved	7439-89-6	E421	0.010	mg/L	0.014	0.012	0.001	Diff <2x LOR	----
		Lead, dissolved	7439-92-1	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		Lithium, dissolved	7439-93-2	E421	0.0010	mg/L	0.0835	0.0818	2.00%	20%	----
		Magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	2.57	2.57	0.0679%	20%	----
		Manganese, dissolved	7439-96-5	E421	0.00010	mg/L	0.00706	0.00688	2.59%	20%	----
		Molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	0.0136	0.0135	0.376%	20%	----
		Nickel, dissolved	7440-02-0	E421	0.00050	mg/L	0.00382	0.00381	0.00001	Diff <2x LOR	----
		Phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	0.146	0.145	0.001	Diff <2x LOR	----
		Potassium, dissolved	7440-09-7	E421	0.050	mg/L	3.74	3.78	0.983%	20%	----
		Rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	0.00365	0.00368	1.02%	20%	----
		Selenium, dissolved	7782-49-2	E421	0.000050	mg/L	0.00153	0.00151	0.947%	20%	----
		Silicon, dissolved	7440-21-3	E421	0.050	mg/L	4.14	4.12	0.536%	20%	----
		Silver, dissolved	7440-22-4	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		Sodium, dissolved	7440-23-5	E421	0.050	mg/L	499	497	0.355%	20%	----
		Strontium, dissolved	7440-24-6	E421	0.00020	mg/L	0.124	0.120	3.58%	20%	----
		Sulfur, dissolved	7704-34-9	E421	0.50	mg/L	50.4	50.4	0.128%	20%	----
		Tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		Thallium, dissolved	7440-28-0	E421	0.000010	mg/L	0.000011	0.000011	0.0000004	Diff <2x LOR	----
		Thorium, dissolved	7440-29-1	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Tin, dissolved	7440-31-5	E421	0.00010	mg/L	0.00047	0.00041	0.00006	Diff <2x LOR	----
		Titanium, dissolved	7440-32-6	E421	0.00030	mg/L	0.00055	0.00061	0.00006	Diff <2x LOR	----
		Tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	0.00050	0.00053	0.00003	Diff <2x LOR	----
		Uranium, dissolved	7440-61-1	E421	0.000010	mg/L	0.00218	0.00224	2.75%	20%	----
		Vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	0.00174	0.00169	0.00006	Diff <2x LOR	----
		Zinc, dissolved	7440-66-6	E421	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
		Zirconium, dissolved	7440-67-7	E421	0.00020	mg/L	0.00185	0.00184	0.000006	Diff <2x LOR	----
Dissolved Metals (QC Lot: 1287722)											

Sub-Matrix: **Water**

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Laboratory Duplicate (DUP) Report						
					LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Dissolved Metals (QC Lot: 1287722) - continued											
EO2311602-001	Anonymous	Mercury, dissolved	7439-97-6	E509	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
Aggregate Organics (QC Lot: 1291349)											
CG2317951-005	Anonymous	Phenols, total (4AAP)	----	E562	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
Volatile Organic Compounds (QC Lot: 1288542)											
EO2311630-001	23MW38A	Benzene	71-43-2	E611A	0.50	µg/L	<0.00050 mg/L	<0.50	0	Diff <2x LOR	----
		Ethylbenzene	100-41-4	E611A	0.50	µg/L	<0.00050 mg/L	<0.50	0	Diff <2x LOR	----
		Styrene	100-42-5	E611A	0.50	µg/L	<0.00050 mg/L	<0.50	0	Diff <2x LOR	----
		Toluene	108-88-3	E611A	0.50	µg/L	<0.00050 mg/L	<0.50	0	Diff <2x LOR	----
		Xylene, m+p-	179601-23-1	E611A	0.40	µg/L	<0.00040 mg/L	<0.40	0	Diff <2x LOR	----
		Xylene, o-	95-47-6	E611A	0.30	µg/L	<0.00030 mg/L	<0.30	0	Diff <2x LOR	----
Volatile Organic Compounds (QC Lot: 1288544)											
EO2311630-001	23MW38A	Benzene	71-43-2	E611E	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Bromobenzene	108-86-1	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Bromochloromethane	74-97-5	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Bromodichloromethane	75-27-4	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Bromoform	75-25-2	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Bromomethane	74-83-9	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Butylbenzene, n-	104-51-8	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Butylbenzene, sec-	135-98-8	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Butylbenzene, tert-	98-06-6	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Carbon tetrachloride	56-23-5	E611E	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Chlorobenzene	108-90-7	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Chloroethane	75-00-3	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Chloroform	67-66-3	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Chloromethane	74-87-3	E611E	5.0	µg/L	<5.0	<5.0	0	Diff <2x LOR	----
		Chlorotoluene, 2-	95-49-8	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Chlorotoluene, 4-	106-43-4	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Cymene, p-	99-87-6	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dibromo-3-chloropropane, 1,2-	96-12-8	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dibromochloromethane	124-48-1	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dibromoethane, 1,2-	106-93-4	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----

Sub-Matrix: **Water**

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Laboratory Duplicate (DUP) Report						
					LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Volatile Organic Compounds (QC Lot: 1288544) - continued											
EO2311630-001	23MW38A	Dibromomethane	74-95-3	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dichlorobenzene, 1,2-	95-50-1	E611E	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Dichlorobenzene, 1,3-	541-73-1	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dichlorobenzene, 1,4-	106-46-7	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dichlorodifluoromethane	75-71-8	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dichloroethane, 1,1-	75-34-3	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dichloroethane, 1,2-	107-06-2	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dichloroethylene, 1,1-	75-35-4	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dichloroethylene, cis-1,2-	156-59-2	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dichloroethylene, trans-1,2-	156-60-5	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dichloromethane	75-09-2	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dichloropropane, 1,2-	78-87-5	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dichloropropane, 1,3-	142-28-9	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dichloropropane, 2,2-	594-20-7	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dichloropropylene, 1,1-	563-58-6	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dichloropropylene, cis-1,3-	10061-01-5	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dichloropropylene, trans-1,3-	10061-02-6	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Ethylbenzene	100-41-4	E611E	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Hexachlorobutadiene	87-68-3	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Isopropylbenzene	98-82-8	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Methyl-tert-butyl ether [MTBE]	1634-04-4	E611E	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Propylbenzene, n-	103-65-1	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Styrene	100-42-5	E611E	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Tetrachloroethane, 1,1,1,2-	630-20-6	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Tetrachloroethane, 1,1,2,2-	79-34-5	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Tetrachloroethylene	127-18-4	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Toluene	108-88-3	E611E	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Trichlorobenzene, 1,2,3-	87-61-6	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Trichlorobenzene, 1,2,4-	120-82-1	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Trichloroethane, 1,1,1-	71-55-6	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Trichloroethane, 1,1,2-	79-00-5	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Trichloroethylene	79-01-6	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Trichlorofluoromethane	75-69-4	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Trichloropropane, 1,2,3-	96-18-4	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----

Sub-Matrix: **Water**

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Laboratory Duplicate (DUP) Report						
					LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Volatile Organic Compounds (QC Lot: 1288544) - continued											
EO2311630-001	23MW38A	Trimethylbenzene, 1,2,4-	95-63-6	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Trimethylbenzene, 1,3,5-	108-67-8	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Vinyl chloride	75-01-4	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Xylene, m+p-	179601-23-1	E611E	0.40	µg/L	<0.40	<0.40	0	Diff <2x LOR	----
		Xylene, o-	95-47-6	E611E	0.30	µg/L	<0.30	<0.30	0	Diff <2x LOR	----
Hydrocarbons (QC Lot: 1288543)											
EO2311630-001	23MW38A	F1 (C6-C10)	----	E581.F1	100	µg/L	<0.10 mg/L	<100	0	Diff <2x LOR	----

Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 1287205)						
Conductivity	----	E100	1	µS/cm	<1.0	----
Physical Tests (QCLot: 1287206)						
Alkalinity, total (as CaCO3)	----	E290	1	mg/L	<1.0	----
Anions and Nutrients (QCLot: 1286110)						
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 1286111)						
Chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 1286112)						
Fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 1286113)						
Nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 1286114)						
Nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	<0.010	----
Anions and Nutrients (QCLot: 1286115)						
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 1288621)						
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	<0.050	----
Organic / Inorganic Carbon (QCLot: 1287454)						
Carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	<0.50	----
Organic / Inorganic Carbon (QCLot: 1288194)						
Carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	<0.50	----
Dissolved Metals (QCLot: 1286997)						
Aluminum, dissolved	7429-90-5	E421	0.001	mg/L	<0.0010	----
Antimony, dissolved	7440-36-0	E421	0.0001	mg/L	<0.00010	----
Arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	<0.00010	----
Barium, dissolved	7440-39-3	E421	0.0001	mg/L	<0.00010	----
Beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	<0.000020	----
Bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	<0.000050	----
Boron, dissolved	7440-42-8	E421	0.01	mg/L	<0.010	----
Cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	<0.0000050	----
Calcium, dissolved	7440-70-2	E421	0.05	mg/L	<0.050	----
Cesium, dissolved	7440-46-2	E421	0.00001	mg/L	<0.000010	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Dissolved Metals (QCLot: 1286997) - continued						
Chromium, dissolved	7440-47-3	E421	0.0005	mg/L	<0.00050	----
Cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	<0.00010	----
Copper, dissolved	7440-50-8	E421	0.0002	mg/L	<0.00020	----
Iron, dissolved	7439-89-6	E421	0.01	mg/L	<0.010	----
Lead, dissolved	7439-92-1	E421	0.00005	mg/L	<0.000050	----
Lithium, dissolved	7439-93-2	E421	0.001	mg/L	<0.0010	----
Magnesium, dissolved	7439-95-4	E421	0.005	mg/L	<0.0050	----
Manganese, dissolved	7439-96-5	E421	0.0001	mg/L	<0.00010	----
Molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	<0.000050	----
Nickel, dissolved	7440-02-0	E421	0.0005	mg/L	<0.00050	----
Phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	<0.050	----
Potassium, dissolved	7440-09-7	E421	0.05	mg/L	<0.050	----
Rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	<0.00020	----
Selenium, dissolved	7782-49-2	E421	0.00005	mg/L	<0.000050	----
Silicon, dissolved	7440-21-3	E421	0.05	mg/L	<0.050	----
Silver, dissolved	7440-22-4	E421	0.00001	mg/L	<0.000010	----
Sodium, dissolved	7440-23-5	E421	0.05	mg/L	<0.050	----
Strontium, dissolved	7440-24-6	E421	0.0002	mg/L	<0.00020	----
Sulfur, dissolved	7704-34-9	E421	0.5	mg/L	<0.50	----
Tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	<0.00020	----
Thallium, dissolved	7440-28-0	E421	0.00001	mg/L	<0.000010	----
Thorium, dissolved	7440-29-1	E421	0.0001	mg/L	<0.00010	----
Tin, dissolved	7440-31-5	E421	0.0001	mg/L	<0.00010	----
Titanium, dissolved	7440-32-6	E421	0.0003	mg/L	<0.00030	----
Tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	<0.00010	----
Uranium, dissolved	7440-61-1	E421	0.00001	mg/L	<0.000010	----
Vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	<0.00050	----
Zinc, dissolved	7440-66-6	E421	0.001	mg/L	<0.0010	----
Zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	<0.00020	----
Dissolved Metals (QCLot: 1287722)						
Mercury, dissolved	7439-97-6	E509	0.000005	mg/L	<0.0000050	----
Aggregate Organics (QCLot: 1291349)						
Phenols, total (4AAP)	----	E562	0.001	mg/L	<0.0010	----
Volatile Organic Compounds (QCLot: 1288542)						
Benzene	71-43-2	E611A	0.5	µg/L	<0.50	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Volatile Organic Compounds (QCLot: 1288542) - continued						
Ethylbenzene	100-41-4	E611A	0.5	µg/L	<0.50	----
Styrene	100-42-5	E611A	0.5	µg/L	<0.50	----
Toluene	108-88-3	E611A	0.5	µg/L	<0.50	----
Xylene, m+p-	179601-23-1	E611A	0.4	µg/L	<0.40	----
Xylene, o-	95-47-6	E611A	0.3	µg/L	<0.30	----
Volatile Organic Compounds (QCLot: 1288544)						
Benzene	71-43-2	E611E	0.5	µg/L	<0.50	----
Bromobenzene	108-86-1	E611E	1	µg/L	<1.0	----
Bromochloromethane	74-97-5	E611E	1	µg/L	<1.0	----
Bromodichloromethane	75-27-4	E611E	1	µg/L	<1.0	----
Bromoform	75-25-2	E611E	1	µg/L	<1.0	----
Bromomethane	74-83-9	E611E	1	µg/L	<1.0	----
Butylbenzene, n-	104-51-8	E611E	1	µg/L	<1.0	----
Butylbenzene, sec-	135-98-8	E611E	1	µg/L	<1.0	----
Butylbenzene, tert-	98-06-6	E611E	1	µg/L	<1.0	----
Carbon tetrachloride	56-23-5	E611E	0.5	µg/L	<0.50	----
Chlorobenzene	108-90-7	E611E	1	µg/L	<1.0	----
Chloroethane	75-00-3	E611E	1	µg/L	<1.0	----
Chloroform	67-66-3	E611E	1	µg/L	<1.0	----
Chloromethane	74-87-3	E611E	5	µg/L	<5.0	----
Chlorotoluene, 2-	95-49-8	E611E	1	µg/L	<1.0	----
Chlorotoluene, 4-	106-43-4	E611E	1	µg/L	<1.0	----
Cymene, p-	99-87-6	E611E	1	µg/L	<1.0	----
Dibromo-3-chloropropane, 1,2-	96-12-8	E611E	1	µg/L	<1.0	----
Dibromochloromethane	124-48-1	E611E	1	µg/L	<1.0	----
Dibromoethane, 1,2-	106-93-4	E611E	1	µg/L	<1.0	----
Dibromomethane	74-95-3	E611E	1	µg/L	<1.0	----
Dichlorobenzene, 1,2-	95-50-1	E611E	0.5	µg/L	<0.50	----
Dichlorobenzene, 1,3-	541-73-1	E611E	1	µg/L	<1.0	----
Dichlorobenzene, 1,4-	106-46-7	E611E	1	µg/L	<1.0	----
Dichlorodifluoromethane	75-71-8	E611E	1	µg/L	<1.0	----
Dichloroethane, 1,1-	75-34-3	E611E	1	µg/L	<1.0	----
Dichloroethane, 1,2-	107-06-2	E611E	1	µg/L	<1.0	----
Dichloroethylene, 1,1-	75-35-4	E611E	1	µg/L	<1.0	----
Dichloroethylene, cis-1,2-	156-59-2	E611E	1	µg/L	<1.0	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Volatile Organic Compounds (QCLot: 1288544) - continued						
Dichloroethylene, trans-1,2-	156-60-5	E611E	1	µg/L	<1.0	----
Dichloromethane	75-09-2	E611E	1	µg/L	<1.0	----
Dichloropropane, 1,2-	78-87-5	E611E	1	µg/L	<1.0	----
Dichloropropane, 1,3-	142-28-9	E611E	1	µg/L	<1.0	----
Dichloropropane, 2,2-	594-20-7	E611E	1	µg/L	<1.0	----
Dichloropropylene, 1,1-	563-58-6	E611E	1	µg/L	<1.0	----
Dichloropropylene, cis-1,3-	10061-01-5	E611E	1	µg/L	<1.0	----
Dichloropropylene, trans-1,3-	10061-02-6	E611E	1	µg/L	<1.0	----
Ethylbenzene	100-41-4	E611E	0.5	µg/L	<0.50	----
Hexachlorobutadiene	87-68-3	E611E	1	µg/L	<1.0	----
Isopropylbenzene	98-82-8	E611E	1	µg/L	<1.0	----
Methyl-tert-butyl ether [MTBE]	1634-04-4	E611E	0.5	µg/L	<0.50	----
Propylbenzene, n-	103-65-1	E611E	1	µg/L	<1.0	----
Styrene	100-42-5	E611E	0.5	µg/L	<0.50	----
Tetrachloroethane, 1,1,1,2-	630-20-6	E611E	1	µg/L	<1.0	----
Tetrachloroethane, 1,1,2,2-	79-34-5	E611E	1	µg/L	<1.0	----
Tetrachloroethylene	127-18-4	E611E	1	µg/L	<1.0	----
Toluene	108-88-3	E611E	0.5	µg/L	<0.50	----
Trichlorobenzene, 1,2,3-	87-61-6	E611E	1	µg/L	<1.0	----
Trichlorobenzene, 1,2,4-	120-82-1	E611E	1	µg/L	<1.0	----
Trichloroethane, 1,1,1-	71-55-6	E611E	1	µg/L	<1.0	----
Trichloroethane, 1,1,2-	79-00-5	E611E	1	µg/L	<1.0	----
Trichloroethylene	79-01-6	E611E	1	µg/L	<1.0	----
Trichlorofluoromethane	75-69-4	E611E	1	µg/L	<1.0	----
Trichloropropane, 1,2,3-	96-18-4	E611E	1	µg/L	<1.0	----
Trimethylbenzene, 1,2,4-	95-63-6	E611E	1	µg/L	<1.0	----
Trimethylbenzene, 1,3,5-	108-67-8	E611E	1	µg/L	<1.0	----
Vinyl chloride	75-01-4	E611E	1	µg/L	<1.0	----
Xylene, m+p-	179601-23-1	E611E	0.4	µg/L	<0.40	----
Xylene, o-	95-47-6	E611E	0.3	µg/L	<0.30	----
Hydrocarbons (QCLot: 1286778)						
F2 (C10-C16)	----	E601	100	µg/L	<100	----
Hydrocarbons (QCLot: 1288543)						
F1 (C6-C10)	----	E581.F1	100	µg/L	<100	----

Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 1287204)									
pH	----	E108	----	pH units	6 pH units	100	97.0	103	----
Physical Tests (QCLot: 1287205)									
Conductivity	----	E100	1	µS/cm	1412 µS/cm	96.5	90.0	110	----
Physical Tests (QCLot: 1287206)									
Alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	99.3	85.0	115	----
Anions and Nutrients (QCLot: 1286110)									
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	97.5	85.0	115	----
Anions and Nutrients (QCLot: 1286111)									
Chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	100	90.0	110	----
Anions and Nutrients (QCLot: 1286112)									
Fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 1286113)									
Nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	2.5 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 1286114)									
Nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	0.5 mg/L	98.3	90.0	110	----
Anions and Nutrients (QCLot: 1286115)									
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 1288621)									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	93.6	75.0	125	----
Organic / Inorganic Carbon (QCLot: 1287454)									
Carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	90.8	80.0	120	----
Organic / Inorganic Carbon (QCLot: 1288194)									
Carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	108	80.0	120	----
Dissolved Metals (QCLot: 1286997)									
Aluminum, dissolved	7429-90-5	E421	0.001	mg/L	2 mg/L	99.8	80.0	120	----
Antimony, dissolved	7440-36-0	E421	0.0001	mg/L	1 mg/L	97.8	80.0	120	----
Arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	1 mg/L	103	80.0	120	----
Barium, dissolved	7440-39-3	E421	0.0001	mg/L	0.25 mg/L	104	80.0	120	----
Beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	0.1 mg/L	96.6	80.0	120	----

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Dissolved Metals (QCLot: 1286997) - continued									
Bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	1 mg/L	97.9	80.0	120	----
Boron, dissolved	7440-42-8	E421	0.01	mg/L	1 mg/L	94.4	80.0	120	----
Cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	0.1 mg/L	102	80.0	120	----
Calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	97.0	80.0	120	----
Cesium, dissolved	7440-46-2	E421	0.00001	mg/L	0.05 mg/L	97.5	80.0	120	----
Chromium, dissolved	7440-47-3	E421	0.0005	mg/L	0.25 mg/L	106	80.0	120	----
Cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	0.25 mg/L	104	80.0	120	----
Copper, dissolved	7440-50-8	E421	0.0002	mg/L	0.25 mg/L	100	80.0	120	----
Iron, dissolved	7439-89-6	E421	0.01	mg/L	1 mg/L	94.5	80.0	120	----
Lead, dissolved	7439-92-1	E421	0.00005	mg/L	0.5 mg/L	101	80.0	120	----
Lithium, dissolved	7439-93-2	E421	0.001	mg/L	0.25 mg/L	97.3	80.0	120	----
Magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	103	80.0	120	----
Manganese, dissolved	7439-96-5	E421	0.0001	mg/L	0.25 mg/L	103	80.0	120	----
Molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	0.25 mg/L	102	80.0	120	----
Nickel, dissolved	7440-02-0	E421	0.0005	mg/L	0.5 mg/L	100	80.0	120	----
Phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	10 mg/L	109	80.0	120	----
Potassium, dissolved	7440-09-7	E421	0.05	mg/L	50 mg/L	102	80.0	120	----
Rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	0.1 mg/L	107	80.0	120	----
Selenium, dissolved	7782-49-2	E421	0.00005	mg/L	1 mg/L	101	80.0	120	----
Silicon, dissolved	7440-21-3	E421	0.05	mg/L	10 mg/L	104	80.0	120	----
Silver, dissolved	7440-22-4	E421	0.00001	mg/L	0.1 mg/L	91.4	80.0	120	----
Sodium, dissolved	7440-23-5	E421	0.05	mg/L	50 mg/L	104	80.0	120	----
Strontium, dissolved	7440-24-6	E421	0.0002	mg/L	0.25 mg/L	99.8	80.0	120	----
Sulfur, dissolved	7704-34-9	E421	0.5	mg/L	50 mg/L	111	80.0	120	----
Tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	0.1 mg/L	98.6	80.0	120	----
Thallium, dissolved	7440-28-0	E421	0.00001	mg/L	1 mg/L	99.5	80.0	120	----
Thorium, dissolved	7440-29-1	E421	0.0001	mg/L	0.1 mg/L	98.2	80.0	120	----
Tin, dissolved	7440-31-5	E421	0.0001	mg/L	0.5 mg/L	96.1	80.0	120	----
Titanium, dissolved	7440-32-6	E421	0.0003	mg/L	0.25 mg/L	98.7	80.0	120	----
Tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	0.1 mg/L	103	80.0	120	----
Uranium, dissolved	7440-61-1	E421	0.00001	mg/L	0.005 mg/L	99.1	80.0	120	----
Vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	0.5 mg/L	103	80.0	120	----
Zinc, dissolved	7440-66-6	E421	0.001	mg/L	0.5 mg/L	97.6	80.0	120	----
Zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	0.1 mg/L	98.2	80.0	120	----
Mercury, dissolved	7439-97-6	E509	0.000005	mg/L	0.0001 mg/L	90.3	80.0	120	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
					Concentration	LCS	Low	High	Qualifier
Aggregate Organics (QCLot: 1291349)									
Phenols, total (4AAP)	----	E562	0.001	mg/L	0.02 mg/L	95.4	85.0	115	----
Volatile Organic Compounds (QCLot: 1288542)									
Benzene	71-43-2	E611A	0.5	µg/L	100 µg/L	108	70.0	130	----
Ethylbenzene	100-41-4	E611A	0.5	µg/L	100 µg/L	98.0	70.0	130	----
Styrene	100-42-5	E611A	0.5	µg/L	100 µg/L	99.9	70.0	130	----
Toluene	108-88-3	E611A	0.5	µg/L	100 µg/L	97.1	70.0	130	----
Xylene, m+p-	179601-23-1	E611A	0.4	µg/L	200 µg/L	101	70.0	130	----
Xylene, o-	95-47-6	E611A	0.3	µg/L	100 µg/L	100	70.0	130	----
Volatile Organic Compounds (QCLot: 1288544)									
Benzene	71-43-2	E611E	0.5	µg/L	100 µg/L	108	70.0	130	----
Bromobenzene	108-86-1	E611E	1	µg/L	100 µg/L	111	70.0	130	----
Bromochloromethane	74-97-5	E611E	1	µg/L	100 µg/L	108	70.0	130	----
Bromodichloromethane	75-27-4	E611E	1	µg/L	100 µg/L	105	70.0	130	----
Bromoform	75-25-2	E611E	1	µg/L	100 µg/L	118	70.0	130	----
Bromomethane	74-83-9	E611E	1	µg/L	100 µg/L	116	60.0	140	----
Butylbenzene, n-	104-51-8	E611E	1	µg/L	100 µg/L	109	70.0	130	----
Butylbenzene, sec-	135-98-8	E611E	1	µg/L	100 µg/L	101	70.0	130	----
Butylbenzene, tert-	98-06-6	E611E	1	µg/L	100 µg/L	105	70.0	130	----
Carbon tetrachloride	56-23-5	E611E	0.5	µg/L	100 µg/L	120	70.0	130	----
Chlorobenzene	108-90-7	E611E	1	µg/L	100 µg/L	104	70.0	130	----
Chloroethane	75-00-3	E611E	1	µg/L	100 µg/L	94.0	60.0	140	----
Chloroform	67-66-3	E611E	1	µg/L	100 µg/L	116	70.0	130	----
Chloromethane	74-87-3	E611E	5	µg/L	100 µg/L	102	60.0	140	----
Chlorotoluene, 2-	95-49-8	E611E	1	µg/L	100 µg/L	112	70.0	130	----
Chlorotoluene, 4-	106-43-4	E611E	1	µg/L	100 µg/L	118	70.0	130	----
Cymene, p-	99-87-6	E611E	1	µg/L	100 µg/L	104	70.0	130	----
Dibromo-3-chloropropane, 1,2-	96-12-8	E611E	1	µg/L	100 µg/L	99.5	70.0	130	----
Dibromochloromethane	124-48-1	E611E	1	µg/L	100 µg/L	112	70.0	130	----
Dibromoethane, 1,2-	106-93-4	E611E	1	µg/L	100 µg/L	102	70.0	130	----
Dibromomethane	74-95-3	E611E	1	µg/L	100 µg/L	103	70.0	130	----
Dichlorobenzene, 1,2-	95-50-1	E611E	0.5	µg/L	100 µg/L	103	70.0	130	----
Dichlorobenzene, 1,3-	541-73-1	E611E	1	µg/L	100 µg/L	104	70.0	130	----
Dichlorobenzene, 1,4-	106-46-7	E611E	1	µg/L	100 µg/L	115	70.0	130	----
Dichlorodifluoromethane	75-71-8	E611E	1	µg/L	100 µg/L	121	60.0	140	----
Dichloroethane, 1,1-	75-34-3	E611E	1	µg/L	100 µg/L	116	70.0	130	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report: Spike Concentration	Recovery (%) LCS	Recovery Limits (%) Low	Recovery Limits (%) High	Qualifier
Volatile Organic Compounds (QCLot: 1288544) - continued									
Dichloroethane, 1,2-	107-06-2	E611E	1	µg/L	100 µg/L	111	70.0	130	----
Dichloroethylene, 1,1-	75-35-4	E611E	1	µg/L	100 µg/L	105	70.0	130	----
Dichloroethylene, cis-1,2-	156-59-2	E611E	1	µg/L	100 µg/L	95.7	70.0	130	----
Dichloroethylene, trans-1,2-	156-60-5	E611E	1	µg/L	100 µg/L	122	70.0	130	----
Dichloromethane	75-09-2	E611E	1	µg/L	100 µg/L	102	70.0	130	----
Dichloropropane, 1,2-	78-87-5	E611E	1	µg/L	100 µg/L	110	70.0	130	----
Dichloropropane, 1,3-	142-28-9	E611E	1	µg/L	100 µg/L	101	70.0	130	----
Dichloropropane, 2,2-	594-20-7	E611E	1	µg/L	100 µg/L	115	70.0	130	----
Dichloropropylene, 1,1-	563-58-6	E611E	1	µg/L	100 µg/L	97.2	70.0	130	----
Dichloropropylene, cis-1,3-	10061-01-5	E611E	1	µg/L	100 µg/L	95.7	70.0	130	----
Dichloropropylene, trans-1,3-	10061-02-6	E611E	1	µg/L	100 µg/L	106	70.0	130	----
Ethylbenzene	100-41-4	E611E	0.5	µg/L	100 µg/L	98.0	70.0	130	----
Hexachlorobutadiene	87-68-3	E611E	1	µg/L	100 µg/L	117	70.0	130	----
Isopropylbenzene	98-82-8	E611E	1	µg/L	100 µg/L	97.8	70.0	130	----
Methyl-tert-butyl ether [MTBE]	1634-04-4	E611E	0.5	µg/L	100 µg/L	111	70.0	130	----
Propylbenzene, n-	103-65-1	E611E	1	µg/L	100 µg/L	95.6	70.0	130	----
Styrene	100-42-5	E611E	0.5	µg/L	100 µg/L	99.9	70.0	130	----
Tetrachloroethane, 1,1,1,2-	630-20-6	E611E	1	µg/L	100 µg/L	119	70.0	130	----
Tetrachloroethane, 1,1,2,2-	79-34-5	E611E	1	µg/L	100 µg/L	112	70.0	130	----
Tetrachloroethylene	127-18-4	E611E	1	µg/L	100 µg/L	105	70.0	130	----
Toluene	108-88-3	E611E	0.5	µg/L	100 µg/L	97.1	70.0	130	----
Trichlorobenzene, 1,2,3-	87-61-6	E611E	1	µg/L	100 µg/L	85.2	70.0	130	----
Trichlorobenzene, 1,2,4-	120-82-1	E611E	1	µg/L	100 µg/L	85.7	70.0	130	----
Trichloroethane, 1,1,1-	71-55-6	E611E	1	µg/L	100 µg/L	111	70.0	130	----
Trichloroethane, 1,1,2-	79-00-5	E611E	1	µg/L	100 µg/L	102	70.0	130	----
Trichloroethylene	79-01-6	E611E	1	µg/L	100 µg/L	93.8	70.0	130	----
Trichlorofluoromethane	75-69-4	E611E	1	µg/L	100 µg/L	112	60.0	140	----
Trichloropropane, 1,2,3-	96-18-4	E611E	1	µg/L	100 µg/L	109	70.0	130	----
Trimethylbenzene, 1,2,4-	95-63-6	E611E	1	µg/L	100 µg/L	109	70.0	130	----
Trimethylbenzene, 1,3,5-	108-67-8	E611E	1	µg/L	100 µg/L	106	70.0	130	----
Vinyl chloride	75-01-4	E611E	1	µg/L	100 µg/L	92.8	60.0	140	----
Xylene, m+p-	179601-23-1	E611E	0.4	µg/L	200 µg/L	101	70.0	130	----
Xylene, o-	95-47-6	E611E	0.3	µg/L	100 µg/L	100	70.0	130	----
Hydrocarbons (QCLot: 1286778)									
F2 (C10-C16)	----	E601	100	µg/L	3820 µg/L	106	70.0	130	----

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Hydrocarbons (QCLot: 1288543)									
F1 (C6-C10)	----	E581.F1	100	µg/L	2750 µg/L	98.9	70.0	130	----

Matrix Spike (MS) Report

A Matrix Spike (MS) is a randomly selected intra-laboratory replicate sample that has been fortified (spiked) with test analytes at known concentration, and processed in an identical manner to test samples. Matrix Spikes provide information regarding analyte recovery and potential matrix effects. MS DQO exceedances due to sample matrix may sometimes be unavoidable; in such cases, test results for the associated sample (or similar samples) may be subject to bias. ND – Recovery not determined, background level >= 1x spike level.

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Anions and Nutrients (QCLot: 1286110)										
FC2303579-007	Anonymous	Ammonia, total (as N)	7664-41-7	E298	0.0999 mg/L	0.1 mg/L	99.9	75.0	125	----
Anions and Nutrients (QCLot: 1286111)										
EO2311633-002	Anonymous	Chloride	16887-00-6	E235.Cl	101 mg/L	100 mg/L	101	75.0	125	----
Anions and Nutrients (QCLot: 1286112)										
EO2311633-002	Anonymous	Fluoride	16984-48-8	E235.F	0.986 mg/L	1 mg/L	98.6	75.0	125	----
Anions and Nutrients (QCLot: 1286113)										
EO2311633-002	Anonymous	Nitrate (as N)	14797-55-8	E235.NO3	2.62 mg/L	2.5 mg/L	105	75.0	125	----
Anions and Nutrients (QCLot: 1286114)										
EO2311633-002	Anonymous	Nitrite (as N)	14797-65-0	E235.NO2	0.410 mg/L	0.5 mg/L	82.1	75.0	125	----
Anions and Nutrients (QCLot: 1286115)										
EO2311633-002	Anonymous	Sulfate (as SO4)	14808-79-8	E235.SO4	95.8 mg/L	100 mg/L	95.8	75.0	125	----
Anions and Nutrients (QCLot: 1288621)										
EO2311598-002	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	2.49 mg/L	2.5 mg/L	99.5	70.0	130	----
Organic / Inorganic Carbon (QCLot: 1287454)										
FC2303579-006	Anonymous	Carbon, dissolved organic [DOC]	----	E358-L	ND mg/L	5 mg/L	ND	70.0	130	----
Organic / Inorganic Carbon (QCLot: 1288194)										
EO2311630-001	23MW38A	Carbon, dissolved organic [DOC]	----	E358-L	ND mg/L	5 mg/L	ND	70.0	130	----
Dissolved Metals (QCLot: 1286997)										
EO2311630-002	23MW38B	Aluminum, dissolved	7429-90-5	E421	0.206 mg/L	0.2 mg/L	103	70.0	130	----
		Antimony, dissolved	7440-36-0	E421	0.0200 mg/L	0.02 mg/L	99.8	70.0	130	----
		Arsenic, dissolved	7440-38-2	E421	0.0218 mg/L	0.02 mg/L	109	70.0	130	----
		Barium, dissolved	7440-39-3	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		Beryllium, dissolved	7440-41-7	E421	0.0422 mg/L	0.04 mg/L	106	70.0	130	----
		Bismuth, dissolved	7440-69-9	E421	0.00871 mg/L	0.01 mg/L	87.1	70.0	130	----
		Boron, dissolved	7440-42-8	E421	ND mg/L	0.1 mg/L	ND	70.0	130	----
		Cadmium, dissolved	7440-43-9	E421	0.00408 mg/L	0.004 mg/L	102	70.0	130	----
		Calcium, dissolved	7440-70-2	E421	ND mg/L	4 mg/L	ND	70.0	130	----
		Cesium, dissolved	7440-46-2	E421	0.00980 mg/L	0.01 mg/L	98.0	70.0	130	----
		Chromium, dissolved	7440-47-3	E421	0.0413 mg/L	0.04 mg/L	103	70.0	130	----

Sub-Matrix: **Water**

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Matrix Spike (MS) Report: Spike Concentration	Spike Target	Recovery (%) MS	Recovery Limits (%) Low	Recovery Limits (%) High	Qualifier
Dissolved Metals (QCLot: 1286997) - continued										
EO2311630-002	23MW38B	Cobalt, dissolved	7440-48-4	E421	0.0206 mg/L	0.02 mg/L	103	70.0	130	----
		Copper, dissolved	7440-50-8	E421	0.0198 mg/L	0.02 mg/L	99.2	70.0	130	----
		Iron, dissolved	7439-89-6	E421	1.94 mg/L	2 mg/L	96.8	70.0	130	----
		Lead, dissolved	7439-92-1	E421	0.0183 mg/L	0.02 mg/L	91.6	70.0	130	----
		Lithium, dissolved	7439-93-2	E421	ND mg/L	0.1 mg/L	ND	70.0	130	----
		Magnesium, dissolved	7439-95-4	E421	ND mg/L	1 mg/L	ND	70.0	130	----
		Manganese, dissolved	7439-96-5	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		Molybdenum, dissolved	7439-98-7	E421	0.0208 mg/L	0.02 mg/L	104	70.0	130	----
		Nickel, dissolved	7440-02-0	E421	0.0386 mg/L	0.04 mg/L	96.4	70.0	130	----
		Phosphorus, dissolved	7723-14-0	E421	11.7 mg/L	10 mg/L	117	70.0	130	----
		Potassium, dissolved	7440-09-7	E421	ND mg/L	4 mg/L	ND	70.0	130	----
		Rubidium, dissolved	7440-17-7	E421	0.0199 mg/L	0.02 mg/L	99.4	70.0	130	----
		Selenium, dissolved	7782-49-2	E421	0.0465 mg/L	0.04 mg/L	116	70.0	130	----
		Silicon, dissolved	7440-21-3	E421	11.2 mg/L	10 mg/L	112	70.0	130	----
		Silver, dissolved	7440-22-4	E421	0.00355 mg/L	0.004 mg/L	88.8	70.0	130	----
		Sodium, dissolved	7440-23-5	E421	ND mg/L	2 mg/L	ND	70.0	130	----
		Strontium, dissolved	7440-24-6	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		Sulfur, dissolved	7704-34-9	E421	ND mg/L	20 mg/L	ND	70.0	130	----
		Tellurium, dissolved	13494-80-9	E421	0.0415 mg/L	0.04 mg/L	104	70.0	130	----
		Thallium, dissolved	7440-28-0	E421	0.00355 mg/L	0.004 mg/L	88.8	70.0	130	----
		Thorium, dissolved	7440-29-1	E421	0.0187 mg/L	0.02 mg/L	93.5	70.0	130	----
		Tin, dissolved	7440-31-5	E421	0.0201 mg/L	0.02 mg/L	100	70.0	130	----
		Titanium, dissolved	7440-32-6	E421	0.0435 mg/L	0.04 mg/L	109	70.0	130	----
		Tungsten, dissolved	7440-33-7	E421	0.0201 mg/L	0.02 mg/L	100	70.0	130	----
		Uranium, dissolved	7440-61-1	E421	ND mg/L	0.004 mg/L	ND	70.0	130	----
		Vanadium, dissolved	7440-62-2	E421	0.109 mg/L	0.1 mg/L	109	70.0	130	----
		Zinc, dissolved	7440-66-6	E421	0.387 mg/L	0.4 mg/L	96.7	70.0	130	----
		Zirconium, dissolved	7440-67-7	E421	0.0407 mg/L	0.04 mg/L	102	70.0	130	----
Dissolved Metals (QCLot: 1287722)										
EO2311604-001	Anonymous	Mercury, dissolved	7439-97-6	E509	0.000100 mg/L	0.0001 mg/L	100	70.0	130	----
Aggregate Organics (QCLot: 1291349)										
CG2317951-005	Anonymous	Phenols, total (4AAP)	----	E562	0.0184 mg/L	0.02 mg/L	92.1	75.0	125	----
Volatile Organic Compounds (QCLot: 1288542)										
EO2311630-002	23MW38B	Benzene	71-43-2	E611A	102 µg/L	100 µg/L	102	50.0	140	----

Sub-Matrix: **Water**

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Matrix Spike (MS) Report: Spike Concentration	Spike Target	Recovery (%) MS	Recovery Limits (%) Low	Recovery Limits (%) High	Qualifier
Volatile Organic Compounds (QCLot: 1288542) - continued										
EO2311630-002	23MW38B	Ethylbenzene	100-41-4	E611A	99.8 µg/L	100 µg/L	99.8	50.0	140	----
		Styrene	100-42-5	E611A	101 µg/L	100 µg/L	101	50.0	140	----
		Toluene	108-88-3	E611A	97.0 µg/L	100 µg/L	97.0	50.0	140	----
		Xylene, m+p-	179601-23-1	E611A	191 µg/L	200 µg/L	95.3	50.0	140	----
		Xylene, o-	95-47-6	E611A	102 µg/L	100 µg/L	102	50.0	140	----
Volatile Organic Compounds (QCLot: 1288544)										
EO2311630-002	23MW38B	Benzene	71-43-2	E611E	102 µg/L	100 µg/L	102	50.0	140	----
		Bromobenzene	108-86-1	E611E	107 µg/L	100 µg/L	107	50.0	140	----
		Bromochloromethane	74-97-5	E611E	101 µg/L	100 µg/L	101	50.0	140	----
		Bromodichloromethane	75-27-4	E611E	100 µg/L	100 µg/L	100	50.0	140	----
		Bromoform	75-25-2	E611E	118 µg/L	100 µg/L	118	50.0	140	----
		Bromomethane	74-83-9	E611E	108 µg/L	100 µg/L	108	50.0	140	----
		Butylbenzene, n-	104-51-8	E611E	103 µg/L	100 µg/L	103	50.0	140	----
		Butylbenzene, sec-	135-98-8	E611E	91.2 µg/L	100 µg/L	91.2	50.0	140	----
		Butylbenzene, tert-	98-06-6	E611E	95.5 µg/L	100 µg/L	95.5	50.0	140	----
		Carbon tetrachloride	56-23-5	E611E	111 µg/L	100 µg/L	111	50.0	140	----
		Chlorobenzene	108-90-7	E611E	106 µg/L	100 µg/L	106	50.0	140	----
		Chloroethane	75-00-3	E611E	87.1 µg/L	100 µg/L	87.1	50.0	140	----
		Chloroform	67-66-3	E611E	110 µg/L	100 µg/L	110	50.0	140	----
		Chloromethane	74-87-3	E611E	90.0 µg/L	100 µg/L	90.0	50.0	140	----
		Chlorotoluene, 2-	95-49-8	E611E	103 µg/L	100 µg/L	103	50.0	140	----
		Chlorotoluene, 4-	106-43-4	E611E	109 µg/L	100 µg/L	109	50.0	140	----
		Cymene, p-	99-87-6	E611E	98.1 µg/L	100 µg/L	98.1	50.0	140	----
		Dibromo-3-chloropropane, 1,2-	96-12-8	E611E	115 µg/L	100 µg/L	115	50.0	140	----
		Dibromochloromethane	124-48-1	E611E	118 µg/L	100 µg/L	118	50.0	140	----
		Dibromoethane, 1,2-	106-93-4	E611E	107 µg/L	100 µg/L	107	50.0	140	----
		Dibromomethane	74-95-3	E611E	99.3 µg/L	100 µg/L	99.3	50.0	140	----
		Dichlorobenzene, 1,2-	95-50-1	E611E	103 µg/L	100 µg/L	103	50.0	140	----
		Dichlorobenzene, 1,3-	541-73-1	E611E	102 µg/L	100 µg/L	102	50.0	140	----
		Dichlorobenzene, 1,4-	106-46-7	E611E	108 µg/L	100 µg/L	108	50.0	140	----
		Dichlorodifluoromethane	75-71-8	E611E	114 µg/L	100 µg/L	114	50.0	140	----
		Dichloroethane, 1,1-	75-34-3	E611E	108 µg/L	100 µg/L	108	50.0	140	----
		Dichloroethane, 1,2-	107-06-2	E611E	106 µg/L	100 µg/L	106	50.0	140	----
		Dichloroethylene, 1,1-	75-35-4	E611E	112 µg/L	100 µg/L	112	50.0	140	----
		Dichloroethylene, cis-1,2-	156-59-2	E611E	89.1 µg/L	100 µg/L	89.1	50.0	140	----

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Volatile Organic Compounds (QCLot: 1288544) - continued										
EO2311630-002	23MW38B	Dichloroethylene, trans-1,2-	156-60-5	E611E	114 µg/L	100 µg/L	114	50.0	140	----
		Dichloromethane	75-09-2	E611E	118 µg/L	100 µg/L	118	50.0	140	----
		Dichloropropane, 1,2-	78-87-5	E611E	104 µg/L	100 µg/L	104	50.0	140	----
		Dichloropropane, 1,3-	142-28-9	E611E	106 µg/L	100 µg/L	106	50.0	140	----
		Dichloropropane, 2,2-	594-20-7	E611E	118 µg/L	100 µg/L	118	50.0	140	----
		Dichloropropylene, 1,1-	563-58-6	E611E	90.2 µg/L	100 µg/L	90.2	50.0	140	----
		Dichloropropylene, cis-1,3-	10061-01-5	E611E	91.2 µg/L	100 µg/L	91.2	50.0	140	----
		Dichloropropylene, trans-1,3-	10061-02-6	E611E	111 µg/L	100 µg/L	111	50.0	140	----
		Ethylbenzene	100-41-4	E611E	99.8 µg/L	100 µg/L	99.8	50.0	140	----
		Hexachlorobutadiene	87-68-3	E611E	124 µg/L	100 µg/L	124	50.0	140	----
		Isopropylbenzene	98-82-8	E611E	95.2 µg/L	100 µg/L	95.2	50.0	140	----
		Methyl-tert-butyl ether [MTBE]	1634-04-4	E611E	119 µg/L	100 µg/L	119	50.0	140	----
		Propylbenzene, n-	103-65-1	E611E	97.1 µg/L	100 µg/L	97.1	50.0	140	----
		Styrene	100-42-5	E611E	101 µg/L	100 µg/L	101	50.0	140	----
		Tetrachloroethane, 1,1,1,2-	630-20-6	E611E	124 µg/L	100 µg/L	124	50.0	140	----
		Tetrachloroethane, 1,1,2,2-	79-34-5	E611E	123 µg/L	100 µg/L	123	50.0	140	----
		Tetrachloroethylene	127-18-4	E611E	108 µg/L	100 µg/L	108	50.0	140	----
		Toluene	108-88-3	E611E	97.0 µg/L	100 µg/L	97.0	50.0	140	----
		Trichlorobenzene, 1,2,3-	87-61-6	E611E	93.2 µg/L	100 µg/L	93.2	50.0	140	----
		Trichlorobenzene, 1,2,4-	120-82-1	E611E	87.2 µg/L	100 µg/L	87.2	50.0	140	----
		Trichloroethane, 1,1,1-	71-55-6	E611E	114 µg/L	100 µg/L	114	50.0	140	----
		Trichloroethane, 1,1,2-	79-00-5	E611E	110 µg/L	100 µg/L	110	50.0	140	----
		Trichloroethylene	79-01-6	E611E	87.7 µg/L	100 µg/L	87.7	50.0	140	----
		Trichlorofluoromethane	75-69-4	E611E	113 µg/L	100 µg/L	113	50.0	140	----
		Trichloropropane, 1,2,3-	96-18-4	E611E	124 µg/L	100 µg/L	124	50.0	140	----
		Trimethylbenzene, 1,2,4-	95-63-6	E611E	101 µg/L	100 µg/L	101	50.0	140	----
		Trimethylbenzene, 1,3,5-	108-67-8	E611E	94.7 µg/L	100 µg/L	94.7	50.0	140	----
		Vinyl chloride	75-01-4	E611E	85.6 µg/L	100 µg/L	85.6	50.0	140	----
		Xylene, m+p-	179601-23-1	E611E	191 µg/L	200 µg/L	95.3	50.0	140	----
		Xylene, o-	95-47-6	E611E	102 µg/L	100 µg/L	102	50.0	140	----

Chain of Custody (COC) / Analytical Request Form

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

Affix ALS barcode label here (lab use only)

COC Number: 17 -

Page of

port To	Contact and company name below will appear on the final report
mpany:	Tetra Tech
ntact:	William Wood
one:	587.986.2709
	Company address below will appear on the final report
eet:	14940 123 Ave NW
y/Province:	Edmonton AB
stal Code:	T5V 1B4
oice To	Same as Report To ☐ YES ☐ NO
	Copy of Invoice with Report ☐ YES ☐ NO
mpany:	Clean Harbors
ntact:	

Report Format / Distribution

Select Report Format: ☑ PDF ☐ EXCEL ☑ EDD (DIGITAL)

Quality Control (QC) Report with Report ☑ YES ☐ NO

☐ Compare Results to Criteria on Report - provide details below if box checked

Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax EBA.labdata@tetratech.com

Email 2 ets.svc.eba_esdat@tetratech.com

Email 3 William.Wood@tetratech.com

Invoice Distribution

Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax William.Wood@tetratech.com

Email 2

Select Service Level Below - Contact your AM to confirm all E&P TATs (surcharges may apply)

Regular [R] ☑ Standard TAT if received by 3 pm - business days - no surcharges apply

PRIORITY (Business Days): 4 day [P4-20%] ☐ 3 day [P3-25%] ☐ 2 day [P2-50%] ☐

EMERGENCY: 1 Business day [E - 100%]; Same Day, Weekend or Statutory holiday [E2 -200% (Laboratory opening fees may apply)]

Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm

For tests that can not be performed according to the service level selected, you will be contacted.

Project Information

S Account # / Quote #: Q83988

#: SWM.SWOP04591-~~03~~ -02

/ AFE:

D:

Oil and Gas Required Fields (client use)

AFE/Cost Center: PO#

Major/Minor Code: Routing Code:

Requisitioner:

Location:

ALS Contact: Sampler: WW

ALS Lab Work Order # (lab use only): EO2311630

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

LS Sample # ab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	Routine Parameters	Dissolved Metals (including Hg)	Nutrients (TKN, Ammonia-N, DOC)	BTEX and F1-F2	Total Phenols	VOC, TCE and PCE	SAMPLES ON HOLD
	23MW38A	21-Dec-23	10:30	Water	8	R	R	R	R	R	R	
	23MW38B	21-Dec-23	10:13	Water	8	R	R	R	R	R	R	
				Water								
				Water								
				Water								
				Water								
				Water								
				Water								
			-	Water								
				Water								
				Water								
				Water								

Drinking Water (DW) Samples[1] (client use)

samples taken from a Regulated DW System? ☐ YES ☐ NO

samples for human consumption/ use? ☐ YES ☐ NO

Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)

Dissolved metals field filtered. ~~and~~ Dissolved nutrients FF and preserved

Please include ESdat EDD deliverable

Dissolved metals not field preserved.

SAMPLE CONDITION AS

Frozen ☐ SIF Observation

Ice Packs ☑ Ice Cubes ☑ Custody seal int

Cooling Initiated ☐

INITIAL COOLER TEMPERATURES °C: 3.6

SHIPMENT RELEASE (client use)

eleased by: William Wood Date: Dec 21, 2023 Time: 12:40

INITIAL SHIPMENT RECEPTION (lab use only)

Received by: VA Date: 21-Dec-2023 Time: 12:50

FINAL SHIPMEN

Received by: Date

Environmental Division Edmonton

Work Order Reference

EO2311630

Telephone : +1 780 413 5227

FER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

ure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

any water samples are taken from a **Regulated Drinking Water (DW) System**, please submit using an **Authorized DW COC form**.

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	1000	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	128-429 [2]	2171	2030	2400	2460	2460	2450	2350	2420	2590	2681	2670	2570	2830	3010	2510	3330	2950	3460	3330	3490
Chloride	mg/L	100	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	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<6	<6
Nitrate	mg/L	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	<0.05	0.16	0.213	<0.04
Total Dissolved Solids (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	0.018-190 [3]	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	0.00004- 0.00037 [2]	*<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	0.007	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	0.001- 0.007 [2]	*<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	0.000005	*<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	0.007- 0.17	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	0.03	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] Alberta Environment and Parks (AEP). 2019. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. 198 pp. Referenced guidelines are for fine textured soils under Agricultural land use

[2] Guideline varies with hardness

[3] Guideline varies with pH and temperature

"-" No applicable guideline or not analyzed

Exceeds Regulatory Limit

Italic - Detection limit greater than Tier 1 Guideline

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
Field Measurements										
Field pH	-	-	-	8.4	8.5	-	8.3	7.12	7.73	7.2
Field EC	mS	-	-	-	-	-	-	-	-	-
Field Temperature	°C	-	-	-	-	-	-	-	-	-
Routine Water										
pH	-	6.5 - 8.5	-	8.38	8.23	8.39	8.47	8.05	8.06	8.16
Conductivity (EC)	µS/cm	1000	-	5160	3410	2790	2600	4620	4970	6340
Calcium	mg/L	-	-	72.7	15.3	17.7	10.6	44.2	49.5	72.9
Magnesium	mg/L	-	-	12.7	2.1	5.8	2.9	8.4	7.9	9.3
Sodium	mg/L	200	-	1300	819	843	685	1240	1390	1900
Potassium	mg/L	-	-	7.59	3.32	8.38	4.51	8.98	5.18	5.97
Iron	mg/L	0.3	-	0.08	0.15	5.04	0.268	3.9	0.387	-
Sulphate	mg/L	128-429 [2]	-	2420	1020	935	573	1950	2430	3620
Chloride	mg/L	100	-	4.5	8.2	9.4	12.9	7.5	4.8	8.5
Bicarbonate	mg/L	-	-	625	880	959	946	862	805	696
Carbonate	mg/L	-	-	-	-	-	-	-	-	-
Hydroxide	mg/L	-	-	-	-	-	-	-	-	-
Nitrate (N)	mg/L	3	-	-	-	-	-	3.1	3.54	1.92
Nitrite (N)	mg/L	0.02 - 0.20 [3]	-	-	-	-	-	-	-	-
Nitrate and Nitrate (N)	mg/L	-	-	-	-	-	-	-	-	-
Total Dissolved Solids (TDS)	mg/L	500	-	4120	2300	2300	1790	3680	4280	5950
Hardness	mg/L	-	-	-	-	-	-	-	-	-
Alkalinity (total as CaCO3)	mg/L	-	-	-	-	-	-	-	-	-
Alkalinity (pp as CaCO3)	mg/L	-	-	-	-	-	-	-	-	-
Ionic Balance	N/A	-	-	-	-	-	-	-	-	-
Water Nutrients										
Ammonia-N	mg/L	0.018-190 [4]	-	1.28	0.831	0.56	0.82	1.17	1.6	1.97
TKN	mg/L	-	-	9.09	5.77	2.92	2.74	2.44	2.54	3.68
Hydrocarbons										
Benzene	mg/L	0.005	-	-	-	-	-	-	-	-
Toluene	mg/L	0.024	-	-	-	-	-	-	-	-
Ethylbenzene	mg/L	0.0016	-	-	-	-	-	-	-	-
Xylene	mg/L	0.02	-	-	-	-	-	-	-	-
F1 (C6-C10) - BTEX	mg/L	2.2	-	-	-	-	-	-	-	-
F2 (>C10-C16)	mg/L	1.1	-	-	-	-	-	-	-	-
Organics										
COD	mg/L	-	-	295	421	156	147	102	65	17
TOC	mg/L	-	-	38.4	18.1	12.9	31.2	13.1	18.6	19.8
DOC	mg/L	-	-	-	-	-	-	-	-	-
Oil & Grease	mg/L	-	-	-	-	-	1	-	< 1	-
Metals										
Aluminum	mg/L	0.0007 / 0.05 [5]	-	-	-	-	-	-	-	-
Antimony	mg/L	0.006	-	< 0.005	< 0.005	-	< 0.005	-	< 0.005	-
Arsenic	mg/L	0.005	-	-	-	-	-	-	-	-
Barium	mg/L	1	-	0.0343	0.0524	-	0.0331	-	0.0351	-
Beryllium	mg/L	-	-	-	-	-	-	-	-	-
Boron	mg/L	1	-	-	-	-	-	-	-	-
Cadmium	mg/L	0.00004-0.00037 [2]	-	< 0.0005	< 0.0005	-	< 0.0005	-	< 0.005	-
Chromium	mg/L	0.05	-	0.0012	0.0015	-	0.0012	-	< 0.0008	-
Cobalt	mg/L	-	-	0.0035	0.0031	-	< 0.0007	-	0.0043	-
Copper	mg/L	0.007	-	0.002	0.01	-	0.006	-	0.004	-
Lead	mg/L	0.001-0.007 [2]	-	< 0.002	0.003	-	0.003	-	< 0.002	-
Lithium	mg/L	-	-	-	-	-	-	-	-	-
Manganese	mg/L	0.05	-	-	-	-	-	-	-	-
Mercury	mg/L	0.000005	-	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	-	-
Molybdenum	mg/L	-	-	0.038	0.023	-	0.012	-	0.01	-
Nickel	mg/L	0.007-0.170 [2]	-	0.017	0.007	-	0.004	-	0.005	-
Phosphorus	mg/L	-	-	-	-	-	-	-	-	-
Selenium	mg/L	0.002	-	-	-	-	-	-	-	-
Silicon	mg/L	-	-	-	-	-	-	-	-	-
Silver	mg/L	0.0001	-	-	-	-	-	-	-	-
Strontium	mg/L	-	-	-	-	-	-	-	-	-
Sulphur	mg/L	-	-	-	-	-	-	-	-	-
Thallium	mg/L	-	-	-	-	-	-	-	-	-
Tin	mg/L	-	-	-	-	-	-	-	-	-
Titanium	mg/L	-	-	-	-	-	-	-	-	-
Uranium	mg/L	0.01	-	-	-	-	-	-	-	-
Vanadium	mg/L	-	-	-	-	-	-	-	-	-
Zinc	mg/L	0.03	-	0.0116	0.0013	-	0.0017	-	0.0018	-

Parameter ID	MW 1B															
	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
Field Measurements																
Field pH	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
Field EC	-	-	-	-	-	-	-	-	-	-	8.6	21.5 (EF)	7.93	6.86	13.04	10.24
Field Temperature	-	-	-	-	-	-	-	-	-	-	8.4	3.2	6.8	6.2	8.3	9.11
Routine Water																
pH	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
Conductivity (EC)	6960	7420	7140	7860	7190	7960	7190	8450	9150	8840	8320	8430	6540	6840	5830	4900
Calcium	99.9	149	109	152	115	143	124	208	249	172	186	149	105	99.2	67.1	46.4
Magnesium	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
Sodium	1800	2130	1970	2190	2100	2290	1850	2420	2420	2270	2180	2150	1730	1750	1470	1260
Potassium	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
Iron	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
Sulphate	3590	4410	3860	4480	4350	5050	4030	5240	5320	4880	4240	4540	3240	3220	2360	1830
Chloride	1.5	0.9	< 0.5	0.9	0.5	1.7	1.9	1.3	1	2	1	2	4	4	4	6
Bicarbonate	737	667	640	634	635	653	684	651	644	673	669	673	780	750	889	984
Carbonate	<6	<6	<6	<6	<6	<6	<6	<6	<5	<5	<5	<5	<5	6	<5	<5
Hydroxide	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrate (N)	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
Nitrite (N)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrate and Nitrate (N)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Dissolved Solids (TDS)	5880	7700	6280	7160	6910	7840	6360	8230	8390	7700	6980	7240	5510	5490	4370	3710
Hardness	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Alkalinity (total as CaCO3)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Alkalinity (pp as CaCO3)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ionic Balance	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Water Nutrients																
Ammonia-N	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
TKN	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
Hydrocarbons																
Benzene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Toluene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Xylene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F1 (C6-C10) - BTEX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F2 (>C10-C16)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Organics																
COD	15	74	83	82	235	84	239	114	100	80	95	73	76	90	49	38
TOC	19	30.1	1.2	35	34.4	34.8	25.4	35.9	36	36	35	31	26	20	18	15
DOC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Oil & Grease	1	2	< 5	< 5	6	10	< 1	< 5	< 1	< 1	<1	<1	3	<1	<1	<1
Metals																
Aluminum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Antimony	< 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
Arsenic	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Barium	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
Beryllium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Boron	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cadmium	< 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
Chromium	< 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
Cobalt	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
Copper	< 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
Lead	0.005	< 0.002	*< 0.01*	*< 0.01*	< 0.002	0.0008	< 0.001	0.0004	< 0.005	< 0.005	<0.0001	<0.0001	0.0005	<0.0001	<0.0001	<0.0001
Lithium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Manganese	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mercury	*< 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*
Molybdenum	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
Nickel	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
Phosphorus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Selenium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silicon	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silver	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Strontium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sulphur	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Thallium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tin	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Titanium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Uranium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vanadium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Zinc	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

Parameter ID	MW 1B				MW 1B								
	May-08	May-09	Jun-10	Jun-11	May-12	Jun-13	Jun-14	May-15	Jun-16	Jun-17	Jun-18	Jun-19	Jun-20
Field Measurements													
Field pH	7.664	7.800	8.11	7.67	7.61	6.17	9.9	8.4	6.33	-	-	8.10	7.91
Field EC	5.480	3.096	3.3	3.08	2.47	4.11	2.95	3.05	3.67	-	-	2.36	2.48
Field Temperature	5.1	11.7	21.9	8	7.7	8.2	7.5	8.3	-	-	-	10.3	8.4
Routine Water													
pH	8.2	8.29	8.23	8.32	8.44	8.41	8.05	8.24	8.44	8.54	8.29	8.54	8.43
Conductivity (EC)	4420	5000	4020	2900	3700	3,200	2800	2900	2700	2900	2500	2300	2500
Calcium	43.5	43.2	25.3	13	19	14	12	12	10	12	9.1	7.9	10
Magnesium	7.9	6.26	3.61	1.9	2.8	2	1.7	1.6	1.3	1.6	1.1	0.91	1.3
Sodium	1100	1170	941	750	890	730	740	740	680	670	620	570	630
Potassium	2.4	3.82	3.51	2.2	3.6	2.6	2.5	2.4	2.1	2.2	2.2	2.0	2.2
Iron	<0.005	<0.0050	0.024	<0.06	<0.060	<0.060	0.64	<0.060	<0.060	<0.060	<0.06	<0.060	0.62
Sulphate	1590	1960	1270 *	670	1200	860	680	680	540	610	390	300	430
Chloride	6	3.8	<10 *	6	4.8	5.2	5.1	6.1	6.1	6.2	9.6	5.9	6.2
Bicarbonate	1030	915	1010	1100	1000	1,000	1100	1100	1100	1000	1100	1100	1000
Carbonate	<5	<5.0	<5.0	8.4	15	16	<0.50	<0.50	13	21	<1.0	43	16
Hydroxide	-	-	-	-	-	-	-	<0.50	<0.50	<0.5	<1.0	<1.0	<1.0
Nitrate (N)	4.9	3.81	4.7 *	2.2	5	5.3	3.7	0.89	1.1	13	3.3	0.79	0.8
Nitrite (N)	-	-	-	-	-	-	-	0.016	0.019	<0.033	0.037	0.069	0.025
Nitrate and Nitrate (N)	-	-	-	-	-	-	-	0.91	1.1	2.8	3.3	0.86	0.82
Total Dissolved Solids (TDS)	3280	3650	2670	2000	2700	2,200	2000	2000	1800	1800	1600	1500	1600
Hardness	-	-	-	-	-	-	-	37	30	35	27	23	30
Alkalinity (total as CaCO3)	-	-	-	-	-	-	-	880	900	890	940	960	870
Alkalinity (pp as CaCO3)	-	-	-	-	-	-	-	<0.50	10	17		36	-
Ionic Balance	-	-	-	-	-	-	-	1.0	1.0	1.9	0.52	0.31	3.2
Water Nutrients													
Ammonia-N	0.14	0.823	0.43	0.41	0.47	0.36	<0.050	0.26	0.36	-	0.2	0.30	0.3
TKN	1.7	2.34	2.63	2.2	2.8	2.4	2.2*	1.6	0.96	-	3.2	4.0	2.9
Hydrocarbons													
Benzene	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene	<0.00050	<0.00050	<0.0010	<0.0008	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00089	<0.00089	<0.00089
F1 (C6-C10) - BTEX	<0.1	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	<0.05	<0.050	<0.25	<0.1	<0.75	<0.10	<0.10	<0.10	<0.10	<0.27	<0.10	<0.10	<0.10
Organics													
COD	33	44	32.7	33	120	270	98	120	47	-	130	250	135
TOC	-	-	-	-	-	-	-	-				-	-
DOC	14	15.5	12.6	14	13	11	9.9	10	8.8	11	9.3	8.5	12
Oil & Grease	-	-	-	-	-	-	-	-				-	-
Metals													
Aluminum	-	-	-	-	-	-	-	0.0044	0.061	0.059	0.003	0.034	0.25
Antimony	-	-	0.00047	<0.006	<0.00060	0.00064	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic	-	-	-	-	-	-	-	0.0012	0.0015	0.00098	0.0012	0.00092	0.0013
Barium	0.016	0.0119	0.0225	0.017	0.015	0.017	0.039	0.017	0.021	0.024	0.03	0.036	0.049
Beryllium	-	-	-	-	-	-	-	<0.001	<0.0010	<0.001		<0.0010	-
Boron	-	-	-	-	-	-	-	0.63	0.62	0.64	0.72	0.73	0.72
Cadmium	<0.001	<0.0010	<0.000050	<0.000050	0.000038	0.000057	<0.000025	0.000029	0.000029	0.000022	<0.00002	<0.000020	0.000027
Chromium	<0.005	<0.0050	<0.0050	<0.01	<0.0010	<0.0010	0.0034	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Cobalt	<0.002	<0.0020	<0.0020	<0.003	0.00066	0.00068	0.001	0.00058	0.00083	0.00099	<0.00030	0.00037	-
Copper	0.004	0.005	0.0084	<0.002	0.0008	0.0032	0.0057	0.0020	0.0035	0.0018	0.0021	0.00075	0.0065
Lead	<0.005	<0.0050	0.0003	<0.002	<0.00020	<0.00020	0.00056	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00063
Lithium	-	-	-	-	-	-	-	0.14	0.13	0.14		0.12	-
Manganese	-	-	-	-	-	-	-	0.10	0.057	0.095	0.027	0.075	0.1
Mercury	*<0.0001*	*<0.00010*	*<0.00010*	<0.000005	<3E - 06	<3E - 07	0.00003	<0.0000050	<0.0000020	<0.0000020	0.0000021	<0.0000020	0.00013
Molybdenum	0.019	0.0061	0.0062	0.011	0.0095	0.011	0.0085	0.0082	0.0084	0.0075	0.0073	0.0069	-
Nickel	0.004	0.005	0.0072	<0.005	0.004	0.0053	0.0068	0.0038	0.0060	0.0056	0.0044	0.0037	0.0048
Phosphorus	-	-	-	-	-	-	-	0.13	0.11	<0.1	-	<0.10	-
Selenium	-	-	-	-	-	-	-	<0.00020	0.00058	0.00035	0.00023	0.00021	<0.00020
Silicon	-	-	-	-	-	-	-	2.5	2.2	2.7		2.9	-
Silver	-	-	-	-	-	-	-	<0.00010	<0.00010	<0.0001	<0.00010	<0.00010	<0.00010
Strontium	-	-	-	-	-	-	-	0.29	0.25	0.26		0.17	-
Sulphur	-	-	-	-	-	-	-	200	150	190		110	-
Thallium	-	-	-	-	-	-	-	<0.00020	<0.00020	<0.0002		<0.00020	-
Tin	-	-	-	-	-	-	-	<0.0010	<0.0010	<0.001		<0.0010	-
Titanium	-	-	-	-	-	-	-	<0.0010	0.0018	<0.001		0.001	-
Uranium	-	-	-	-	-	-	-	0.0019	0.0022	0.0020	0.0018	0.0016	0.0015
Vanadium	-	-	-	-	-	-	-	<0.0010	0.0012	<0.001	<0.0030	<0.0010	-
Zinc	0.01	0.0052	0.0068	<0.03	<0.0030	0.0078	0.0034	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030

Notes:

[1] Alberta Environment and Parks (AEP). 2019. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. 198 pp. Referenced guidelines are for fine textured soils under Agricultural land use

[2] Guideline varies with hardness

[3] Guideline varies with chloride

[4] Guideline varies with pH and temperature

[5] Guideline varies with pH

"-" No applicable guideline or not analyzed

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Italic - Detection limit greater than Tier 1 Guideline

TETRA TECH

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	Jun-18	Jun-19	Jun-20
Volatile Organic Compounds (VOCs)																																												
Bromodichloromethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Bromoform	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Bromomethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	
Carbon tetrachloride	mg/L	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Chlorobenzene	mg/L	0.0013	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Chloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	
Chloroform	mg/L	0.08	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Chloromethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	
Dibromochloromethane	mg/L	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	<0.0010
1,2-Dibromoethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00020	
1,2-Dichlorobenzene	mg/L	0.0007	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,3-Dichlorobenzene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,4-Dichlorobenzene	mg/L	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,1-Dichloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,2-Dichloroethane	mg/L	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,1-Dichloroethene	mg/L	0.014	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,2-Dichloroethene (cis)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,2-Dichloroethene (trans)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,2-Dichloropropane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,3-Dichloropropene [cis]	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,3-Dichloropropene [trans]	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0050	
Methyl t-Butyl Ether (MTBE)	mg/L	0.015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Methylene Chloride	mg/L	0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	<0.0020
Methyl Methacrylate	mg/L	0.47	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Styrene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,1,1,2-Tetrachloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	
1,1,2,2-Tetrachloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	
Tetrachloroethene	mg/L	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,2,3-Trichlorobenzene	mg/L	0.008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	<0.0010
1,2,4-Trichlorobenzene	mg/L	0.015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	<0.0010
1,3,5-Trichlorobenzene	mg/L	0.014	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,1,1-Trichloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,1,2-Trichloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Trichloroethene	mg/L	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Trichlorofluoromethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Trihalomethanes	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0013	<0.0013
1,2,4-Trimethylbenzene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,3,5-Trimethylbenzene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Vinyl chloride	mg/L	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050

Notes:

[1] Alberta Environment and Parks (AEP). 2019. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. 198 pp. Referenced guidelines are for fine textured soils under Agricultural land use

[2] Guideline varies with hardness
[3] Guideline varies with chloride
[4] Guideline varies with pH and temperature
[5] Guideline varies with pH
"-" No applicable guideline or not analyzed
Equipment Failure, parameter not reported (EF)
Detection limit adjusted (*)
Exceeds Regulatory Limit
Italic - Detection limit greater than Tier 1 Guideline

Table E8A: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 8A							
			Jun-13	May-14	May-15	Jun-16	Jun-17	Jun-18	Jun-19	Jun-20
Field Measurements										
Field pH	-	-	7.14	8.5	8.5	8.51	8.5	7.84	8.15	8.21
Field EC	mS	-	4.92	2.56	2.91	2.51	2.67	2.63	2.82	2480
Field Temperature	°C	-	6.1	5.4	6.0	8.7	8.4	6.9	12.2	9.5
Routine Water										
pH	-	6.5 - 8.5	8.45	8.67	8.32	8.49	8.49	8.48	8.44	8.48
Conductivity (EC)	µS/cm	1000	4100	2400	2700	2400	2500	2400	2800	2400
Calcium	mg/L	-	25	7.7	7.6	7.8	8.3	7.1	10	7.3
Magnesium	mg/L	-	7.3	1.7	1.5	1.3	1.3	1	1.4	0.93
Sodium	mg/L	200	930	610	670	600	630	650	680	630
Potassium	mg/L	-	3.7	2.2	2.1	2.3	2.4	2	2.3	1.7
Iron	mg/L	0.3	<0.060	0.31	<0.060	<0.060	<0.060	<0.06	<0.060	
Sulphate	mg/L	128-429 [2]	1300	300	450	290	360	270	550	230
Chloride	mg/L	100	9.8	8.0	7.6	7.4	7.1	7.3	7.5	7.7
Bicarbonate	mg/L	-	1200	1300	1300	1200	1300	1300	1300	1200
Carbonate	mg/L	-	26	49	3.0	25	21	27	34	24
Hydroxide	mg/L	-	-	-	<0.50	<0.50	<0.5	<1.0	<1.0	<1.0
Nitrate (N)	mg/L	3	0.017	<0.010	<0.010	<0.010	<0.044	<0.020	0.029	0.044
Nitrite (N)	mg/L	0.02 - 0.20 [3]	-	-	0.012	<0.010	<0.033	<0.010	0.027	0.016
Nitrate and Nitrate (N)	mg/L	-	-	-	0.012	<0.020	<0.01	<0.020	0.056	0.06
Total Dissolved Solids (TDS)	mg/L	500	2900	1600	1800	1500	1700	1600	1900	1500
Hardness	mg/L	-	-	-	25	25	26	22	31	22
Alkalinity (total as CaCO3)	mg/L	-	-	-	1100	1000	1100	1100	1100	1000
Alkalinity (pp as CaCO3)	mg/L	-	-	-	2.5	21	17		28	-
Ionic Balance	N/A	-	-	-	0.97	1.0	2.2	1.4	5.1	3.9
Water Nutrients										
Ammonia-N	mg/L	0.018-190 [4]	1.1	0.89	0.96	0.81	0.63	0.72	0.76	0.83
TKN	mg/L	-	1.9	1.5	1.6	1.1	1.3	1.4	1.3	1.5
Hydrocarbons										
Benzene	mg/L	0.005	<0.00040	<0.00040	<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	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	<0.00040	<0.00040	<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	<0.00089	<0.00089	<0.00089
F1 (C6-C10)	mg/L	2.2	<0.10	<0.10	<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	<0.10	<0.10
Organics										
COD	mg/L	-	79	68	71	36	40	51	46	34
TOC	mg/L	-	-	-	-	-	-	-	-	-
DOC	mg/L	-	11	9	10	11	12	12	14	12
Oil & Grease	mg/L	-	-	-	-	-	-	-	-	-
Metals										
Aluminum	mg/L	0.0007 / 0.05 [5]	-	-	0.0043	0.0093	0.0088	0.0079	0.0050	0.0041
Antimony	mg/L	0.006	0.00081	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic	mg/L	0.005	-	-	0.0014	0.0021	0.0019	0.0027	0.0032	0.0039
Barium	mg/L	1	0.04	0.041	0.025	0.045	0.049	0.044	0.050	0.04
Beryllium	mg/L	-	-	-	<0.0010	<0.0010	<0.001	-	<0.0010	-
Boron	mg/L	1	-	-	0.68	0.72	0.77	0.73	0.76	0.67
Cadmium	mg/L	0.00004-0.00037 [2]	0.000035	<0.000025	<0.000020	<0.000020	<0.000020	<0.00002	<0.000020	<0.000020
Chromium	mg/L	0.05	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Cobalt	mg/L	-	0.0012	0.0014	0.00033	0.00046	0.00032	<0.00030	0.00036	-
Copper	mg/L	0.007	0.0017	0.00047	0.00064	0.00042	<0.00020	0.00055	0.00097	0.00058
Lead	mg/L	0.001-0.007 [2]	<0.00020	<0.0002	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	-
Lithium	mg/L	-	-	-	0.12	0.11	-	-	0.12	-
Manganese	mg/L	0.05	-	-	0.017	0.015	0.025	0.042	0.10	0.08
Mercury	mg/L	0.000005	<0.0000050	<0.0000050	<0.0000050	<0.0000020	<0.0000020	0.0000025	<0.0000020	<0.0000019
Molybdenum	mg/L	-	0.012	0.00036	0.0057	0.0070	0.0062	0.0067	0.0071	0.0008
Nickel	mg/L	0.007-0.170 [2]	0.005	0.0023	0.0020	0.0023	0.0011	0.0012	0.0010	0.0008
Phosphorus	mg/L	-	-	-	0.19	0.10	0.15	-	0.15	-
Selenium	mg/L	0.002	-	-	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Silicon	mg/L	-	-	-	3.4	3.6	3.8	-	4.0	-
Silver	mg/L	0.0001	-	-	<0.00010	<0.00010	<0.0001	<0.00010	<0.00010	<0.00010
Strontium	mg/L	-	-	-	0.20	0.17	0.19	-	0.22	-
Sulphur	mg/L	-	-	-	120	100	110	-	150	-
Thallium	mg/L	-	-	-	<0.00020	<0.00020	<0.0002	-	<0.00020	-
Tin	mg/L	-	-	-	<0.0010	<0.0010	<0.001	-	<0.0010	-
Titanium	mg/L	-	-	-	<0.0010	<0.0010	<0.001	-	<0.0010	-
Uranium	mg/L	0.01	-	-	0.00071	0.00092	0.00074	0.00056	0.00055	0.0005
Vanadium	mg/L	-	-	-	0.0042	0.0028	0.0022	<0.0030	0.0014	-
Zinc	mg/L	0.03	0.012	0.007	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030

Notes:

[1] Alberta Environment and Parks (AEP). 2019. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. 198 pp. Referenced guidelines are for fine textured soils under Agricultural land use

[2] Guideline varies with hardness

[3] Guideline varies with chloride

[4] Guideline varies with pH and temperature

[5] Guideline varies with pH

"-" No applicable guideline or not analyzed

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Table E8A: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 8A							
			Jun-13	May-14	May-15	Jun-16	Jun-17	Jun-18	Jun-19	Jun-20
Volatile Organic Compounds (VOCs)										
Bromodichloromethane	mg/L	-	-	-	-	-	-	-	<0.00050	
Bromoform	mg/L	-	-	-	-	-	-	-	<0.00050	
Bromomethane	mg/L	-	-	-	-	-	-	-	<0.0020	
Carbon tetrachloride	mg/L	0.002	-	-	-	-	-	-	<0.00050	<0.00050
Chlorobenzene	mg/L	0.0013	-	-	-	-	-	-	<0.00050	<0.00050
Chloroethane	mg/L	-	-	-	-	-	-	-	<0.0010	
Chloroform	mg/L	0.08	-	-	-	-	-	-	<0.00050	<0.00050
Chloromethane	mg/L	-	-	-	-	-	-	-	<0.0020	
Dibromochloromethane	mg/L	0.1	-	-	-	-	-	-	<0.0010	<0.0010
1,2-Dibromoethane	mg/L	-	-	-	-	-	-	-	<0.00020	
1,2-Dichlorobenzene	mg/L	0.0007	-	-	-	-	-	-	<0.00050	<0.00050
1,3-Dichlorobenzene	mg/L	-	-	-	-	-	-	-	<0.00050	
1,4-Dichlorobenzene	mg/L	0.001	-	-	-	-	-	-	<0.00050	<0.00050
1,1-Dichloroethane	mg/L	-	-	-	-	-	-	-	<0.00050	
1,2-Dichloroethane	mg/L	0.005	-	-	-	-	-	-	<0.00050	<0.00050
1,1-Dichloroethene	mg/L	0.014	-	-	-	-	-	-	<0.00050	<0.00050
1,2-Dichloroethene (cis)	mg/L	-	-	-	-	-	-	-	<0.00050	
1,2-Dichloroethene (trans)	mg/L	-	-	-	-	-	-	-	<0.00050	
1,2-Dichloropropane	mg/L	-	-	-	-	-	-	-	<0.00050	
1,3-Dichloropropene [cis]	mg/L	-	-	-	-	-	-	-	<0.00050	
1,3-Dichloropropene [trans]	mg/L	-	-	-	-	-	-	-	<0.00050	
Methyl t-Butyl Ether (MTBE)	mg/L	0.015	-	-	-	-	-	-	<0.00050	<0.00050
Methylene Chloride	mg/L	0.05	-	-	-	-	-	-	<0.0020	<0.0020
Methyl Methacrylate	mg/L	0.47	-	-	-	-	-	-	<0.00050	<0.00050
Styrene	mg/L	-	-	-	-	-	-	-	<0.00050	
1,1,1,2-Tetrachloroethane	mg/L	-	-	-	-	-	-	-	<0.0010	
1,1,2,2-Tetrachloroethane	mg/L	-	-	-	-	-	-	-	<0.0020	
Tetrachloroethene	mg/L	0.01	-	-	-	-	-	-	<0.00050	<0.00050
1,2,3-Trichlorobenzene	mg/L	0.008	-	-	-	-	-	-	<0.0010	<0.0010
1,2,4-Trichlorobenzene	mg/L	0.015	-	-	-	-	-	-	<0.0010	<0.0010
1,3,5-Trichlorobenzene	mg/L	0.014	-	-	-	-	-	-	<0.00050	<0.00050
1,1,1-Trichloroethane	mg/L	-	-	-	-	-	-	-	<0.00050	
1,1,2-Trichloroethane	mg/L	-	-	-	-	-	-	-	<0.00050	
Trichloroethene	mg/L	0.005	-	-	-	-	-	-	<0.00050	<0.00050
Trichlorofluoromethane	mg/L	-	-	-	-	-	-	-	<0.00050	
Trihalomethanes	mg/L	-	-	-	-	-	-	-	<0.0013	<0.0013
1,2,4-Trimethylbenzene	mg/L	-	-	-	-	-	-	-	<0.00050	
1,3,5-Trimethylbenzene	mg/L	-	-	-	-	-	-	-	<0.00050	
Vinyl chloride	mg/L	0.002	-	-	-	-	-	-	<0.00050	<0.00050

Notes:

[1] Alberta Environment and Parks (AEP). 2019. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. 198 pp. Referenced guidelines are for fine textured soils under Agricultural land use

[2] Guideline varies with hardness

[3] Guideline varies with chloride

[4] Guideline varies with pH and temperature

[5] Guideline varies with pH

"-" No applicable guideline or not analyzed

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Table E8B: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 8B							
			Jun-13	May-14	May-15	Jun-16	Jun-17	Jun-18	Jun-19	Jun-20
Field Measurements										
Field pH	-	-	6.57	7.6	8	7.73	7.8	7.5	7.72	7.62
Field EC	mS	-	10.05	8.96	9.28	8.94	9.25	8.88	8.01	7.73
Field Temperature	°C	-	7.4	4.0	6.6	6.8	5.8	7.8	14.0	10.2
Routine Water										
pH	-	6.5 - 8.5	8.31	8.37	7.95	8.19	8.17	8.16	8.14	8.3
Conductivity (EC)	µS/cm	1000	8800	8500	8700	8700	8800	8400	8100	8000
Calcium	mg/L	-	92	110	90	97	97	88	86	74
Magnesium	mg/L	-	48	62	56	54	57	52	41	40
Sodium	mg/L	200	2100	2300	2200	2000	2100	2100	2000	2000
Potassium	mg/L	-	5.8	5.4	6.2	6.7	6.7	6.8	<30	5.1
Iron	mg/L	0.3	<0.060	<0.60	<0.60	<0.060	<0.60	<0.60	*<0.60*	0.077
Sulphate	mg/L	128-429 [2]	4300	4500	4200	3900	3900	3800	3200	2800
Chloride	mg/L	100	23	23	26	28	30	38	43	62
Bicarbonate	mg/L	-	1100	1100	1100	1100	1100	1200	1200	1200
Carbonate	mg/L	-	7.2	18	<0.50	<0.50	<0.50	<1.0	<1.0	<1.0
Hydroxide	mg/L	-	-	-	<0.50	<0.50	<0.5	<1.0	<1.0	<1.0
Nitrate (N)	mg/L	3	0.022	0.074	0.12	0.10	1.5	0.17	0.11	0.11
Nitrite (N)	mg/L	0.02 - 0.20 [3]	-	-	<0.010	<0.050	<0.16	0.03	<0.10	0.034
Nitrate and Nitrate (N)	mg/L	-	-	-	0.12	0.10	0.35	0.2	<0.14	0.15
Total Dissolved Solids (TDS)	mg/L	500	7100	7600	7100	6600	6800	6700	6000	5600
Hardness	mg/L	-	-	-	460	460	480	430	380	350
Alkalinity (total as CaCO3)	mg/L	-	-	-	910	870	940	1000	1000	1000
Alkalinity (pp as CaCO3)	mg/L	-	-	-	<0.50	<0.50	<0.5		<1.0	
Ionic Balance	N/A	-	-	-	1.0	0.97	0.098	0.79	2.8	7.8
Water Nutrients										
Ammonia-N	mg/L	0.018-190 [4]	0.61	0.57	0.69	0.62	0.38	0.49	0.59	0.48
TKN	mg/L	-	1.7	1.4	1.6	1.3	1.3	1.4	1.4	1.6
Hydrocarbons										
Benzene	mg/L	0.005	<0.00040	<0.00040	<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	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	<0.00040	<0.00040	<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	<0.00089	<0.00089	<0.00089
F1 (C6-C10)	mg/L	2.2	<0.10	<0.10	<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	<0.10	<0.10
Organics										
COD	mg/L	-	75	39	48	47	44	44	51	52
TOC	mg/L	-	-	-	-	-	-	-	-	-
DOC	mg/L	-	13	13	14	15	16	15	17	17
Oil & Grease	mg/L	-	-	-	-	-	-	-	-	-
Metals										
Aluminum	mg/L	0.0007 / 0.05 [5]	-	-	<0.030	0.0050	0.0600	0.0045	0.0047	<0.0030
Antimony	mg/L	0.006	<0.006	<0.0060	<0.0060	<0.00060	<0.00060	<0.00072	<0.00060	<0.00060
Arsenic	mg/L	0.005	-	-	0.0021	0.0015	0.0013	0.0012	0.0014	0.0011
Barium	mg/L	1	0.025	<0.10	<0.10	0.013	<0.10	<0.10	<1.0	0.01
Beryllium	mg/L	-	-	-	<0.010	<0.0010	<0.001	-	<0.0010	
Boron	mg/L	1	-	-	0.41	0.41	0.40	0.41	0.48	0.35
Cadmium	mg/L	0.00004-0.00037 [2]	0.000096	<0.000050	<0.00020	0.00003	<0.000020	0.000021	<0.000020	<0.000020
Chromium	mg/L	0.05	<0.010	<0.010	<0.010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Cobalt	mg/L	-	<0.0030	<0.0030	<0.0030	0.0011	0.00095	0.00087	0.00077	
Copper	mg/L	0.007	<0.0020	0.0031	<0.0020	0.00034	0.00039	0.001	0.00087	0.00063
Lead	mg/L	0.001-0.007 [2]	<0.0020	<0.0020	<0.0020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Lithium	mg/L	-	-	-	0.34	0.30	-	-	<2.0	
Manganese	mg/L	0.05	-	-	0.18	0.18	0.180	0.150	0.13	0.21
Mercury	mg/L	0.000005	<0.0000050	<0.0000050	<0.0000050	<0.0000020	<0.0000020	0.0000041	<0.0000020	<0.0000019
Molybdenum	mg/L	-	0.0021	0.0023	<0.0020	0.0016	0.0013	0.0016	0.0014	0.00047
Nickel	mg/L	0.007-0.170 [2]	0.0052	0.006	<0.0050	0.0035	0.0027	0.0029	0.0027	0.0012
Phosphorus	mg/L	-	-	-	<1.0	<0.10	<1	-	<10	
Selenium	mg/L	0.002	-	-	<0.0020	<0.00020	0.00025	<0.00020	<0.00020	<0.00020
Silicon	mg/L	-	-	-	4.3	4.3	4.3	-	<10	
Silver	mg/L	0.0001	-	-	<0.0010	<0.00010	<0.0001	<0.00010	<0.00010	<0.00010
Strontium	mg/L	-	-	-	2.4	2.1	2.4	-	<2.0	
Sulphur	mg/L	-	-	-	1300	1400	1400	-	1200	
Thallium	mg/L	-	-	-	<0.0020	<0.00020	<0.0002	-	<0.00020	
Tin	mg/L	-	-	-	<0.010	<0.0010	<0.001	-	<0.0010	
Titanium	mg/L	-	-	-	<0.010	0.0011	<0.001	-	<0.0010	
Uranium	mg/L	0.01	-	-	0.0022	0.0024	0.0022	0.0018	0.0022	0.00013
Vanadium	mg/L	-	-	-	<0.010	<0.0010	<0.001	<0.0030	<0.0010	
Zinc	mg/L	0.03	<0.030	<0.030	<0.030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030

Notes:

[1] Alberta Environment and Parks (AEP). 2019. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. 198 pp. Referenced guidelines are for fine textured soils under Agricultural land use

[2] Guideline varies with hardness

[3] Guideline varies with chloride

[4] Guideline varies with pH and temperature

[5] Guideline varies with pH

"-" No applicable guideline or not analyzed

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Table E8B: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 8B							
			Jun-13	May-14	May-15	Jun-16	Jun-17	Jun-18	Jun-19	Jun-20
Volatile Organic Compounds (VOCs)										
Bromodichloromethane	mg/L	-	-	-	-	-	-	-	<0.00050	
Bromoform	mg/L	-	-	-	-	-	-	-	<0.00050	
Bromomethane	mg/L	-	-	-	-	-	-	-	<0.0020	
Carbon tetrachloride	mg/L	0.002	-	-	-	-	-	-	<0.00050	<0.00050
Chlorobenzene	mg/L	0.0013	-	-	-	-	-	-	<0.00050	<0.00050
Chloroethane	mg/L	-	-	-	-	-	-	-	<0.0010	
Chloroform	mg/L	0.08	-	-	-	-	-	-	<0.00050	<0.00050
Chloromethane	mg/L	-	-	-	-	-	-	-	<0.0020	
Dibromochloromethane	mg/L	0.1	-	-	-	-	-	-	<0.0010	<0.0010
1,2-Dibromoethane	mg/L	-	-	-	-	-	-	-	<0.00020	
1,2-Dichlorobenzene	mg/L	0.0007	-	-	-	-	-	-	<0.00050	<0.00050
1,3-Dichlorobenzene	mg/L	-	-	-	-	-	-	-	<0.00050	
1,4-Dichlorobenzene	mg/L	0.001	-	-	-	-	-	-	<0.00050	<0.00050
1,1-Dichloroethane	mg/L	-	-	-	-	-	-	-	<0.00050	
1,2-Dichloroethane	mg/L	0.005	-	-	-	-	-	-	<0.00050	<0.00050
1,1-Dichloroethene	mg/L	0.014	-	-	-	-	-	-	<0.00050	<0.00050
1,2-Dichloroethene (cis)	mg/L	-	-	-	-	-	-	-	<0.00050	
1,2-Dichloroethene (trans)	mg/L	-	-	-	-	-	-	-	<0.00050	
1,2-Dichloropropane	mg/L	-	-	-	-	-	-	-	<0.00050	
1,3-Dichloropropene [cis]	mg/L	-	-	-	-	-	-	-	<0.00050	
1,3-Dichloropropene [trans]	mg/L	-	-	-	-	-	-	-	<0.00050	
Methyl t-Butyl Ether (MTBE)	mg/L	0.015	-	-	-	-	-	-	<0.00050	<0.00050
Methylene Chloride	mg/L	0.05	-	-	-	-	-	-	<0.0020	<0.0020
Methyl Methacrylate	mg/L	0.47	-	-	-	-	-	-	<0.00050	<0.00050
Styrene	mg/L	-	-	-	-	-	-	-	<0.00050	
1,1,1,2-Tetrachloroethane	mg/L	-	-	-	-	-	-	-	<0.0010	
1,1,2,2-Tetrachloroethane	mg/L	-	-	-	-	-	-	-	<0.0020	
Tetrachloroethene	mg/L	0.01	-	-	-	-	-	-	<0.00050	<0.00050
1,2,3-Trichlorobenzene	mg/L	0.008	-	-	-	-	-	-	<0.0010	<0.0010
1,2,4-Trichlorobenzene	mg/L	0.015	-	-	-	-	-	-	<0.0010	<0.0010
1,3,5-Trichlorobenzene	mg/L	0.014	-	-	-	-	-	-	<0.00050	<0.00050
1,1,1-Trichloroethane	mg/L	-	-	-	-	-	-	-	<0.00050	
1,1,2-Trichloroethane	mg/L	-	-	-	-	-	-	-	<0.00050	
Trichloroethene	mg/L	0.005	-	-	-	-	-	-	<0.00050	<0.00050
Trichlorofluoromethane	mg/L	-	-	-	-	-	-	-	<0.00050	
Trihalomethanes	mg/L	-	-	-	-	-	-	-	<0.0013	<0.0013
1,2,4-Trimethylbenzene	mg/L	-	-	-	-	-	-	-	<0.00050	
1,3,5-Trimethylbenzene	mg/L	-	-	-	-	-	-	-	<0.00050	
Vinyl chloride	mg/L	0.002	-	-	-	-	-	-	<0.00050	<0.00050

Notes:

[1] Alberta Environment and Parks (AEP). 2019. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. 198 pp. Referenced guidelines are for fine textured soils under Agricultural land use

[2] Guideline varies with hardness

[3] Guideline varies with chloride

[4] Guideline varies with pH and temperature

[5] Guideline varies with pH

"-" No applicable guideline or not analyzed

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

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	Jun-18	Jun-19	Jun-20
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	7.8	7.57	7.52
Field EC	mS	-	-	-	-	-	-	-	-	-	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	11.28	12.34	12.98
Field Temperature	°C	-	-	-	-	-	-	-	-	-	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	-	7.7	9.6	8.4	6.3
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	8.02	8.02	7.97
Conductivity (EC)	µS/cm	1000	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	10,000	13,000	13,000
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	130	170	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	74	100	110
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	2600	3100	3500
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	11	<30	11
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	<0.60	*<0.60*	0.16
Sulphate	mg/L	128-429 [2]	6020	6250	6580	7840	6360	6630	5970	5970	6350	6240	5690	5570	6010	5760	5700	5680	5470 *	5800	5900	6100	6700	5600	6300	5600	4900	6100	7000
Chloride	mg/L	100	<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	1.7	2.5	2.2
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	960	980	920
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	<1.0	<1.0	<1.0
Hydroxide	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.50	<0.50	<0.5	<1.0	<1.0	<1.0
Nitrate (N)	mg/L	3	<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	0.18	<0.20	0.1
Nitrite (N)	mg/L	0.02 - 0.20 [3]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.05	0.04	<0.16	0.054	*<0.20*	0.035
Nitrate and Nitrate (N)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.13	0.12	0.2	0.23	<0.28	0.14
Total Dissolved Solids (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	8200	9900	11000
Hardness	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	580	710	770	630	840	860
Alkalinity (total as CaCO3)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	730	720	780	790	800	750
Alkalinity (pp as CaCO3)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.50	<0.50	<0.5	-	<1.0	
Ionic Balance	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.96	0.89	2.1	3.9	2.8	2.9
Water Nutrients																													
Ammonia-N	mg/L	0.018-190 [4]	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	0.11	0.15	0.11
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	0.8	0.73	0.53
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	<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	<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	<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	<0.00089	<0.00089	<0.00089
F1 (C6-C10)	mg/L	2.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	1.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	<0.050	<0.25	<0.1	<0.10	<0.10	<0.10	<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	53	44	41
TOC	mg/L	-	16.1	15	14.8	14.9	15	15.3	16	17	14	16	16	15	15	16	-	-	-	-	-	-	-	-	-	-	-	-	
DOC	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14	13.8	14.8	14	15	14	15	16	17	16	17	18	15
Oil & Grease	mg/L	-	<5	<5	<5	<5	<5	<5	<1	<1	<1	<1	<1	<1	<1	<1	-	-	-	-	-	-	-	-	-	-	-	-	
Metals																													
Aluminum	mg/L	0.0007 / 0.05 [5]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.19	0.0087	<0.0030	<0.0030	0.022	<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	-	-	<0.0016 *	<0.01	<0.012	0.00074	<0.0060	<0.012	<0.00060	<0.00060	<0.00062	<0.00060	<0.00060
Arsenic	mg/L	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0040	0.00097	0.00078	0.00054	0.00070	0.00070
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	<0.10	<1.0	<0.010
Beryllium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.020	<0.0010	<0.001	-	<0.0010	
Boron	mg/L	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.44	0.42	0.46	0.44	0.47	0.37
Cadmium	mg/L	0.00004-0.00037 [2]	*<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	<0.000020	<0.000020	<0.000020
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	<0.0010	<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	<0.00030	0.00033	
Copper	mg/L	0.007	*<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	0.0019	0.0015	0.0013
Lead	mg/L	0.001-0.007 [2]	*<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	<0.00020	<0.00020	<0.00020
Lithium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.59	0.59	-	-	<2.0	
Manganese	mg/L	0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.087	0.055	<0.040	<0.040	0.044	0.017
Mercury	mg/L	0.000005	*<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	<0.0000020	<0.0000020	<0.0000019
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	0.00041	0.00037	
Nickel	mg/L	0.007-0.170 [2]	<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	0.0034	0.0031	0.0033
Phosphorus	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.10	<0.10	<1	-	<10	
Selenium	mg/L	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0040	0.00023	<0.00020	<0.00020	0.00026	0.00027
Silicon	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6.1	4.5	4.4	-	<10	
Silver	mg/L	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	<0.00010	<0.0001	<0.00010	<0.00010	<0.00010
Strontium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.7	3.0	3.7	-	3.9	
Sulphur	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1800	2100	2000	-	2300	
Thallium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0040	<0.00020	<0.0002	-	<0.00020	
Tin	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.020	<0.0010	<0.001	-	<0.0010	
Titanium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.020	<0.0010	<0.001	-	0.0029	
Uranium	mg/L	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	0.0021	0.0023	0.0013	0.0034	0.0043
Vanadium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.020	<0.0010	<0.001	-	<0.0010	
Zinc	mg/L	0.03	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	0.005	0.0075	0.0064

Notes:

[1] Alberta Environment and Parks (AEP), 2019. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. 198 pp. Referenced guidelines are for fine textured soils under Agricultural land use

[2] Guideline varies with hardness

[3] Guideline varies with chloride

[4] Guideline varies with pH and temperature

[5] Guideline varies with pH

"-" No applicable guideline or not analyzed

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Italic - Detection limit greater than Tier 1 Guideline

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	Jun-18	Jun-19	Jun-20
Polycyclic Aromatic Hydrocarbons (PAHs)																													
Benzo[a]pyrene equivalency	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.000010	-	-	-	-	-
Acenaphthene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acenaphthylene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acridine	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anthracene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benz(a)anthracene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a) pyrene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(b+j)fluoranthene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0000085	-	-	-	-	-
Benzo(c)phenanthrene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.000050	-	-	-	-	-
Benzo(e)pyrene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.000050	-	-	-	-	-
Benzo(g,h,i)perylene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0000085	-	-	-	-	-
Benzo(k)fluoranthene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0000085	-	-	-	-	-
Chrysene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0000085	-	-	-	-	-
Dibenz(a,h)anthracene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0000075	-	-	-	-	-
Fluoranthene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.000010	-	-	-	-	-
Fluorene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.000050	-	-	-	-	-
Indeno(1,2,3-c,d)pyrene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0000085	-	-	-	-	-
1-Methylnaphthalene	mg/L																												
2-Methylnaphthalene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00010	-	-	-	-	-
Naphthalene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00010	-	-	-	-	-
Perylene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.000050	-	-	-	-	-
Phenanthrene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.000050	-	-	-	-	-
Pyrene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.000020	-	-	-	-	-
Quinoline	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00020	-	-	-	-	-
Volatile Organic Compounds (VOCs)																													
Bromodichloromethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Bromoform	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Bromomethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	
Carbon tetrachloride	mg/L	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Chlorobenzene	mg/L	0.0013	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Chloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	
Chloroform	mg/L	0.08	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Chloromethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	
Dibromochloromethane	mg/L	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	<0.0010
1,2-Dibromoethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00020	
1,2-Dichlorobenzene	mg/L	0.0007	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,3-Dichlorobenzene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,4-Dichlorobenzene	mg/L	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,1-Dichloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,2-Dichloroethane	mg/L	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,1-Dichloroethene	mg/L	0.014	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,2-Dichloroethene (cis)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,2-Dichloroethene (trans)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,2-Dichloropropane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,3-Dichloropropene [cis]	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,3-Dichloropropene [trans]	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Methyl t-Butyl Ether (MTBE)	mg/L	0.015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Methylene Chloride	mg/L	0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	<0.0020
Methyl Methacrylate	mg/L	0.47	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Styrene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,1,1,2-Tetrachloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	
1,1,2,2-Tetrachloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	
Tetrachloroethene	mg/L	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,2,3-Trichlorobenzene	mg/L	0.008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	<0.0010
1,2,4-Trichlorobenzene	mg/L	0.015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	<0.0010
1,3,5-Trichlorobenzene	mg/L	0.014	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,1,1-Trichloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,1,2-Trichloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Trichloroethene	mg/L	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Trichlorofluoromethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Trihalomethanes	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0013	<0.0013
1,2,4-Trimethylbenzene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,3,5-Trimethylbenzene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Vinyl chloride	mg/L	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050

Notes:
[1] Alberta Environment and Parks (AEP). 2019. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. 198 pp. Referenced guidelines are for fine textured soils under Agricultural land use
[2] Guideline varies with hardness
[3] Guideline varies with chloride
[4] Guideline varies with pH and temperature
[5] Guideline varies with pH
"-" No applicable guideline or not analyzed
Equipment Failure, parameter not reported (EF)
Detection limit adjusted (*)
Exceeds Regulatory Limit
Italic - Detection limit greater than Tier 1 Guideline

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	Jun-18	Jun-19	Jun-20
Field Measurements												
Field pH	-	-	7.61	6.1	5.41	8.0	8.2	6.43	7.6	8	7.59	7.24
Field EC	mS	-	5.85	19.99	7.03	6.1	6.42	7.54	7.27	6.98	5.99	5.9
Field Temperature	°C	-	11.3	10	6.4	6.7	6.6	8.1	9.7	6.1	9.9	7.9
Routine Water												
pH	-	6.5 - 8.5	8.05	8.11	8.26	8.08	7.98	8.18	8.23	8.1	8.14	8.25
Conductivity (EC)	µS/cm	1000	5800	5800	5900	5900	6100	6100	6100	6100	6100	5900
Calcium	mg/L	-	150	130	130	130	140	140	150	140	140	140
Magnesium	mg/L	-	37	34	34	33	34	36	38	37	33	34
Sodium	mg/L	200	1300	1400	1300	1300	1400	1300	1400	1400	1300	1400
Potassium	mg/L	-	7.6	6.7	6.2	4.8	6.6	6.9	7.1	6.7	6.4	6.5
Iron	mg/L	0.3	<0.06	<0.060	0.095	<0.60	<0.060	<0.060	<0.6	<0.60	<0.060	0.07
Sulphate	mg/L	128-429 [2]	2700	2600	2800	3000	2900	2800	2600	2700	2500	2600
Chloride	mg/L	100	2	1.8	1.3	1.1	1.7	1.4	<1	<1.0	1.8	2.1
Bicarbonate	mg/L	-	740	760	760	770	750	710	760	760	760	700
Carbonate	mg/L	-	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.5	<1.0	<1.0	<1.0
Hydroxide	mg/L	-	-	-	-	-	<0.50	<0.50	<0.5	<1.0	<1.0	<1.0
Nitrate (N)	mg/L	3	0.009	0.0078	0.25	0.093	0.080	0.22	0.41	0.15	0.19	0.38
Nitrite (N)	mg/L	0.02 - 0.20 [3]	-	-	-	-	<0.010	0.018	0.28	<0.010	0.027	0.042
Nitrate and Nitrate (N)	mg/L	-	-	-	-	-	0.080	0.23	-	0.15	0.22	0.42
Total Dissolved Solids (TDS)	mg/L	500	4600	4600	4600	4800	4800	4700	4600	4700	4400	4500
Hardness	mg/L	-	-	-	-	-	490	510	530	510	480	480
Alkalinity (total as CaCO3)	mg/L	-	-	-	-	-	620	580	620	620	620	570
Alkalinity (pp as CaCO3)	mg/L	-	-	-	-	-	<0.50	<0.50	<0.5		<1.0	-
Ionic Balance	N/A	-	-	-	-	-	0.99	0.96	3.8	0.72	2.4	2.1
Water Nutrients												
Ammonia-N	mg/L	0.018-190 [4]	0.74	0.66	0.57	0.57	0.60	0.46	0.7	0.56	0.63	0.39
TKN	mg/L	-	1.6	1.3	1.2	1.2	1.2	0.58	1.1	1.1	0.94	0.91
Hydrocarbons												
Benzene	mg/L	0.005	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.0004	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.0004	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.0004	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	<0.0008	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.0008	<0.00089	<0.00089	<0.00089
F1 (C6-C10)	mg/L	2.2	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	1.1	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10
Organics												
COD	mg/L	-	78	56	46	39	42	51	28	30	48	36
TOC	mg/L	-	-	-	-	-	-	-	-	-	-	-
DOC	mg/L	-	11	10	12	9.6	11	11	10	11	12	9.9
Oil & Grease	mg/L	-	-	-	-	-	-	-	-	-	-	-
Metals												
Aluminum	mg/L	0.0007 / 0.05 [5]	-	-	-	-	<0.030	0.0079	0.0069	<0.0030	0.0056	0.012
Antimony	mg/L	0.006	<0.006	<0.0060	<0.0060	<0.0060	<0.0060	<0.00060	<0.0006	<0.00062	<0.00060	<0.00060
Arsenic	mg/L	0.005	-	-	-	-	<0.0020	0.0011	0.00068	0.00068	0.00077	0.0005
Barium	mg/L	1	0.06	0.037	0.035	<0.10	0.025	0.023	<0.1	<0.10	0.019	0.015
Beryllium	mg/L	-	-	-	-	-	<0.010	<0.0010	<0.001		<0.0010	-
Boron	mg/L	1	-	-	-	-	0.24	0.24	0.24	0.24	0.25	0.24
Cadmium	mg/L	0.00004-0.00037 [2]	0.00009	<0.050	0.000065	<0.000050	<0.00020	0.000036	<0.00002	<0.000020	<0.000020	<0.000020
Chromium	mg/L	0.05	<0.01	<0.010	<0.010	<0.010	<0.010	<0.0010	<0.001	<0.0010	<0.0010	<0.0010
Cobalt	mg/L	-	<0.003	<0.0030	<0.0030	<0.0030	<0.0030	0.00087	0.00067	0.00069	0.00067	-
Copper	mg/L	0.007	<0.002	<0.0020	<0.0020	<0.0020	<0.0020	0.00070	0.00039	0.00043	0.00080	0.0004
Lead	mg/L	0.001-0.007 [2]	<0.002	<0.0020	<0.0020	<0.0020	<0.0020	<0.00020	<0.0002	<0.00020	<0.00020	<0.00020
Lithium	mg/L	-	-	-	-	-	0.32	0.32	0.35		0.32	-
Manganese	mg/L	0.05	-	-	-	-	0.27	0.28	0.28	0.27	0.21	0.21
Mercury	mg/L	0.000005	<0.000005	<0.0020	<0.0000050	<0.0000050	<0.0000050	<0.0000020	<0.000002	<0.0000020	<0.0000020	<0.0000019
Molybdenum	mg/L	-	0.003	<0.0020	0.002	<0.0020	<0.0020	0.0013	0.00068	0.00082	0.00086	0.00047
Nickel	mg/L	0.007-0.170 [2]	<0.005	<0.0050	<0.0050	<0.0050	<0.0050	0.0021	0.0013	0.0016	0.0012	0.0012
Phosphorus	mg/L	-	-	-	-	-	0.10	<0.10	<1		<0.10	-
Selenium	mg/L	0.002	-	-	-	-	<0.0020	<0.00020	<0.0002	<0.00020	<0.00020	<0.00020
Silicon	mg/L	-	-	-	-	-	4.3	4.1	4.2		4.0	-
Silver	mg/L	0.0001	-	-	-	-	*<0.0010*	<0.00010	<0.0001	<0.00010	<0.00010	<0.00010
Strontium	mg/L	-	-	-	-	-	2.2	2.2	2.6		2.1	-
Sulphur	mg/L	-	-	-	-	-	920	950	960		960	-
Thallium	mg/L	-	-	-	-	-	<0.0020	<0.00020	<0.0002		<0.00020	-
Tin	mg/L	-	-	-	-	-	<0.010	<0.0010	<0.001		<0.0010	-
Titanium	mg/L	-	-	-	-	-	<0.010	<0.0010	<0.001		<0.0010	-
Uranium	mg/L	0.01	-	-	-	-	<0.0010	0.00036	0.00022	0.00018	0.00012	0.00013
Vanadium	mg/L	-	-	-	-	-	<0.010	<0.0010	<0.001	<0.0030	<0.0010	-
Zinc	mg/L	0.03	<0.03	<0.030	0.074	<0.030	<0.030	0.0037	<0.003	<0.0030	<0.0030	<0.0030

Notes:

[1] Alberta Environment and Parks (AEP). 2019. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. 198 pp. Referenced guidelines are for fine textured soils under Agricultural land use

[2] Guideline varies with hardness

[3] Guideline varies with chloride

[4] Guideline varies with pH and temperature

[5] Guideline varies with pH

"-" No applicable guideline or not analyzed

Detection limit adjusted (*)

Exceeds Regulatory Limit

Italic - Detection limit greater than Tier 1 Guideline

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	Jun-18	Jun-19	Jun-20
Volatile Organic Compounds (VOCs)												
Bromodichloromethane	mg/L	-	-	-	-	-	-	-	-	-	<0.00050	
Bromoform	mg/L	-	-	-	-	-	-	-	-	-	<0.00050	
Bromomethane	mg/L	-	-	-	-	-	-	-	-	-	<0.0020	
Carbon tetrachloride	mg/L	0.002	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Chlorobenzene	mg/L	0.0013	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Chloroethane	mg/L	-	-	-	-	-	-	-	-	-	<0.0010	
Chloroform	mg/L	0.08	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Chloromethane	mg/L	-	-	-	-	-	-	-	-	-	<0.0020	
Dibromochloromethane	mg/L	0.1	-	-	-	-	-	-	-	-	<0.0010	<0.0010
1,2-Dibromoethane	mg/L	-	-	-	-	-	-	-	-	-	<0.00020	
1,2-Dichlorobenzene	mg/L	0.0007	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,3-Dichlorobenzene	mg/L	-	-	-	-	-	-	-	-	-	<0.00050	
1,4-Dichlorobenzene	mg/L	0.001	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,1-Dichloroethane	mg/L	-	-	-	-	-	-	-	-	-	<0.00050	
1,2-Dichloroethane	mg/L	0.005	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,1-Dichloroethene	mg/L	0.014	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,2-Dichloroethene (cis)	mg/L	-	-	-	-	-	-	-	-	-	<0.00050	
1,2-Dichloroethene (trans)	mg/L	-	-	-	-	-	-	-	-	-	<0.00050	
1,2-Dichloropropane	mg/L	-	-	-	-	-	-	-	-	-	<0.00050	
1,3-Dichloropropene [cis]	mg/L	-	-	-	-	-	-	-	-	-	<0.00050	
1,3-Dichloropropene [trans]	mg/L	-	-	-	-	-	-	-	-	-	<0.00050	
Methyl t-Butyl Ether (MTBE)	mg/L	0.015	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Methylene Chloride	mg/L	0.05	-	-	-	-	-	-	-	-	<0.0020	<0.0020
Methyl Methacrylate	mg/L	0.47	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Styrene	mg/L	-	-	-	-	-	-	-	-	-	<0.00050	
1,1,1,2-Tetrachloroethane	mg/L	-	-	-	-	-	-	-	-	-	<0.0010	
1,1,2,2-Tetrachloroethane	mg/L	-	-	-	-	-	-	-	-	-	<0.0020	
Tetrachloroethene	mg/L	0.01	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,2,3-Trichlorobenzene	mg/L	0.008	-	-	-	-	-	-	-	-	<0.0010	<0.0010
1,2,4-Trichlorobenzene	mg/L	0.015	-	-	-	-	-	-	-	-	<0.0010	<0.0010
1,3,5-Trichlorobenzene	mg/L	0.014	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,1,1-Trichloroethane	mg/L	-	-	-	-	-	-	-	-	-	<0.00050	
1,1,2-Trichloroethane	mg/L	-	-	-	-	-	-	-	-	-	<0.00050	
Trichloroethene	mg/L	0.005	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Trichlorofluoromethane	mg/L	-	-	-	-	-	-	-	-	-	<0.00050	
Trihalomethanes	mg/L	-	-	-	-	-	-	-	-	-	<0.0013	<0.0013
1,2,4-Trimethylbenzene	mg/L	-	-	-	-	-	-	-	-	-	<0.00050	
1,3,5-Trimethylbenzene	mg/L	-	-	-	-	-	-	-	-	-	<0.00050	
Vinyl chloride	mg/L	0.002	-	-	-	-	-	-	-	-	<0.00050	<0.00050

Notes:
[1] Alberta Environment and Parks (AEP). 2019. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. 198 pp. Referenced guidelines are for fine textured soils under Agricultural land use
[2] Guideline varies with hardness
[3] Guideline varies with chloride
[4] Guideline varies with pH and temperature
[5] Guideline varies with pH
"-" No applicable guideline or not analyzed
Detection limit adjusted (*)
Exceeds Regulatory Limit
Italic - Detection limit greater than Tier 1 Guideline

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	Jun-18	Jun-19	May-20
Field Measurements																													
Field pH	-	-	-	8.27	-	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	7.7	7.38	7.67
Field EC	mS	-	-	-	-	-	-	-	-	-	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	4.53	4.24	2.95
Field Temperature	°C	-	-	-	-	-	-	-	-	-	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	8.5	11.2	5.5
Routine Water																													
pH	-	6.5 - 8.5	-	8.31	-	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	8.27	8.14	8.14
Conductivity (EC)	µS/cm	1000	-	2570	-	2640	2700	3090	3450	3330	3710	3370	3980	3910	4320	4300	4210	4440	4460	4600	4900	4600	4600	4700	4500	4100	4100	4300	4300
Calcium	mg/L	-	-	28.3	-	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	68	73	70
Magnesium	mg/L	-	-	14.9	-	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	32	24	26
Sodium	mg/L	200	-	593	-	687	659	678	798	732	836	887	906	888	1010	1000	969	971	929	990	1200	1100	990	910	840	870	910	940	960
Potassium	mg/L	-	-	3	-	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	4	4.2	3.7
Iron	mg/L	0.3	-	<0.02	-	<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	<0.06	<0.060	<0.060
Sulphate	mg/L	128-429 [2]	-	915	-	1080	1130	1160	1440	1250	1450	1560	1690	1560	1830	1850	1750	1950	1870	1900	2200	2200	2100	1900	1700	1600	1600	1600	1600
Chloride	mg/L	100	-	3.2	-	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	55	65	74
Bicarbonate	mg/L	-	-	640	-	539	467	614	571	578	579	581	579	559	591	595	613	599	579	590	600	580	600	590	620	630	650	660	660
Carbonate	mg/L	-	-	< 6	-	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	<1.0	<1.0	<1.0
Hydroxide	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.50	<0.50	<0.5	<1.0	<1.0	<1.0
Nitrate (N)	mg/L	3	-	1.04	-	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	0.1	0.057	0.11
Nitrite (N)	mg/L	0.02 - 0.20 [3]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.010	0.01	<0.16	<0.010	<0.010	<0.01
Nitrate and Nitrate (N)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.014	0.05	-	0.13	0.057	0.11
Total Dissolved Solids (TDS)	mg/L	500	-	1870	-	2100	2120	2200	2610	2340	2680	2840	3000	2850	3270	3280	3150	3350	3220	3300	3900	3700	3500	3400	3000	3000	3000	3000	3100
Hardness	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	520	280	310	300	280	280
Alkalinity (total as CaCO3)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	490	500	520	530	540	540
Alkalinity (pp as CaCO3)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.50	<0.50	<0.5	-	<1.0	
Ionic Balance	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.95	0.9	2	1.3	1.1	0.51
Water Nutrients																													
Ammonia-N	mg/L	0.018-190 [4]	-	<0.05	-	<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	0.06	0.30	0.17
TKN	mg/L	-	-	0.32	-	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	0.49	0.58	0.61
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	<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	<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	<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	<0.00089	<0.00089	<0.00089
F1 (C6-C10)	mg/L	2.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	1.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	<0.050	<0.25	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Organics																													
COD	mg/L	-	-	5	-	13	18	14	20	20	24	24	23	22	26	26	23	25.6	15.5	32	33	43	33	35	32	24	28	31	34
TOC	mg/L	-	-	6.9	-	7.8	6.7	6.6	7	7	8	8	9	9	9	9	-	-	-	-	-	-	-	-	-	-	-	-	
DOC	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8	8.3	9.2	11	10	11	9.6	11	9.7	8	8.6	17	9
Oil & Grease	mg/L	-	-	<5	-	7	-	<5	<1	2	<1	<1	<1	<1	<1	<1	-	-	-	-	-	-	-	-	-	-	-	-	
Metals																													
Aluminum	mg/L	0.0007 / 0.05 [5]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0030	0.0091	<0.0030	0.0068	<0.0030	<0.0030
Antimony	mg/L	0.006	-	<0.02	-	<0.001	-	<0.001	0.0209	0.0011	0.0007	<0.0004	0.0004	0.0008	<0.0004	0.0009	-	-	<0.00040	<0.0006	<0.0030	0.00073	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic	mg/L	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.00049	0.0006	0.00042	0.00059	0.00072	0.00061
Barium	mg/L	1	-	0.022	-	0.017	-	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	0.018	0.010	0.013
Beryllium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	<0.0010	<0.001	-	<0.0010	
Boron	mg/L	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.11	0.12	0.13	0.11	0.14	0.11
Cadmium	mg/L	0.00004-0.00037 [2]	-	*<0.003*	-	<0.00005	-	<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	<0.000020	<0.000020	<0.000020
Chromium	mg/L	0.05	-	0.0075	-	0.015	-	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	0.0059	<0.0010	0.0014
Cobalt	mg/L	-	-	0.0035	-	<0.0005	-	<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	<0.00030	0.00034	
Copper	mg/L	0.007	-	0.068	-	<0.005	-	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	0.002	0.0015	0.0014
Lead	mg/L	0.001-0.007 [2]	-	*<0.01*	-	<0.0005	-	<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	<0.00020	<0.00020	<0.00020
Lithium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.24	0.23	-	-	0.25	
Manganese	mg/L	0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.8	0.094	0.076	<0.004	0.088	0.28
Mercury	mg/L	0.000005	-	*<0.0001*	-	*<0.0001*	-	*<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	0.000005	<0.0000020	<0.0000019
Molybdenum	mg/L	-	-	<0.005	-	<0.005	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0050	<0.0050	0.0019	0.0012	0.0015	0.0022	0.0017	0.0038	0.0022	0.0025	0.0012	
Nickel	mg/L	0.007-0.170 [2]	-	0.007	-	<0.003	-	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	0.02	0.0095	0.011
Phosphorus	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.10	<0.10	<0.1	-	<0.10	
Selenium	mg/L	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0003	0.00052	0.00053	0.0006	<0.00020	0.00041
Silicon	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.9	4.7	4.8	-	4.1	
Silver	mg/L	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00010	<0.00010	<0.0001	<0.00010	<0.00010	<0.0001
Strontium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.4	0.92	1	-	0.88	
Sulphur	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	550	510	530	-	590	
Thallium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00020	<0.00020	<0.0002	-	<0.00020	
Tin	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	<0.0010	<0.001	-	<0.0010	
Titanium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	0.0010	<0.001	-	<0.0010	
Uranium	mg/L	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0048	0.0093	0.0086	0.0099	0.0027	0.0054
Vanadium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	<0.0010	<0.001	-	<0.0010	
Zinc	mg/L	0.03	-	0.184	-	0.007	-	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	<0.0030	0.0031	<0.0030

Notes:

[1] Alberta Environment and Parks (AEP). 2019. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. 198 pp. Referenced guidelines are for fine textured soils under Agricultural land use

[2] Guideline varies with hardness

[3] Guideline varies with chloride

[4] Guideline varies with pH and temperature

[5] Guideline varies with pH

"-" No applicable guideline or not analyzed

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Italic - Detection limit greater than Tier 1 Guideline

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	Jun-18	Jun-19	May-20
Volatile Organic Compounds (VOCs)																													
Bromodichloromethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Bromoform	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Bromomethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	
Carbon tetrachloride	mg/L	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Chlorobenzene	mg/L	0.0013	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Chloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	
Chloroform	mg/L	0.08	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Chloromethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	
Dibromochloromethane	mg/L	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	<0.0010
1,2-Dibromoethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00020	
1,2-Dichlorobenzene	mg/L	0.0007	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,3-Dichlorobenzene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,4-Dichlorobenzene	mg/L	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,1-Dichloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,2-Dichloroethane	mg/L	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,1-Dichloroethene	mg/L	0.014	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,2-Dichloroethene (cis)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,2-Dichloroethene (trans)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,2-Dichloropropane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,3-Dichloropropene [cis]	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,3-Dichloropropene [trans]	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Methyl t-Butyl Ether (MTBE)	mg/L	0.015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Methylene Chloride	mg/L	0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	<0.0020
Methyl Methacrylate	mg/L	0.47	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Styrene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,1,1,2-Tetrachloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	
1,1,2,2-Tetrachloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	
Tetrachloroethene	mg/L	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,2,3-Trichlorobenzene	mg/L	0.008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	<0.0010
1,2,4-Trichlorobenzene	mg/L	0.015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	<0.0010
1,3,5-Trichlorobenzene	mg/L	0.014	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,1,1-Trichloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,1,2-Trichloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Trichloroethene	mg/L	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Trichlorofluoromethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Trihalomethanes	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0013	<0.0013
1,2,4-Trimethylbenzene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,3,5-Trimethylbenzene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Vinyl chloride	mg/L	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050

Notes:

[1] Alberta Environment and Parks (AEP). 2019. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. 198 pp. Referenced guidelines are for fine textured soils under Agricultural land use

[2] Guideline varies with hardness

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Table E11: Field Data and Chemical Analysis Results

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			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	Jun-18	Jun-19	May-20
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	7.5	7.28	7.18
Field EC	mS	-	-	-	-	-	-	-	-	-	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	10.35	8.86	9.26
Field Temperature	°C	-	-	-	-	-	-	-	-	-	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	7.9	9.6	9.3
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	8.01	7.99	8.05
Conductivity (EC)	µS/cm	1000	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	9800	8500	9400
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	240	190	230
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	130	92	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	2300	2000	2300
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	8.7	<30	8.4
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	<0.60	*<0.60*	*<0.60*
Sulphate	mg/L	128-429 [2]	3140	4390	3660	4720	3280	4720	4280	4380	3950	5550	4750	5710	4450	5190	4440	5020	4170	5300	5600	5400	5600	5100	4800	4500	4600	3700	3800
Chloride	mg/L	100	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	36	31	53
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	1000	910	960
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	<1.0	<1.0	<1.0
Hydroxide	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.50	<0.50	<0.5	<1.0	<1.0	<1.0
Nitrate (N)	mg/L	3	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	0.33	0.26	0.074
Nitrite (N)	mg/L	0.02 - 0.20 [3]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.010	0.015	<0.16	<0.01	<0.10	<0.050
Nitrate and Nitrate (N)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.19	0.25	-	0.33	0.26	0.075
Total Dissolved Solids (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	7800	6500	7000
Hardness	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	980	1100	980	1100	860	1100
Alkalinity (total as CaCO3)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	740	770	850	830	750	780
Alkalinity (pp as CaCO3)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.50	<0.50	<0.5	-	<1.0	
Ionic Balance	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.96	0.97	0.26	3.8	6.5	11
Water Nutrients																													
Ammonia-N	mg/L	0.018-190 [4]	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	0.063	0.11	0.22
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	1.7	1.2	1.1
Hydrocarbons																		2.31											
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	<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	<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	<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	<0.00089	<0.00089	<0.00089
F1 (C6-C10)	mg/L	2.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	1.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	<0.050	<0.25	<0.1	<0.10	<0.10	<0.10	<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	98	86	91
TOC	mg/L	-	34.5	45	36.6	39.8	25.9	40.4	38	39	40	45	42	48	33	39	-	-	-	-	-	-	-	-	-	-	-	-	
DOC	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	34	36.4	34.7	36	36	33	29	34	36	31	36	32	27
Oil & Grease	mg/L	-	<5	<5	<5	<5	<5	<5	<1	<1	<1	<1	<1	<1	<1	<1	-	-	-	-	-	-	-	-	-	-	-	-	
Metals																													
Aluminum	mg/L	0.0007 / 0.05 [5]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.030	0.0060	<0.0030	0.0055	0.012	<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	-	-	0.00061	<0.006	<0.0060	0.001	<0.0060	<0.0060	<0.00060	<0.00060	<0.00077	<0.00060	<0.00060
Arsenic	mg/L	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	0.0011	0.0011	0.0011	0.00085	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	<0.10	<1.0	<0.010
Beryllium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.010	<0.0010	<0.001	-	<0.0010	
Boron	mg/L	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.19	0.20	<0.20	0.21	0.25	0.2
Cadmium	mg/L	0.00004-0.00037 [2]	*<0.005*	*<0.003*	*<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	<0.0010	<0.000050	<0.000050	0.000055	0.000084	<0.000050	<0.00020	0.000024	0.000029	<0.000020	<0.000020	<0.000020
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	0.0011	<0.0010	<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	<0.00030	<0.00030	
Copper	mg/L	0.007	*<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	0.0026	0.0023	0.002
Lead	mg/L	0.001-0.007 [2]	*<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	<0.00020	<0.00020	<0.00020
Lithium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.54	0.55	-	-	<2.0	
Manganese	mg/L	0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.015	0.0081	<0.040	<0.040	<0.040	0.015
Mercury	mg/L	0.000005	*< .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	<0.0000020	<0.0000020	<0.0000019
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	0.0011	0.00099	
Nickel	mg/L	0.007-0.170 [2]	<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	0.0056	0.0042	0.005
Phosphorus	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.10	<0.10	<1	-	<10	
Selenium	mg/L	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	0.0011	0.00079	0.00095	0.00044	0.00027
Silicon	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.8	4.9	4.8	-	<10	
Silver	mg/L	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*<0.0010*	<0.00010	<0.0001	<0.00010	<0.00010	<0.00010
Strontium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3.7	4.0	3.8	-	3.4	
Sulphur	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1700	1700	1500	-	1500	
Thallium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	<0.00020	<0.0002	-	<0.00020	
Tin	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.010	<0.0010	<0.001	-	<0.0010	
Titanium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.010	<0.0010	<0.001	-	<0.0010	
Uranium	mg/L	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.024	0.030	0.030	0.030	0.020	0.031
Vanadium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.010	<0.0010	<0.001	-	<0.0010	
Zinc	mg/L	0.03	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	<0.0030	0.0046	0.0034

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Volatile Organic Compounds (VOCs)																													
Bromodichloromethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Bromoform	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Bromomethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	
Carbon tetrachloride	mg/L	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Chlorobenzene	mg/L	0.0013	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Chloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	
Chloroform	mg/L	0.08	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Chloromethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	
Dibromochloromethane	mg/L	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	<0.0010
1,2-Dibromoethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00020	
1,2-Dichlorobenzene	mg/L	0.0007	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,3-Dichlorobenzene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,4-Dichlorobenzene	mg/L	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,1-Dichloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,2-Dichloroethane	mg/L	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,1-Dichloroethene	mg/L	0.014	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,2-Dichloroethene (cis)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,2-Dichloroethene (trans)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,2-Dichloropropane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,3-Dichloropropene [cis]	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,3-Dichloropropene [trans]	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Methyl t-Butyl Ether (MTBE)	mg/L	0.015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Methylene Chloride	mg/L	0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	<0.0020
Methyl Methacrylate	mg/L	0.47	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Styrene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,1,1,2-Tetrachloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	
1,1,2,2-Tetrachloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	
Tetrachloroethene	mg/L	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,2,3-Trichlorobenzene	mg/L	0.008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	<0.0010
1,2,4-Trichlorobenzene	mg/L	0.015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	<0.0010
1,3,5-Trichlorobenzene	mg/L	0.014	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,1,1-Trichloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,1,2-Trichloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Trichloroethene	mg/L	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Trichlorofluoromethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Trihalomethanes	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0013	<0.0013
1,2,4-Trimethylbenzene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,3,5-Trimethylbenzene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Vinyl chloride	mg/L	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050

Notes:
[1] Alberta Environment and Parks (AEP). 2019. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. 198 pp. Referenced guidelines are for fine textured soils under Agricultural land use
[2] Guideline varies with hardness
[3] Guideline varies with chloride
[4] Guideline varies with pH and temperature
[5] Guideline varies with pH
"-" No applicable guideline or not analyzed
Equipment Failure, parameter not reported (EF)
Detection limit adjusted (*)
Exceeds Regulatory Limit
Italic - Detection limit greater than Tier 1 Guideline

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	Jun-18	Jun-19	Jun-20
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	8.2	7.32	7.36
Field EC	mS	-	-	-	-	-	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	11.72	12.41	10.71
Field Temperature	°C	-	-	-	-	-	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	-	6.3	5.8	8.3	5.6
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	8.01	7.96	7.93
Conductivity (EC)	µS/cm	1000	7820	8280	8090	7800	7650	7860	7760	7760	7850	7920	7720	7740	11200	11000	9700	10000	11,000	11,000	11,000	11,000	11,000	13,000	11,000
Calcium	mg/L	-	138	139	142	99.4	129	118	113	114	123	120	123	103	248 *	250	160	210	380	260	270	280	230	360	240
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	47	69	59
Sodium	mg/L	200	1920	1990	2040	2040	2010	2020	1970	1990	2030	2080	1980	1850	2970 *	2600	2500	2400	3400	2800	2500	2600	2500	2900	2700
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	9.3	<30	8.5
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	<0.6	*<0.60*	0.081
Sulphate	mg/L	128-429 [2]	4410	4390	4290	4030	3650	4020	3920	3720	3760	3850	3760	3730	5710 *	6100	5300	5600	6800	6100	5600	5300	4900	6100	5100
Chloride	mg/L	100	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	4.7	7.9	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	820	970	810
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	<1.0	<1.0	<1.0
Hydroxide	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.50	<0.50	<0.5	<1.0	<1.0	<1.0
Nitrate (N)	mg/L	3	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	0.64	0.71	0.19
Nitrite (N)	mg/L	0.02 - 0.20 [3]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.038	0.053	<0.16	0.012	*<0.20*	*0.028*
Nitrate and Nitrate (N)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.16	0.25	<0.05	0.65	0.71	0.22
Total Dissolved Solids (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	8200	10,000	8,500
Hardness	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	890	900	950	780	1200	830
Alkalinity (total as CaCO3)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	700	670	710	670	800	660
Alkalinity (pp as CaCO3)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.50	<0.50	<0.5	-	<1.0	
Ionic Balance	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.98	0.99	3.2	4.5	2.5	5.7
Water Nutrients																									
Ammonia-N	mg/L	0.018-190 [4]	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	1.1	2.3	1.8
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	2.1	3.3	1.9
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	<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	<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	<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	<0.00089	<0.00089	<0.00089
F1 (C6-C10)	mg/L	2.2	-	-	-	-	-	-	-	-	-	-	<0.1	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	1.1	-	-	-	-	-	-	-	-	-	-	<0.05	<0.050	<0.25	<0.1	<0.10	<0.10	<0.10	<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	53	80	52
TOC	mg/L	-	7.2	8.8	8	7	7	7	7	6	8	8	-	-	-	-	-	-	-	-	-	-	-	-	
DOC	mg/L	-	-	-	-	-	-	-	-	-	-	-	7	6.5	25.4	26	14	20	21	22	24	21	19	35	21
Oil & Grease	mg/L	-	6	<5	<1	<1	<1	<1	<1	<1	<1	<1	-	-	-	-	-	-	-	-	-	-	-	-	
Metals																									
Aluminum	mg/L	0.0007 / 0.05 [5]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*<0.060*	<0.0030	0.0037	<0.003	<0.0030	<0.0030
Antimony	mg/L	0.006	<0.002	<0.002	0.0094	0.0009	0.0007	<0.0004	0.0006	0.0007	-	0.0007	-	-	<0.0016 *	<0.01	<0.0060	0.00084	<0.0060	<0.012	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic	mg/L	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0040	0.00088	0.00067	0.00066	0.00086	0.00075
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	<0.10	<1.0	<0.010
Beryllium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.020	<0.0010	<0.001	-	<0.0010	
Boron	mg/L	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.56	0.57	0.55	0.59	0.60	0.45
Cadmium	mg/L	0.00004-0.00037 [2]	<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	<0.00002	<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	<0.005	<0.005	<0.005	<0.0050	<0.0050 *	<0.02	<0.010	<0.020	<0.010	<0.020	<0.0010	<0.0010	<0.0010	<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	0.00033	0.00043	
Copper	mg/L	0.007	*<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	0.0027	0.0041	0.0018
Lead	mg/L	0.001-0.007 [2]	<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	<0.00020	<0.00020	<0.00020
Lithium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.59	0.56	-	-	<2.0	
Manganese	mg/L	0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.43	0.36	0.42	0.3	0.39	0.31
Mercury	mg/L	0.000005	*<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	<0.000002	<0.0000020	<0.0000019
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	0.00081	0.00078	
Nickel	mg/L	0.007-0.170 [2]	<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	0.0022	0.0032	0.0012
Phosphorus	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<1.0	<0.10	<1	-	<10	
Selenium	mg/L	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0040	0.00029	<0.00020	0.00022	0.00037	0.00024
Silicon	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.7	4.5	4.7	-	<10	
Silver	mg/L	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*<0.0020*	<0.00010	<0.0001	<0.00010	<0.00010	<0.00010
Strontium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.8	5.2	5.5	-	7.2	
Sulphur	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1900	2000	1900	-	2300	
Thallium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0040	<0.00020	<0.0002	-	<0.00020	
Tin	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.020	<0.0010	<0.001	-	<0.0010	
Titanium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.020	<0.0010	<0.001	-	<0.0010	
Uranium	mg/L	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.019	0.021	0.025	0.018	0.048	0.05
Vanadium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.020	<0.0010	<0.001	-	<0.0010	
Zinc	mg/L	0.03	<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	<0.0030	0.0033	<0.0030

Notes:

[1] Alberta Environment and Parks (AEP). 2019. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. 198 pp. Referenced guidelines are for fine textured soils under Agricultural land use

[2] Guideline varies with hardness

[3] Guideline varies with chloride

[4] Guideline varies with pH and temperature

[5] Guideline varies with pH

"-" No applicable guideline or not analyzed

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Italic - Detection limit greater than Tier 1 Guideline

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	Jun-18	Jun-19	Jun-20
Volatile Organic Compounds (VOCs)																									
Bromodichloromethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Bromoform	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Bromomethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	
Carbon tetrachloride	mg/L	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Chlorobenzene	mg/L	0.0013	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Chloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	
Chloroform	mg/L	0.08	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Chloromethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	
Dibromochloromethane	mg/L	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	<0.0010
1,2-Dibromoethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00020	
1,2-Dichlorobenzene	mg/L	0.0007	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,3-Dichlorobenzene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,4-Dichlorobenzene	mg/L	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,1-Dichloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,2-Dichloroethane	mg/L	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,1-Dichloroethene	mg/L	0.014	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,2-Dichloroethene (cis)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,2-Dichloroethene (trans)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,2-Dichloropropane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,3-Dichloropropene [cis]	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,3-Dichloropropene [trans]	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Methyl t-Butyl Ether (MTBE)	mg/L	0.015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Methylene Chloride	mg/L	0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	<0.0020
Methyl Methacrylate	mg/L	0.47	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Styrene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,1,1,2-Tetrachloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	
1,1,2,2-Tetrachloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	
Tetrachloroethene	mg/L	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,2,3-Trichlorobenzene	mg/L	0.008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	<0.0010
1,2,4-Trichlorobenzene	mg/L	0.015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	<0.0010
1,3,5-Trichlorobenzene	mg/L	0.014	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,1,1-Trichloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,1,2-Trichloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Trichloroethene	mg/L	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Trichlorofluoromethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Trihalomethanes	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0013	<0.0013
1,2,4-Trimethylbenzene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,3,5-Trimethylbenzene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Vinyl chloride	mg/L	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050

Notes:
[1] Alberta Environment and Parks (AEP). 2019. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. 198 pp. Referenced guidelines are for fine textured soils under Agricultural land use
[2] Guideline varies with hardness
[3] Guideline varies with chloride
[4] Guideline varies with pH and temperature
[5] Guideline varies with pH
"-" No applicable guideline or not analyzed
Equipment Failure, parameter not reported (EF)
Detection limit adjusted (*)
Exceeds Regulatory Limit
Italic - Detection limit greater than Tier 1 Guideline

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	Jun-18	Jun-19	Jun-20
Field Measurements															
Field pH	-	-	8.5	8.377	8.21	8.34	8.31	6.09	8.4	8.8	6.75	8.5	8.2	8.53	8.53
Field EC	mS	-	1.386	1.500	13.4	1.56	1.614	1.80	15.82	1.64	1.916	1.517	1719	1.592	1.547
Field Temperature	°C	-	6.6	8.0	14.1	10.9	7.6	6.79	6.4	6.6	8.3	8.7	6.1	9.4	6.3
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	8.45	8.49	8.4
Conductivity (EC)	µS/cm	1000	1470	1500	1490	1500	1500	1,500	1500	1500	1500	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	2.8	2.9	3
Magnesium	mg/L	-	0.9	0.52	0.58	0.4	0.39	0.36	<2.0	0.30	0.34	0.31	0.3	0.25	0.37
Sodium	mg/L	200	375	380	389	400	380	360	390	360	380	380	380	360	390
Potassium	mg/L	-	1.2	1.45	1.46	1.5	1.4	1.3	<3.0	1.3	1.5	1.4	1.4	1.4	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	<0.06	<0.060	<0.060
Sulphate	mg/L	128-429 [2]	5.7	1.42	<0.50	2	<1.0	2.0	2.4	1.4	6.9	2.1	<1.0	1.6	<1.0
Chloride	mg/L	100	8	6.18	5.75	7	6.7	6.2	7.3	7.2	7.4	7.3	7.5	7.3	7.6
Bicarbonate	mg/L	-	1010	1000	991	960	960	980	970	1000	950	1000	1000	990	930
Carbonate	mg/L	-	29	28.1	18.9	17	26	30	38	8.9	9.5	17	14	19	9.6
Hydroxide	mg/L	-	-	-	-	-	-	-	-	<0.50	<0.50	<0.5	<1.0	<1.0	<1.0
Nitrate (N)	mg/L	3	<0.1	<0.050	<0.050	0.12	<0.0030	<0.003	<0.010	<0.010	0.011	<0.044	<0.020	<0.010	<0.010
Nitrite (N)	mg/L	0.02 - 0.20 [3]	-	-	-	-	-	-	-	<0.010	<0.010	<0.033	<0.010	<0.010	<0.010
Nitrate and Nitrate (N)	mg/L	-	-	-	-	-	-	-	-	<0.010	<0.020	-	<0.020	<0.014	<0.014
Total Dissolved Solids (TDS)	mg/L	500	922	914	908	910	900	890	920	880	870	910	910	880	870
Hardness	mg/L	-	-	-	-	-	-	-	-	8.1	8.9	8.4	8.3	8.3	8.9
Alkalinity (total as CaCO3)	mg/L	-	-	-	-	-	-	-	-	840	800	850	850	840	780
Alkalinity (pp as CaCO3)	mg/L	-	-	-	-	-	-	-	-	7.4	7.9	15	-	16	
Ionic Balance	N/A	-	-	-	-	-	-	-	-	0.95	1.0	0.86	1.1	3.1	4.2
Water Nutrients															
Ammonia-N	mg/L	0.018-190 [4]	0.54	0.598	0.231	0.64	0.64	0.62	0.62	0.64	0.66	0.72	0.59	0.60	0.63
TKN	mg/L	-	0.9	1.13	1.28	1.1	1	1.1	1.1	0.98	0.90	0.94	0.92	0.92	1
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	<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	<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	<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	<0.00089	<0.00089	<0.00089
F1 (C6-C10)	mg/L	2.2	<0.1	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	1.1	<0.05	<0.050	<0.25	<0.1	<0.10	<0.10	<0.10	<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	35	37	26
TOC	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	
DOC	mg/L	-	8	6.7	8.5	7.9	7.2	6.5	5.2	6.9	6.9	7.2	7.4	9.7	6.6
Oil & Grease	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	
Metals															
Aluminum	mg/L	0.0007 / 0.05 [5]	-	-	-	-	-	-	-	0.0046	0.029	0.0045	0.0074	<0.0030	<0.0030
Antimony	mg/L	0.006	-	-	0.0004	<0.006	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic	mg/L	0.005	-	-	-	-	-	-	-	0.0010	0.00092	0.001	0.0013	0.0010	0.0013
Barium	mg/L	1	0.124	0.0834	0.117	0.1	0.095	0.098	<0.10	0.089	0.091	0.1	0.1	0.10	0.08
Beryllium	mg/L	-	-	-	-	-	-	-	-	<0.0010	<0.0010	<0.001	-	<0.0010	
Boron	mg/L	1	-	-	-	-	-	-	-	0.78	0.81	0.83	0.83	0.85	0.81
Cadmium	mg/L	0.00004-0.00037 [2]	*<0.001*	*<0.0010*	0.00007	<0.00005	0.000024	<0.000025	<0.000025	<0.000020	<0.000020	<0.000020	<0.00002	<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	<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	<0.00030	<0.00030	
Copper	mg/L	0.007	<0.001	0.0015	0.0032	<0.002	0.00059	0.00039	0.00057	0.00025	0.00023	0.00038	<0.00020	0.00066	0.0039
Lead	mg/L	0.001-0.007 [2]	<0.005	<0.0050	0.00013	<0.002	<0.00020	<0.00020	0.00033	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Lithium	mg/L	-	-	-	-	-	-	-	-	0.066	0.073	-	-	0.073	
Manganese	mg/L	0.05	-	-	-	-	-	-	-	0.045	0.059	0.04	0.049	0.034	0.049
Mercury	mg/L	0.000005	-	*<0.00010*	*<0.00010*	<0.000005	*<0.002*	<0.0000050	<0.0000050	<0.0000050	<0.0000020	<0.0000020	<0.000002	<0.0000020	<0.0000019
Molybdenum	mg/L	-	0.026	0.0058	0.0088	0.004	0.0046	0.0047	0.0048	0.0043	0.0043	0.0043	0.0063	0.0041	
Nickel	mg/L	0.007-0.170 [2]	0.003	0.01	0.0121	0.006	0.0043	0.0036	0.0044	0.0039	0.0035	0.0024	0.0025	0.0021	0.0022
Phosphorus	mg/L	-	-	-	-	-	-	-	-	0.21	0.10	0.11	-	<0.10	
Selenium	mg/L	0.002	-	-	-	-	-	-	-	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Silicon	mg/L	-	-	-	-	-	-	-	-	3.2	3.5	3.5	-	3.4	
Silver	mg/L	0.0001	-	-	-	-	-	-	-	<0.00010	<0.00010	<0.0001	<0.00010	<0.00010	<0.00010
Strontium	mg/L	-	-	-	-	-	-	-	-	0.064	0.066	0.068	-	0.063	
Sulphur	mg/L	-	-	-	-	-	-	-	-	0.22	0.22	0.32	-	0.2	
Thallium	mg/L	-	-	-	-	-	-	-	-	<0.00020	<0.00020	<0.0002	-	<0.00020	
Tin	mg/L	-	-	-	-	-	-	-	-	<0.0010	<0.0010	<0.001	-	<0.0010	
Titanium	mg/L	-	-	-	-	-	-	-	-	<0.0010	0.0013	<0.001	-	<0.0010	
Uranium	mg/L	0.01	-	-	-	-	-	-	-	0.00026	0.00013	0.00026	0.00029	0.0003	0.0001
Vanadium	mg/L	-	-	-	-	-	-	-	-	<0.0010	<0.0010	<0.001	-	<0.0010	
Zinc	mg/L	0.03	0.003	0.0111	0.0079	<0.03	0.0038	<0.0030	0.0033	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030

Notes:

[1] Alberta Environment and Parks (AEP). 2019. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. 198 pp. Referenced guidelines are for fine textured soils under Agricultural land use

[2] Guideline varies with hardness

[3] Guideline varies with chloride

[4] Guideline varies with pH and temperature

[5] Guideline varies with pH

"-" No applicable guideline or not analyzed

Detection limit adjusted (*)

Exceeds Regulatory Limit

Italic - Detection limit greater than Tier 1 Guideline

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	Jun-18	Jun-19	Jun-20
Volatile Organic Compounds (VOCs)															
Bromodichloromethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Bromoform	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Bromomethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	
Carbon tetrachloride	mg/L	0.002	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Chlorobenzene	mg/L	0.0013	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Chloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	
Chloroform	mg/L	0.08	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Chloromethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	
Dibromochloromethane	mg/L	0.1	-	-	-	-	-	-	-	-	-	-	-	<0.0010	<0.0010
1,2-Dibromoethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	<0.00020	
1,2-Dichlorobenzene	mg/L	0.0007	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,3-Dichlorobenzene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,4-Dichlorobenzene	mg/L	0.001	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,1-Dichloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,2-Dichloroethane	mg/L	0.005	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,1-Dichloroethene	mg/L	0.014	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,2-Dichloroethene (cis)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,2-Dichloroethene (trans)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,2-Dichloropropane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,3-Dichloropropene [cis]	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,3-Dichloropropene [trans]	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Methyl t-Butyl Ether (MTBE)	mg/L	0.015	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Methylene Chloride	mg/L	0.05	-	-	-	-	-	-	-	-	-	-	-	<0.0020	<0.0020
Methyl Methacrylate	mg/L	0.47	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Styrene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,1,1,2-Tetrachloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	
1,1,2,2-Tetrachloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	
Tetrachloroethene	mg/L	0.01	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,2,3-Trichlorobenzene	mg/L	0.008	-	-	-	-	-	-	-	-	-	-	-	<0.0010	<0.0010
1,2,4-Trichlorobenzene	mg/L	0.015	-	-	-	-	-	-	-	-	-	-	-	<0.0010	<0.0010
1,3,5-Trichlorobenzene	mg/L	0.014	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,1,1-Trichloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,1,2-Trichloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Trichloroethene	mg/L	0.005	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Trichlorofluoromethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Trihalomethanes	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	<0.0013	<0.0013
1,2,4-Trimethylbenzene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,3,5-Trimethylbenzene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Vinyl chloride	mg/L	0.002	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050

Notes:

[1] Alberta Environment and Parks (AEP). 2019. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. 198 pp. Referenced guidelines are for fine textured soils under Agricultural land use

[2] Guideline varies with hardness

[3] Guideline varies with chloride

[4] Guideline varies with pH and temperature

[5] Guideline varies with pH

"-" No applicable guideline or not analyzed

Detection limit adjusted (*)

Exceeds Regulatory Limit

Italic - Detection limit greater than Tier 1 Guideline

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	Jun-18	Jun-19	Jun-20
Field Measurements															
Field pH	-	-	7.302	7.263	7.21	7.34	7.06	6.04	7.6	8.0	6.00	7.4	7.4	7.25	7.06
Field EC	mS	-	6.08	6.04	1.05	6.33	3.10	4.92	2.92	3.80	4.24	3.16	3.5	2.84	2.95
Field Temperature	°C	-	5.7	6.9	7	7	7.2	11.6	8.9	5.9	8.3	8	8.7	11.2	8.7
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	7.89	7.96	7.68
Conductivity (EC)	µS/cm	1000	6020	6270	6460	6200	6900	4200	2900	3600	3400	3000	3300	2800	2900
Calcium	mg/L	-	511	524	519	450	540	230	120	190	180	180	210	180	200
Magnesium	mg/L	-	134	116	135	120	150	57	33	47	45	48	55	42	54
Sodium	mg/L	200	1110	1250	1020	1100	1300	690	510	670	570	530	560	420	460
Potassium	mg/L	-	3.6	8.42	7.08	7.4	8.4	4.9	3.7	4.6	4.5	4.4	4.7	4.1	4.2
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	<0.06	<0.060	<0.060
Sulphate	mg/L	128-429 [2]	3230	3380	3420 *	3300	3700	2200	1400	1700	1500	1100	1100	910	720
Chloride	mg/L	100	22	19.5	<10 *	48	3.5	17	14	17	22	29	44	53	130
Bicarbonate	mg/L	-	846	838	880	780	980	400	350	410	390	760	800	650	910
Carbonate	mg/L	-	<5	<5.0	<5.0	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<1.0	<1.0	<1.0
Hydroxide	mg/L	-	-	-	-	-	-	-	-	<0.50	<0.50	<0.5	<1.0	<1.0	<1.0
Nitrate (N)	mg/L	3	<0.1	<0.050	<1.0 *	0.23	0.016	0.2	0.2	0.13	0.089	0.36	0.17	0.13	0.15
Nitrite (N)	mg/L	0.02 - 0.20 [3]	-	-	-	-	-	-	-	0.011	0.015	0.037	<0.010	<0.010	<0.010
Nitrate and Nitrate (N)	mg/L	-	-	-	-	-	-	-	-	0.14	0.10	-	0.17	0.13	0.15
Total Dissolved Solids (TDS)	mg/L	500	5430	5710	5530	5400	6200	3400	2300	2800	2600	2200	2400	1900	2000
Hardness	mg/L	-	-	-	-	-	-	-	-	670	630	660	740	620	720
Alkalinity (total as CaCO3)	mg/L	-	-	-	-	-	-	-	-	330	320	620	650	530	750
Alkalinity (pp as CaCO3)	mg/L	-	-	-	-	-	-	-	-	<0.50	<0.50	<0.5	-	<1.0	
Ionic Balance	N/A	-	-	-	-	-	-	-	-	1.0	0.96	1.8	1.9	0.32	1.2
Water Nutrients															
Ammonia-N	mg/L	0.018-190 [4]	0.16	0.507	0.052	0.63	0.48	0.23	0.09	0.14	0.10	0.17	0.072	0.25	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	1.1	0.74	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	<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	<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	<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	<0.00089	<0.00089	<0.00089
F1 (C6-C10)	mg/L	2.2	<0.1	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	1.1	<0.05	<0.050	<0.25	<0.1	<0.10	<0.10	<0.10	<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	49	29	36
TOC	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	
DOC	mg/L	-	11	11.3	9.3	11	8.9	9.3	7.3	9.2	8.2	11	12	9.9	15
Oil & Grease	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	
Metals															
Aluminum	mg/L	0.0007 / 0.05 [5]	-	-	-	-	-	-	-	0.0034	0.11	0.0062	0.004	<0.0030	<0.0030
Antimony	mg/L	0.006	-	-	<0.00040	<0.006	<0.0060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic	mg/L	0.005	-	-	-	-	-	-	-	0.0004	0.00041	0.00037	0.00037	0.00037	0.00035
Barium	mg/L	1	0.016	0.0117	0.0173	0.01	0.012	0.011	0.017	0.012	0.014	0.016	0.015	0.016	0.015
Beryllium	mg/L	-	-	-	-	-	-	-	-	<0.0010	<0.0010	<0.001	-	<0.0010	
Boron	mg/L	1	-	-	-	-	-	-	-	0.071	0.075	0.062	0.069	0.058	0.05
Cadmium	mg/L	0.00004-0.00037 [2]	*<0.001*	*<0.0010*	<0.000050	<0.000050	0.000053	0.00004	<0.000025	<0.00002	<0.000020	<0.000020	<0.000020	<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	<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	<0.00030	<0.00030	
Copper	mg/L	0.007	0.009	0.0072	0.009	0.003	<0.0020	0.0014	0.0012	0.0007	0.0013	0.00064	0.0012	0.0016	0.0038
Lead	mg/L	0.001-0.007 [2]	<0.005	<0.0050	<0.00010	<0.002	<0.0020	<0.00020	<0.0002	<0.00020	0.00037	<0.00020	<0.00020	<0.00020	<0.00020
Lithium	mg/L	-	-	-	-	-	-	-	-	0.17	0.17	-	-	0.13	
Manganese	mg/L	0.05	-	-	-	-	-	-	-	0.15	0.046	0.15	0.057	0.085	0.11
Mercury	mg/L	0.000005	-	*<0.00010*	*<0.00010*	<0.000005	0.0000033	<0.0000050	<0.0000050	<0.0000050	0.0000068	<0.0000020	0.0000035	<0.0000020	<0.0000019
Molybdenum	mg/L	-	<0.005	<0.0050	<0.0050	<0.002	<0.0020	0.0009	0.0011	0.00074	0.00072	0.00066	0.00056	0.00055	
Nickel	mg/L	0.007-0.170 [2]	0.015	0.0136	0.0123	0.005	0.0053	0.0039	0.0035	0.0039	0.0044	0.004	0.0037	0.0035	0.005
Phosphorus	mg/L	-	-	-	-	-	-	-	-	<0.10	<0.10	<0.1	-	<0.10	
Selenium	mg/L	0.002	-	-	-	-	-	-	-	<0.00020	<0.00020	<0.00020	<0.0002	<0.00020	<0.00020
Silicon	mg/L	-	-	-	-	-	-	-	-	4.1	4.1	4.9	-	4.9	
Silver	mg/L	0.0001	-	-	-	-	-	-	-	<0.00010	<0.00010	<0.0001	<0.00010	<0.00010	<0.00010
Strontium	mg/L	-	-	-	-	-	-	-	-	1.6	1.5	1.7	-	1.3	
Sulphur	mg/L	-	-	-	-	-	-	-	-	550	510	360	-	320	
Thallium	mg/L	-	-	-	-	-	-	-	-	<0.00020	<0.00020	<0.0002	-	<0.00020	
Tin	mg/L	-	-	-	-	-	-	-	-	<0.0010	<0.0010	<0.001	-	<0.0010	
Titanium	mg/L	-	-	-	-	-	-	-	-	<0.0010	0.0011	<0.001	-	<0.0010	
Uranium	mg/L	0.01	-	-	-	-	-	-	-	0.0011	0.00091	0.0044	0.0042	0.0039	0.0068
Vanadium	mg/L	-	-	-	-	-	-	-	-	<0.0010	<0.0010	<0.001	-	<0.0010	
Zinc	mg/L	0.03	0.011	0.0102	0.0041	<0.03	<0.030	0.005	<0.0030	<0.0030	0.0047	<0.0030	<0.0030	<0.0030	<0.0030

Notes:

[1] Alberta Environment and Parks (AEP). 2019. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. 198 pp. Referenced guidelines are for fine textured soils under Agricultural land use

[2] Guideline varies with hardness

[3] Guideline varies with chloride

[4] Guideline varies with pH and temperature

[5] Guideline varies with pH

"-" No applicable guideline or not analyzed

Detection limit adjusted (*)

Exceeds Regulatory Limit

Italic - Detection limit greater than Tier 1 Guideline

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	Jun-18	Jun-19	Jun-20
Volatile Organic Compounds (VOCs)															
Bromodichloromethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Bromoform	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Bromomethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	
Carbon tetrachloride	mg/L	0.002	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Chlorobenzene	mg/L	0.0013	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Chloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	
Chloroform	mg/L	0.08	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Chloromethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	
Dibromochloromethane	mg/L	0.1	-	-	-	-	-	-	-	-	-	-	-	<0.0010	<0.0010
1,2-Dibromoethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	<0.00020	
1,2-Dichlorobenzene	mg/L	0.0007	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,3-Dichlorobenzene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,4-Dichlorobenzene	mg/L	0.001	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,1-Dichloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,2-Dichloroethane	mg/L	0.005	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,1-Dichloroethene	mg/L	0.014	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,2-Dichloroethene (cis)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,2-Dichloroethene (trans)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,2-Dichloropropane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,3-Dichloropropene [cis]	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,3-Dichloropropene [trans]	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Methyl t-Butyl Ether (MTBE)	mg/L	0.015	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Methylene Chloride	mg/L	0.05	-	-	-	-	-	-	-	-	-	-	-	<0.0020	<0.0020
Methyl Methacrylate	mg/L	0.47	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Styrene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,1,1,2-Tetrachloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	
1,1,2,2-Tetrachloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	
Tetrachloroethene	mg/L	0.01	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,2,3-Trichlorobenzene	mg/L	0.008	-	-	-	-	-	-	-	-	-	-	-	<0.0010	<0.0010
1,2,4-Trichlorobenzene	mg/L	0.015	-	-	-	-	-	-	-	-	-	-	-	<0.0010	<0.0010
1,3,5-Trichlorobenzene	mg/L	0.014	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,1,1-Trichloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,1,2-Trichloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Trichloroethene	mg/L	0.005	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Trichlorofluoromethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Trihalomethanes	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	<0.0013	<0.0013
1,2,4-Trimethylbenzene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,3,5-Trimethylbenzene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Vinyl chloride	mg/L	0.002	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050

Notes:

[1] Alberta Environment and Parks (AEP). 2019. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. 198 pp. Referenced guidelines are for fine textured soils under Agricultural land use

[2] Guideline varies with hardness

[3] Guideline varies with chloride

[4] Guideline varies with pH and temperature

[5] Guideline varies with pH

"-" No applicable guideline or not analyzed

Detection limit adjusted (*)

Exceeds Regulatory Limit

Italic - Detection limit greater than Tier 1 Guideline

Table E19A: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 19A																													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	Jun-18	Jun-19	Jun-20
Field Measurements																																							
Field pH	-	-	8.6	8.8	-	8.1	7.11	7.95	7.25	7.96	-	-	8	-	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	8.1	7.92	7.91
Field EC	mS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	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	6	7.39	7.27	6.68
Field Temperature	°C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	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	-	7.7	12	11.1	8
Routine Water																																							
pH	-	6.5 - 8.5	8.46	8.42	8.42	8.44	8.13	7.99	8.51	8.65	-	-	8.12	-	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	8.22	8.24	7.97
Conductivity (EC)	µS/cm	1000	4310	3060	2570	3120	5310	4470	4690	3320	-	-	4370	-	4700	3570	4880	5940	5640	5730	6080	5700	6240	7070	7250	7270	7200	7750	8100	8300	6200	7900	7500	6900	6900	7000	7500	6600
Calcium	mg/L	-	33.2	10.9	21	19	36.7	26.7	36.9	16.1	-	-	25.6	-	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	63	64	56
Magnesium	mg/L	-	17.5	1.5	19.8	12.4	12.5	6.4	19.2	8.27	-	-	4.31	-	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	21	23	19
Sodium	mg/L	200	1080	729	785	776	1470	1360	1390	839	-	-	1090	-	1200	1050	1320	1590	1440	1490	1500	1470	1530	1800	1830	1860	1740	1810	2000	2300	1500	2200	1900	1500	1700	1700	1700	1700
Potassium	mg/L	-	13.6	4.68	22.5	9.12	6.92	5.22	10.3	5.7	-	-	4.3	-	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	7.4	<30	6.5
Iron	mg/L	0.3	37.3	0.26	20.5	66.9	1.76	0.166	-	-	-	-	0.057	-	<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	<0.6	<0.60	
Sulphate	mg/L	128-429 [2]	1660	867	655	633	2200	1750	1880	728	-	-	1480	-	1720	1060	1870	2470	2240	2170	2480	2340	2410	2930	3230	3150	3180	3360	3900	3900	2600	3700	3400	3000	2800	2900	2800	2600
Chloride	mg/L	100	11.8	10.9	9.9	36.5	1.8	10.8	5.4	7.8	-	-	4.7	-	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	8.2	9.4	15
Bicarbonate	mg/L	-	749	887	1150	1230	1250	1200	1100	1080	-	-	1250	-	1190	1300	1200	1160	1170	1170	1150	1190	1100	1160	1170	1210	1190	1160	1100	1200	1100	1200	1200	1100	1200	1200	1200	1100
Carbonate	mg/L	-	-	-	-	-	-	-	57	79	-	-	<6	-	<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	<1.0	<1.0	<1.0
Hydroxide	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.50	<0.50	<0.5	<1.0	<1.0	<1.0
Nitrate (N)	mg/L	3	-	-	-	-	1.55	1.26	1.02	9.04	-	-	3.01	-	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	0.022	<0.10	0.011
Nitrite (N)	mg/L	0.02 - 0.20 [3]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.015	<0.050	0.28	<0.010	0.11	<0.010
Nitrate and Nitrate (N)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.038	<0.020	-	0.022	<0.14	<0.014
Total Dissolved Solids (TDS)	mg/L	500	3210	2070	2100	2140	4340	3740	3940	2220	-	-	3230	-	3540	2770	3840	4710	4290	4310	4630	4470	4600	5440	5760	5740	5620	5620	6600	6900	4700	6700	6000	5200	5200	5300	5200	5000
Hardness	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	310	270	270	250	250	220
Alkalinity (total as CaCO3)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	950	880	970	980	980	920
Alkalinity (pp as CaCO3)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.50	<0.50	<0.5	-	<1.0	
Ionic Balance	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.96	0.91	2.2	0.51	0.96	3.9
Water Nutrients																																							
Ammonia-N	mg/L	0.018-190 [4]	1.62	1.58	0.23	0.78	0.88	1.1	1.39	0.71	-	-	0.32	-	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	1.2	0.87	1.2
TKN	mg/L	-	25.8	9.91	5.66	2.72	1.28	2.21	1.97	2.16	-	-	1.11	-	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	1.5	1.2	1.8
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	<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	<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	<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	<0.00089	<0.00089	<0.00089	<0.00089
F1 (C6-C10)	mg/L	2.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	1.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	<0.050	<0.25	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Organics																																							
COD	mg/L	-	3580	1660	526	402	71	180	131	114	-	-	22	-	171	227	146	20	10	25	18	18	20	20	16	14	13.7	20	25	28	22	20	25	19	27	23	23	20
TOC	mg/L	-	214	10.8	11.6	17.5	8.1	13.6	5.6	10.8	-	-	7.2	-	7.5	14.2	7.4	7	6	7	7	8	8	8	9	-	-	-	-	-	-	-	-	-	-	-	-	
DOC	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7	6.8	7.7	8.1	7.3	6.8	6	7.5	7.1	7.1	8	8.3	8.6
Oil & Grease	mg/L	-	-	-	-	-	<1	2	-	-	-	-	<5	-	7	<1	<5	<1	<1	<1	<1	<1	<1	<1	<1	-	-	-	-	-	-	-	-	-	-	-	-	
Metals																																							
Aluminum	mg/L	0.0007 / 0.05 [5]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.030	0.0072	<0.0030	<0.003	<0.0030	<0.0030
Antimony	mg/L	0.006	<0.005	-	-	-	<0.005	<0.005	-	-	-	-	<0.02	-	0.001	0.0012	0.0012	0.001	0.0018	0.001	0.0008	0.0008	0.0007	0.0006	0.0012	-	-	0.00068	<0.006	<0.0060	<0.006	<0.0060	<0.0060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic	mg/L	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00065	0.00054	0.00056	0.00056	0.00091	0.00091
Barium	mg/L	1	0.0625	-	-	-	0.0858	0.0377	-	-	-	-	0.0225	-	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	<0.010	<0.10	<0.10	<1.0	0.026
Beryllium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.010	<0.0010	<0.001	-	<0.0010	
Boron	mg/L	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.40	0.41	0.43	0.47	0.45	0.41
Cadmium	mg/L	0.00004-0.00037 [2]	<0.0005	-	-	-	<0.0005	<0.005	-	-	-	-	<0.003	-	<0.00005	<0.00005	0.00004	<0.001	<0.001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0002	<0.001	<0.0010	0.000115	0.0008	0.000092	<0.000050	0.000055	<0.0020	0.000039	<0.000020	<0.00002	<0.000020	<0.000020
Chromium	mg/L	0.05	0.0024	-	-	-	0.0033	<0.0008	-	-	-	-	<0.004	-	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	<0.0010	<0.0010	<0.0010
Cobalt	mg/L	-	0.0012	-	-	-	0.003	0.0059	-	-	-	-	0.0085	-	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	0.0009	0.00042	
Copper	mg/L	0.007	<0.001	-	-	-	0.002	0.001	-	-	-	-	<0.005	-	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	0.00022	0.00078	0.0011
Lead	mg/L	0.001-0.007 [2]	<0.002	-	-	-	<0.002	<0.002	-	-	-	-	<0.01	-	<0.0005	<0.0005	0.0003	<0.005	<0.005	0.002	<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	<0.00020	<0.00020	<0.00020
Lithium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.56	0.51	-	-	<2.0	
Manganese	mg/L	0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.39	0.36	0.4	0.71	0.40	0.53
Mercury	mg/L	0.000005	-	-	<0.0001	<0.0001	<0.0001	-	-	-	-	-	<0.0001	-	<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	<0.000020	<0.000002	<0.0000020	<0.0000019
Molybdenum	mg/L	0.082	-	-	-	-	0.005	0.005	-	-	-	-	0.005	-	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	0.003	0.0023	
Nickel	mg/L	0.007-0.170 [2]	0.008	-	-	-	0.004	0.002	-	-	-	-	0.008	-	0.0039	<0.0025	0.0072	<0.002	0.003	0.003	0.005	0.003	0.005	0.008	0.008	0.009	0.005	0.0111	<0.005	<0.0050	<0.0050	<0.0050	0.0028	0.0017	0.0029	0.0015	0.0037
Phosphorus	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.10	<0.10	<1	-	<10	
Selenium	mg/L	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Silicon	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.9	4.5	4.4	-	<10	
Silver	mg/L	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	<0.00010	<0.0001	<0.00010	<0.00010	
Strontium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.4	1.3	1.5	-	<2.0	
Sulphur	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1100	980	980	-	1000	
Thallium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	<0.00020	<0.0002	-	<0.00020	
Tin	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.010	<0.0010	<0.001	-	<0.0010	
Titanium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.010	<0.0010	<0.001	-	<0.0010	
Uranium	mg/L	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.005	0.006	0.006	0.006	0.0070	0.0075
Vanadium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.010	<0.0010	<0.001	-	<0.0010	
Zinc	mg/L	0.03	0.0013	-	-	-	0.0039	0.0021	-	-	-	-	0.022	-	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	<0.0030	<0.0030	<0.0030

Notes:

[1] Alberta Environment and Parks (AEP). 2019. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. 198 pp. Referenced guidelines are for fine textured soils under Agricultural land use

[2] Guideline varies with hardness

[3] Guideline varies with chloride

[4] Guideline varies with pH and temperature

[5] Guideline varies with pH

"-" No applicable guideline or not analyzed

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

italic - Detection limit greater than Tier 1 Guideline

Table E19A: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 19A																													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	Jun-18	Jun-19	Jun-20
Volatile Organic Compounds (VOCs)																																							
Bromodichloromethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Bromoform	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Bromomethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	
Carbon tetrachloride	mg/L	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Chlorobenzene	mg/L	0.0013	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Chloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	
Chloroform	mg/L	0.08	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Chloromethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	
Dibromochloromethane	mg/L	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	<0.0010
1,2-Dibromoethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00020	
1,2-Dichlorobenzene	mg/L	0.0007	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,3-Dichlorobenzene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,4-Dichlorobenzene	mg/L	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,1-Dichloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,2-Dichloroethane	mg/L	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,1-Dichloroethene	mg/L	0.014	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,2-Dichloroethene (cis)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,2-Dichloroethene (trans)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,2-Dichloropropane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,3-Dichloropropene [cis]	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,3-Dichloropropene [trans]	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Methyl t-Butyl Ether (MTBE)	mg/L	0.015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Methylene Chloride	mg/L	0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	<0.0020
Methyl Methacrylate	mg/L	0.47	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Styrene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,1,1,2-Tetrachloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	
1,1,2,2-Tetrachloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	
Tetrachloroethene	mg/L	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,2,3-Trichlorobenzene	mg/L	0.008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	<0.0010
1,2,4-Trichlorobenzene	mg/L	0.015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	<0.0010
1,3,5-Trichlorobenzene	mg/L	0.014	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,1,1-Trichloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,1,2-Trichloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Trichloroethene	mg/L	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Trichlorofluoromethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Trihalomethanes	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0013	<0.0013
1,2,4-Trimethylbenzene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,3,5-Trimethylbenzene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Vinyl chloride	mg/L	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050

Notes:

[1] Alberta Environment and Parks (AEP). 2019. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. 198 pp. Referenced guidelines are for fine textured soils under Agricultural land use

[2] Guideline varies with hardness

[3] Guideline varies with chloride

[4] Guideline varies with pH and temperature

[5] Guideline varies with pH

"-" No applicable guideline or not analyzed

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

#alic - Detection limit greater than Tier 1 Guideline

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	Jun-18	Jun-19	Jun-20
Field Measurements															
Field pH	-	-	7.453	7.514	bent	7.65	7.75	5.32	7.5	8.4	8.09	8.2	8.2	8.23	8.48
Field EC	mS	-	6.390	6.480	bent	6.24	2.81	7.51	8.08	6.26	7.17	6.43	6.1	6.01	6.44
Field Temperature	°C	-	6.2	7.9	bent	10.7	7.9	8	8.3	6.5	-	7	8	12.3	7.6
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	8.3	8.46	8.3
Conductivity (EC)	µS/cm	1000	6290	6430	6370	6200	6500	8200	6000	5900	5700	5800	5800	5900	6300
Calcium	mg/L	-	68.6	62.6	63.2	62	61	77	29	32	31	29	30	26	33
Magnesium	mg/L	-	27.7	25.1	23.3	23	25	35	20	17	17	18	17	17	21
Sodium	mg/L	200	1580	1470	1440	1500	1800	2000	1500	1500	1300	1400	1400	930	1600
Potassium	mg/L	-	6.3	8	8.35	8.9	8.8	8.7	6.7	7.4	7.6	7.5	7.7	7.3	7.8
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	<0.6	<0.060	0.29
Sulphate	mg/L	128-429 [2]	2630	2700	2530	2600	2800	3700	2600	2400	2200	2000	2200	2100	2500
Chloride	mg/L	100	5	3.64	<10 *	4	4.2	9.8	2.6	3.1	3.1	2.7	2.8	3.3	5
Bicarbonate	mg/L	-	1140	1130	1110	1100	1100	1200	1100	1100	1000	1100	1100	1000	1100
Carbonate	mg/L	-	<5	<5.0	<5.0	<0.5	19	<0.50	5	<0.50	13	22	<1.0	33	4.8
Hydroxide	mg/L	-	-	-	-	-	-	-	-	<0.50	<0.50	<0.5	<1.0	<1.0	<1.0
Nitrate (N)	mg/L	3	<0.1	0.279	<1.0 *	0.032	0.015	0.21	<0.010	<0.010	0.015	<0.044	0.038	0.026	0.024
Nitrite (N)	mg/L	0.02 - 0.20 [3]	-	-	-	-	-	-	-	<0.010	0.013	0.11	0.012	0.011	0.01
Nitrate and Nitrate (N)	mg/L	-	-	-	-	-	-	-	-	<0.010	0.028	-	0.049	0.036	0.034
Total Dissolved Solids (TDS)	mg/L	500	4880	4830	4610	4800	5200	6500	4700	4500	4100	4100	4300	3600	4800
Hardness	mg/L	-	-	-	-	-	-	-	-	150	150	150	150	130	170
Alkalinity (total as CaCO3)	mg/L	-	-	-	-	-	-	-	-	900	860	910	910	900	920
Alkalinity (pp as CaCO3)	mg/L	-	-	-	-	-	-	-	-	<0.50	11	18	-	27	
Ionic Balance	N/A	-	-	-	-	-	-	-	-	0.98	0.96	3.6	0.54	18	2.9
Water Nutrients															
Ammonia-N	mg/L	0.018-190 [4]	0.64	0.382	0.569	0.64	0.73	1	0.76	0.76	0.73	0.84	0.63	0.63	0.81
TKN	mg/L	-	1	0.8	1.51	1.6	1.1	1.6	1.1	1.1	1.1	1.0	1.1	1.1	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	<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	<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	<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	<0.00089	<0.00089	<0.00089
F1 (C6-C10)	mg/L	2.2	<0.1	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	1.1	<0.05	<0.050	<0.25	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Organics															
COD	mg/L	-	-	13.7	10.8	86	22	27	28	17	17	17	34	33	18
TOC	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	
DOC	mg/L	-	-	5.2	6.1	6.1	5.9	8.2	5	5.7	6.0	6.3	6.1	5.3	6.6
Oil and Grease	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	
Metals															
Aluminum	mg/L	0.0007 / 0.05 [5]	-	-	-	-	-	-	-	<0.030	<0.0030	0.0034	<0.003	<0.0030	0.0036
Antimony	mg/L	0.006	-	-	<0.00040	<0.006	<0.0060	<0.006	<0.0060	<0.0060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic	mg/L	0.005	-	-	-	-	-	-	-	0.0021	0.0025	0.0017	0.0017	0.0023	0.0021
Barium	mg/L	1	-	0.0148	0.0188	0.02	0.019	0.02	<0.10	0.027	0.029	<0.10	<0.1	0.024	0.036
Beryllium	mg/L	-	-	-	-	-	-	-	-	<0.010	<0.0010	<0.001	-	<0.0010	
Boron	mg/L	1	-	-	-	-	-	-	-	0.47	0.48	0.52	0.49	0.53	0.48
Cadmium	mg/L	0.00004-0.00037 [2]	*<0.001*	*<0.0010*	<0.000050	<0.00005	*<0.050*	0.00011	<0.000050	<0.00020	<0.000020	<0.000020	<0.000020	<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	<0.0010	<0.0010	<0.0010
Cobalt	mg/L	-	<0.002	<0.0020	<0.0020	<0.003	<0.0030	<0.0030	<0.0030	<0.0030	0.0003	<0.00030	<0.00030	<0.00030	
Copper	mg/L	0.007	0.005	0.0062	0.0071	<0.002	<0.0020	<0.0020	<0.0020	<0.0020	0.00023	<0.00020	<0.0002	<0.00020	0.00032
Lead	mg/L	0.001-0.007 [2]	<0.005	<0.0050	<0.00010	<0.002	<0.0020	<0.0020	<0.0020	<0.0020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Lithium	mg/L	-	-	-	-	-	-	-	-	0.48	0.47	-	-	0.49	
Manganese	mg/L	0.05	-	-	-	-	-	-	-	0.21	0.21	0.19	0.17	0.088	0.16
Mercury	mg/L	0.000005	-	*<0.00010*	*<0.00010*	<0.000005	<0.0020	<0.0000050	<0.0000050	<0.0000050	<0.0000020	<0.0000020	<0.0000020	<0.0000020	<0.0000019
Molybdenum	mg/L	-	0.007	<0.0050	<0.0050	<0.002	<0.0020	0.0021	0.0029	<0.0020	0.0020	0.0016	0.0016	0.0017	
Nickel	mg/L	0.007-0.170 [2]	0.005	0.0041	0.0057	<0.005	<0.0050	<0.0050	<0.0050	<0.0050	0.0025	<0.00050	0.00082	<0.00050	0.00068
Phosphorus	mg/L	-	-	-	-	-	-	-	-	0.11	<0.10	<1	-	<0.10	
Selenium	mg/L	0.002	-	-	-	-	-	-	-	<0.0020	<0.00020	<0.00020	<0.0002	<0.00020	<0.00020
Silicon	mg/L	-	-	-	-	-	-	-	-	4.5	4.4	4.7	-	4.5	
Silver	mg/L	0.0001	-	-	-	-	-	-	-	<0.0010	<0.00010	<0.0001	<0.00010	<0.00010	<0.00010
Strontium	mg/L	-	-	-	-	-	-	-	-	1.1	1.1	1.2	-	1.0	
Sulphur	mg/L	-	-	-	-	-	-	-	-	770	750	750	-	540	
Thallium	mg/L	-	-	-	-	-	-	-	-	<0.0020	<0.00020	<0.0002	-	<0.00020	
Tin	mg/L	-	-	-	-	-	-	-	-	<0.010	<0.0010	<0.001	-	<0.0010	
Titanium	mg/L	-	-	-	-	-	-	-	-	<0.010	<0.0010	<0.001	-	<0.0010	
Uranium	mg/L	0.01	-	-	-	-	-	-	-	<0.0010	0.00021	0.00024	0.00027	0.00025	0.00022
Vanadium	mg/L	-	-	-	-	-	-	-	-	<0.010	<0.0010	<0.001	-	<0.0010	
Zinc	mg/L	0.03	0.012	0.0094	0.0046	<0.030	<0.030	<0.030	<0.030	<0.030	<0.0030	<0.0030	<0.0030	<0.0030	<0.003

Notes:

[1] Alberta Environment and Parks (AEP). 2019. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. 198 pp. Referenced guidelines are for fine textured soils under Agricultural land use

[2] Guideline varies with hardness

[3] Guideline varies with chloride

[4] Guideline varies with pH and temperature

[5] Guideline varies with pH

"-" No applicable guideline or not analyzed

Detection limit adjusted (*)

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

Exceeds Regulatory Limit

Italic - Detection limit greater than Tier 1 Guideline

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	Jun-18	Jun-19	Jun-20
Volatile Organic Compounds (VOCs)															
Bromodichloromethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Bromoform	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Bromomethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	
Carbon tetrachloride	mg/L	0.002	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Chlorobenzene	mg/L	0.0013	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Chloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	
Chloroform	mg/L	0.08	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Chloromethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	
Dibromochloromethane	mg/L	0.1	-	-	-	-	-	-	-	-	-	-	-	<0.0010	<0.0010
1,2-Dibromoethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	<0.00020	
1,2-Dichlorobenzene	mg/L	0.0007	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,3-Dichlorobenzene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,4-Dichlorobenzene	mg/L	0.001	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,1-Dichloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,2-Dichloroethane	mg/L	0.005	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,1-Dichloroethene	mg/L	0.014	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,2-Dichloroethene (cis)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,2-Dichloroethene (trans)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,2-Dichloropropane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,3-Dichloropropene [cis]	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,3-Dichloropropene [trans]	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Methyl t-Butyl Ether (MTBE)	mg/L	0.015	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Methylene Chloride	mg/L	0.05	-	-	-	-	-	-	-	-	-	-	-	<0.0020	<0.0020
Methyl Methacrylate	mg/L	0.47	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Styrene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,1,1,2-Tetrachloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	
1,1,2,2-Tetrachloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	
Tetrachloroethene	mg/L	0.01	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,2,3-Trichlorobenzene	mg/L	0.008	-	-	-	-	-	-	-	-	-	-	-	<0.0010	<0.0010
1,2,4-Trichlorobenzene	mg/L	0.015	-	-	-	-	-	-	-	-	-	-	-	<0.0010	<0.0010
1,3,5-Trichlorobenzene	mg/L	0.014	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,1,1-Trichloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,1,2-Trichloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Trichloroethene	mg/L	0.005	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Trichlorofluoromethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Trihalomethanes	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	<0.0013	<0.0013
1,2,4-Trimethylbenzene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,3,5-Trimethylbenzene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Vinyl chloride	mg/L	0.002	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050

Notes:

[1] Alberta Environment and Parks (AEP). 2019. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. 198 pp. Referenced guidelines are for fine textured soils under Agricultural land use

[2] Guideline varies with hardness

[3] Guideline varies with chloride

[4] Guideline varies with pH and temperature

[5] Guideline varies with pH

"-" No applicable guideline or not analyzed

Detection limit adjusted (*)

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

Exceeds Regulatory Limit

Italic - Detection limit greater than Tier 1 Guideline

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
Field Measurements															
Field pH	-	-	8.1	8.3	-	8.1	7.5	7.91	7.63	7.62	7.8	7.93	7.8	7.98	8.04
Field EC	mS	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Field Temperature	°C	-	-	-	-	-	-	-	-	-	-	-	-	-	-
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
Conductivity (EC)	µS/cm	1000	3660	3730	2950	3210	3160	3510	3410	3250	3290	3320	3330	3210	3230
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
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
Sodium	mg/L	200	870	924	912	773	797	798	908	775	753	933	714	903	748
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
Iron	mg/L	0.3	0.16	6.73	43.9	1.65	0.026	-	2.2	-	0.022	1.02	0.059	0.908	<0.05
Sulphate	mg/L	128-429 [2]	1450	1360	1110	830	749	849	960	784	945	1030	804	957	784
Chloride	mg/L	100	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
Bicarbonate	mg/L	-	612	797	997	1030	1090	1140	1120	1050	1140	1120	1150	1160	1190
Carbonate	mg/L	-	-	-	-	-	17.9	-	-	46	<6	<6	<6	<6	<6
Hydroxide	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrate (N)	mg/L	3	-	-	-	-	2.31	1.88	4.02	3.36	3.9	4.4	3.92	3.89	3.06
Nitrite (N)	mg/L	0.02 - 0.20 [3]	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrate and Nitrate (N)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Dissolved Solids (TDS)	mg/L	500	2720	2740	2560	2200	2130	2240	2470	2170	2270	2550	2110	2470	2150
Hardness	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Alkalinity (total as CaCO3)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Alkalinity (pp as CaCO3)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ionic Balance	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Water Nutrients															
Ammonia-N	mg/L	0.018-190 [4]	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
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
Hydrocarbons															
Benzene	mg/L	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-
Toluene	mg/L	0.024	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	mg/L	0.0016	-	-	-	-	-	-	-	-	-	-	-	-	-
Xylene	mg/L	0.02	-	-	-	-	-	-	-	-	-	-	-	-	-
F1 (C6-C10)	mg/L	2.2	-	-	-	-	-	-	-	-	-	-	-	-	-
F2 (>C10-C16)	mg/L	1.1	-	-	-	-	-	-	-	-	-	-	-	-	-
Organics															
COD	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOC	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DOC	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Oil & Grease	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Metals															
Aluminum	mg/L	0.0007 / 0.05 [5]	-	-	-	-	-	-	-	-	-	-	-	-	-
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
Arsenic	mg/L	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-
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
Beryllium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Boron	mg/L	1	-	-	-	-	-	-	-	-	-	-	-	-	-
Cadmium	mg/L	0.00004-0.00037 [2]	*<0.0005*	*<0.0005*	-	<0.0005	<0.0005	-	<0.0005	-	<0.0006	*<0.003*	*<0.003*	<0.0005	<0.00005
Chromium	mg/L	0.05	0.001	0.0009	-	0.0009	0.0017	-	0.0014	-	<0.0009	<0.004	<0.004	<0.0008	0.0044
Cobalt	mg/L	-	0.0021	0.0018	-	0.0011	0.0029	-	0.0028	-	0.0032	0.0072	0.006	0.0027	0.0014
Copper	mg/L	0.007	0.001	0.004	-	0.003	0.004	-	0.005	-	0.002	<0.006	0.005	0.004	<0.005
Lead	mg/L	0.001-0.007 [2]	<0.002	<0.002	-	0.006	0.002	-	0.002	-	<0.002	*<0.01*	*<0.01*	<0.002	<0.0005
Lithium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Manganese	mg/L	0.05	-	-	-	-	-	-	-	-	-	-	-	-	-
Mercury	mg/L	0.000005	*<0.0001*	*<0.0001*	*<0.0001*	*<0.0001*	*<0.0001*	-	*<0.0001*	-	*<0.0001*	*<0.0001*	*<0.0001*	-	*<0.0001*
Molybdenum	mg/L	-	14.5	0.024	-	0.005	0.009	-	0.006	-	0.004	0.006	<0.005	0.003	<0.005
Nickel	mg/L	0.007-0.170 [2]	0.011	0.011	-	0.008	0.004	-	0.006	-	0.003	<0.006	0.009	0.003	0.0041
Phosphorus	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Selenium	mg/L	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-
Silicon	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silver	mg/L	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-
Strontium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sulphur	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Thallium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tin	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Titanium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Uranium	mg/L	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-
Vanadium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Zinc	mg/L	0.03	0.0068	0.0272	-	0.0131	0.0218	-	0.0249	-	0.0241	0.029	0.026	0.0128	0.008

Parameter ID	MW 20A															
	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
Field Measurements																
Field pH	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	-
Field EC	-	-	-	-	4.28	9.81 (EF)	4.27	3.62	7.94	7.74	4.050	2	2.9	3.4	1.999	3.98
Field Temperature	-	-	-	-	12.3	3.7	7.5	6.4	7.7	11.46	7.9	11.2	15.5	10	8.7	8.4
Routine Water																
pH	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
Conductivity (EC)	3480	3670	3880	3920	3840	3900	3480	3500	3310	3310	4110	3650	3440	3400	3400	3400
Calcium	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
Magnesium	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
Sodium	879	934	984	934	944	966	862	870	824	866	980	841	792	850	930	800
Potassium	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
Iron	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
Sulphate	1140	1290	1220	1150	1200	1300	1040	900	772	789	1340	1040	835	830	830	800
Chloride	4.5	2.4	3	4	4	4	6	6	7	8	8	6.22	5.6	8	6.9	6.7
Bicarbonate	1130	1100	1130	1130	1130	1110	1140	1120	1210	1260	1110	1150	1180	1200	1200	1200
Carbonate	<6	<6	<5	7	<5	<5	<5	24	16	<5	<5	17.5	<5.0	<0.5	15	18
Hydroxide	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrate (N)	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
Nitrite (N)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrate and Nitrate (N)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Dissolved Solids (TDS)	2610	2800	2830	2680	2760	2860	2520	2400	2260	2330	2970	2520	2270	2300	2400	2300
Hardness	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Alkalinity (total as CaCO3)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Alkalinity (pp as CaCO3)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ionic Balance	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Water Nutrients																
Ammonia-N	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
TKN	1.29	1.28	< 0.2	0.7	0.7	0.4	0.4	0.6	1.2	0.8	1.1	-	0.87	1.1	1	1.3
Hydrocarbons																
Benzene	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.0004	<0.00040	<0.00040
Toluene	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040
Ethylbenzene	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040
Xylene	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050	<0.0010	<0.0008	<0.00080	<0.00080
F1 (C6-C10)	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050	<0.10	<0.1	<0.10	<0.10
F2 (>C10-C16)	-	-	-	-	-	-	-	-	-	-	<0.1	<0.10	<0.25	<0.1	<0.10	<0.10
Organics																
COD	-	-	-	-	-	-	-	-	-	-	-	-	<5.0	38	45	75
TOC	-	-	-	-	-	-	-	-	-	-	11	6.8	-	-	-	-
DOC	-	-	-	-	-	-	-	-	-	-	-	-	5.5	9.6	5.9	5.2
Oil & Grease	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Metals																
Aluminum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Antimony	<0.001	<0.002	0.0007	0.0026	0.0009	<0.0004	0.0006	0.0006	<0.0004	0.0007	-	-	<0.00040	<0.0006	<0.0030	<0.00060
Arsenic	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Barium	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
Beryllium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Boron	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cadmium	<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
Chromium	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
Cobalt	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	<0.0003	<0.0015	<0.00030
Copper	<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
Lead	<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
Lithium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Manganese	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mercury	*<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
Molybdenum	<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
Nickel	<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
Phosphorus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Selenium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silicon	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silver	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Strontium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sulphur	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Thallium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tin	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Titanium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Uranium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vanadium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Zinc	<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

Parameter ID	MW 20A						
	May-14	Jun-15	Jun-16	Jun-17	Jun-18	Jun-19	Jun-20
Field Measurements							
Field pH	8.0	8.2	8.6	7.8	7.8	7.60	7.52
Field EC	3.5	3.31	3.57	3	3.12	2.61	3.77
Field Temperature	7.8	7.9	8.1	6.9	6.5	9.8	9.1
Routine Water							
pH	8.05	8.03	8.15	8.34	8.08	8.28	8.17
Conductivity (EC)	3300	3100	3300	3200	3400	3400	3700
Calcium	19	18	19	18	21	21	32
Magnesium	2.7	2.4	2.5	2.4	2.8	2.7	5.2
Sodium	800	750	830	780	850	820	960
Potassium	3.3	3.5	3.3	2.9	3.4	3.4	3.7
Iron	0.44	<0.060	<0.060	<0.060	<0.06	<0.060	
Sulphate	800	680	740	660	820	740	1000
Chloride	6.9	8.3	7.0	7.9	8.1	7.1	6.4
Bicarbonate	1300	1200	1300	1200	1300	1300	1100
Carbonate	<0.50	<0.50	<0.50	5.5	<1.0	<1.0	<1.0
Hydroxide	-	<0.50	<0.50	<0.5	<1.0	<1.0	<1.0
Nitrate (N)	1.8	6.6	3.1	21	2.8	3.0	1.8
Nitrite (N)	-	0.061	0.041	0.28	0.036	0.057	0.023
Nitrate and Nitrate (N)	-	6.7	3.1	4.9	2.8	3.1	1.8
Total Dissolved Solids (TDS)	2300	2100	2200	2100	2300	2200	2600
Hardness	-	54	58	54	64	65	100
Alkalinity (total as CaCO3)	-	1000	1100	1000	1000	1000	920
Alkalinity (pp as CaCO3)	-	<0.50	<0.50	4.6	-	<1.0	
Ionic Balance	-	0.96	1.0	0.38	0.042	0.70	4.50
Water Nutrients							
Ammonia-N	0.33	0.23	0.53	0.3	0.28	0.17	0.4
TKN	1	0.93	1.2	1.0	1.0	1.0	0.7
Hydrocarbons							
Benzene	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene	<0.00080	<0.00080	<0.00080	<0.00080	<0.00089	<0.00089	<0.00089
F1 (C6-C10)	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Organics							
COD	66	28	19	35	26	38	<10
TOC	-	-	-	-	-	-	
DOC	4.4	5.7	4.3	6.4	5.4	6.9	5.3
Oil & Grease	-	-	-	-	-	-	
Metals							
Aluminum	-	0.0052	0.0040	0.0078	0.004	0.020	<0.0030
Antimony	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic	-	0.00037	0.00051	0.0004	0.0004	0.00042	0.00033
Barium	0.025	0.015	0.018	0.027	0.022	0.023	0.02
Beryllium	-	<0.0010	<0.0010	<0.001	-	<0.0010	
Boron	-	0.80	0.92	0.79	0.88	0.88	0.69
Cadmium	<0.000025	<0.000020	<0.000020	<0.000020	<0.00002	<0.000020	<0.000020
Chromium	0.0019	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Cobalt	0.00057	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	
Copper	0.0036	0.00075	0.00038	0.00031	0.00088	0.00076	0.0003
Lead	0.0003	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Lithium	-	0.20	0.23	-	-	0.24	
Manganese	-	0.026	0.026	0.031	0.016	0.011	0.089
Mercury	<0.0000050	<0.0000050	<0.0000020	<0.0000020	0.000002	<0.0000020	<0.0000019
Molybdenum	0.0016	0.0016	0.0014	0.0015	0.0013	0.0014	
Nickel	0.0031	0.0015	0.0011	0.0014	0.0012	0.0010	0.0010
Phosphorus	-	<0.10	<0.10	<0.1	-	<0.10	
Selenium	-	<0.00020	0.0014	<0.00020	<0.00020	<0.00020	<0.00020
Silicon	-	3.0	3.1	2.9	-	3.0	
Silver	-	<0.00010	<0.00010	<0.0001	<0.00010	<0.00010	<0.00010
Strontium	-	0.37	0.39	0.38	-	0.42	
Sulphur	-	210	240	220	-	270	
Thallium	-	<0.00020	<0.00020	<0.0002	-	<0.00020	
Tin	-	<0.0010	<0.0010	<0.001	-	<0.0010	
Titanium	-	<0.0010	<0.0010	<0.001	-	<0.0010	
Uranium	-	0.0015	0.0016	0.0015	0.0015	0.0016	0.0017
Vanadium	-	<0.0010	<0.0010	<0.001	-	<0.0010	
Zinc	0.0036	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030

Notes:
[1] Alberta Environment and Parks (AEP). 2019. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. 198 pp. Referenced guidelines are for fine textured soils under Agricultural land use
[2] Guideline varies with hardness
[3] Guideline varies with chloride
[4] Guideline varies with pH and temperature
[5] Guideline varies with pH
"-" No applicable guideline or not analyzed
Equipment Failure, parameter not reported (EF)
Detection limit adjusted (*)
Exceeds Regulatory Limit
Italic - Detection limit greater than Tier 1 Guideline

TETRA TECH

Table E20A: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 20A																															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	Jun-18	Jun-19	Jun-20
Volatile Organic Compounds (VOCs)																																								
Bromodichloromethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Bromoform	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Bromomethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	
Carbon tetrachloride	mg/L	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Chlorobenzene	mg/L	0.0013	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Chloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	
Chloroform	mg/L	0.08	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Chloromethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	
Dibromochloromethane	mg/L	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	<0.0010
1,2-Dibromoethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00020	
1,2-Dichlorobenzene	mg/L	0.0007	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,3-Dichlorobenzene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,4-Dichlorobenzene	mg/L	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,1-Dichloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,2-Dichloroethane	mg/L	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,1-Dichloroethene	mg/L	0.014	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,2-Dichloroethene (cis)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,2-Dichloroethene (trans)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,2-Dichloropropane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,3-Dichloropropene [cis]	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,3-Dichloropropene [trans]	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Methyl t-Butyl Ether (MTBE)	mg/L	0.015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Methylene Chloride	mg/L	0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	<0.0020
Methyl Methacrylate	mg/L	0.47	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Styrene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,1,1,2-Tetrachloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	
1,1,2,2-Tetrachloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	
Tetrachloroethene	mg/L	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,2,3-Trichlorobenzene	mg/L	0.008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	<0.0010
1,2,4-Trichlorobenzene	mg/L	0.015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	<0.0010
1,3,5-Trichlorobenzene	mg/L	0.014	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,1,1-Trichloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,1,2-Trichloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Trichloroethene	mg/L	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Trichlorofluoromethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Trihalomethanes	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0013	<0.0013
1,2,4-Trimethylbenzene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,3,5-Trimethylbenzene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Vinyl chloride	mg/L	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050

Notes:
[1] Alberta Environment and Parks (AEP). 2019. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. 198 pp. Referenced guidelines are for fine textured soils under Agricultural land use
[2] Guideline varies with hardness
[3] Guideline varies with chloride
[4] Guideline varies with pH and temperature
[5] Guideline varies with pH
"-" No applicable guideline or not analyzed
Equipment Failure, parameter not reported (EF)
Detection limit adjusted (*)
Exceeds Regulatory Limit
italic - Detection limit greater than Tier 1 Guideline

Table E20B: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits¹	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
Field Measurements														
Field pH	-	-	7.6	7.4	-	7.6	7.11	7.28	7.22	7.66	7.49	7.52	7.49	7.54
Field EC	mS	-	-	-	-	-	-	-	-	-	-	-	-	-
Field Temperature	°C	-	-	-	-	-	-	-	-	-	-	-	-	-
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
Conductivity (EC)	µS/cm	1000	4150	4220	3380	4130	4310	4000	4180	4420	4050	4050	4160	4260
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
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
Sodium	mg/L	200	975	1020	1080	975	1080	967	1030	1080	926	929	924	1020
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
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
Sulphate	mg/L	128-429 ²	1520	1580	1770	1450	1750	1570	1730	1720	1860	1590	1590	1720
Chloride	mg/L	100	1.7	0.4	1	1.3	<0.5	0.7	<0.5	<0.5	1.7	<0.5	0.8	0.8
Bicarbonate	mg/L	-	1080	1060	1090	1080	1100	1090	1090	1080	1080	1080	1100	1060
Carbonate	mg/L	-	-	-	-	-	-	-	-	<6	<6	<6	<6	<6
Hydroxide	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrate (N)	mg/L	3	-	-	-	-	<0.05	<0.05	<0.05	0.505	<0.04	<0.04	0.058	0.045
Nitrite (N)	mg/L	0.02 - 0.20 ³	-	-	-	-	-	-	-	-	-	-	-	-
Nitrate and Nitrate (N)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Dissolved Solids (TDS)	mg/L	500	3150	3220	3520	3090	3430	3200	3440	3460	3520	3180	3190	3400
Hardness	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-
Alkalinity (total as CaCO3)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-
Alkalinity (pp as CaCO3)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-
Ionic Balance	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-
Water Nutrients														
Ammonia-N	mg/L	0.018-190 ⁴	0.183	0.163	0.23	0.15	0.26	0.27	0.15	< 0.05	0.09	0.1	< 0.05	0.12
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
Hydrocarbons														
Benzene	mg/L	0.005	-	-	-	-	-	-	-	-	-	-	-	-
Toluene	mg/L	0.024	-	-	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	mg/L	0.0016	-	-	-	-	-	-	-	-	-	-	-	-
Xylene	mg/L	0.02	-	-	-	-	-	-	-	-	-	-	-	-
F1 (C6-C10)	mg/L	2.2	-	-	-	-	-	-	-	-	-	-	-	-
F2 (>C10-C16)	mg/L	1.1	-	-	-	-	-	-	-	-	-	-	-	-
Organics														
COD	mg/L	-	45	33	48	43	102	12	18	< 5	13	16	< 5	127
TOC	mg/L	-	6.8	8.2	6.8	6.8	6.2	5.8	6.4	5.4	6.8	5.6	5.6	5.3
DOC	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-
Oil & Grease	mg/L	-	0.3	<0.2	10	<1	<1	2	<1	<1	5	<5	<5	6
Metals														
Aluminum	mg/L	0.0007 / 0.05 ⁵	-	-	-	-	-	-	-	-	-	-	-	-
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
Arsenic	mg/L	0.005	-	-	-	-	-	-	-	-	-	-	-	-
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
Beryllium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-
Boron	mg/L	1	-	-	-	-	-	-	-	-	-	-	-	-
Cadmium	mg/L	0.00004-0.00037 ²	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0006	<0.0006	*<0.005*	*<0.003*	*<0.003*
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
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
Copper	mg/L	0.007	<0.001	0.003	<0.001	0.002	<0.001	<0.001	0.001	0.001	0.002	*<0.01*	<0.005	0.006
Lead	mg/L	0.001-0.007 ²	<0.002	<0.002	<0.002	0.003	<0.002	<0.002	0.005	<0.002	<0.002	*<0.02*	*<0.01*	*<0.01*
Lithium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-
Manganese	mg/L	0.05	-	-	-	-	-	-	-	-	-	-	-	-
Mercury	mg/L	0.000005	*<0.0001*	*<0.0001*	*<0.0001*	*<0.0001*	*<0.0001*	*<0.0001*	*<0.0001*	*<0.0001*	*<0.0001*	*<0.001*	*<0.0001*	*<0.0001*
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
Nickel	mg/L	0.007-0.170 ²	0.006	0.004	0.002	0.002	0.004	0.003	0.004	0.004	0.003	<0.01	0.006	0.009
Phosphorus	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-
Selenium	mg/L	0.002	-	-	-	-	-	-	-	-	-	-	-	-
Silicon	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-
Silver	mg/L	0.0001	-	-	-	-	-	-	-	-	-	-	-	-
Strontium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-
Sulphur	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-
Thallium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-
Tin	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-
Titanium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-
Uranium	mg/L	0.01	-	-	-	-	-	-	-	-	-	-	-	-
Vanadium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-
Zinc	mg/L	0.03	0.0079	0.001	0.0105	0.002	0.0115	0.0065	0.0251	0.0144	0.023	0.016	<0.003	<0.003

Parameter ID	MW 20B											
	Oct-02	Apr-03	Oct-03	Apr-04	Oct-04	Apr-05	Oct-05	Apr-06	Oct-06	Apr-07	Oct-07	May-08
Field Measurements												
Field pH	7.65	7.63	7.75	7.81	7.49	7.33	7.23	7.33	7.47	7.56	7.55	7.631
Field EC	-	-	-	-	-	4.41	10.55 (EF)	4.51	4.29	10.49	10.94	4.570
Field Temperature	-	-	-	-	-	10.4	7.5	5.80	8.90	6.0	11.60	6.8
Routine Water												
pH	7.81	7.84	7.99	8.2	8.2	8.1	8.2	8.1	8.2	8.1	8.0	8.2
Conductivity (EC)	4220	4150	4010	4270	4320	4160	3910	4290	4370	4700	4480	4660
Calcium	94.6	102	89.9	79.5	43.8	100	81.6	105	104	130	109	138
Magnesium	31.4	34.7	27.6	34.4	32.3	31.5	35	33.2	9.4	46.5	37.2	50.6
Sodium	1110	959	943	1010	1000	978	1060	975	995	1050	1040	1030
Potassium	9.2	7.6	7.6	6.9	9.3	7.6	9.5	8.4	9.4	10.2	9.6	7.4
Iron	<0.05	<0.05	<0.1	0.183	<0.005	0.007	<0.005	<0.005	<0.005	<0.005	0.013	<0.005
Sulphate	1820	1710	1670	1630	1610	1560	1610	1580	1600	1790	1710	1890
Chloride	<0.5	0.8	<0.5	1	2	2	3	2	2	2	2	4
Bicarbonate	1080	1070	1040	1030	1060	1060	1070	1060	1030	962	1050	986
Carbonate	<6	<6	<6	<5	<5	<5	<5	<5	<5	<5	<5	<5
Hydroxide	-	-	-	-	-	-	-	-	-	-	-	-
Nitrate (N)	<0.04	<0.02	<0.02	0.1	0.2	<0.1	<0.1	0.2	0.2	0.6	0.1	0.4
Nitrite (N)	-	-	-	-	-	-	-	-	-	-	-	-
Nitrate and Nitrate (N)	-	-	-	-	-	-	-	-	-	-	-	-
Total Dissolved Solids (TDS)	3590	3340	3250	3270	3220	3200	3320	3230	3250	3500	3420	3610
Hardness	-	-	-	-	-	-	-	-	-	-	-	-
Alkalinity (total as CaCO3)	-	-	-	-	-	-	-	-	-	-	-	-
Alkalinity (pp as CaCO3)	-	-	-	-	-	-	-	-	-	-	-	-
Ionic Balance	-	-	-	-	-	-	-	-	-	-	-	-
Water Nutrients												
Ammonia-N	< 0.05	< 0.05	0.06	< 0.05	0.08	<0.05	0.12	0.10	0.11	<0.05	0.06	<0.05
TKN	2.22	1.7	0.85	< 0.2	< 0.2	<0.2	1.5	1.5	0.4	0.4	0.8	0.5
Hydrocarbons												
Benzene	-	-	-	-	-	-	-	-	-	-	-	<0.00050
Toluene	-	-	-	-	-	-	-	-	-	-	-	<0.00050
Ethylbenzene	-	-	-	-	-	-	-	-	-	-	-	<0.00050
Xylene	-	-	-	-	-	-	-	-	-	-	-	<0.00050
F1 (C6-C10)	-	-	-	-	-	-	-	-	-	-	-	<0.1
F2 (>C10-C16)	-	-	-	-	-	-	-	-	-	-	-	<0.05
Organics												
COD	119	138	32	< 10	< 10	16	17	14	14	24	11	13
TOC	5.2	5.2	5	4	5	5	5	5	6	6	6	-
DOC	-	-	-	-	-	-	-	-	-	-	-	6
Oil & Grease	10	<5	6	<1	<1	<1	<1	<1	1	1	1	-
Metals												
Aluminum	-	-	-	-	-	-	-	-	-	-	-	-
Antimony	<0.001	<0.001	<0.002	0.0007	0.0026	0.0009	<0.0004	0.0006	0.0006	<0.0004	0.0007	-
Arsenic	-	-	-	-	-	-	-	-	-	-	-	-
Barium	0.025	0.021	0.024	0.024	0.025	0.021	0.028	0.022	0.016	0.017	0.018	0.021
Beryllium	-	-	-	-	-	-	-	-	-	-	-	-
Boron	-	-	-	-	-	-	-	-	-	-	-	-
Cadmium	<0.00005	<0.00005	<0.0001	*<0.001*	*<0.001*	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	*<0.001*
Chromium	0.0046	0.0053	<0.005	<0.005	<0.005	<0.005	0.011	<0.005	<0.005	<0.005	<0.005	<0.005
Cobalt	<0.0005	0.0006	<0.001	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Copper	<0.005	<0.005	*<0.01*	0.012	0.014	0.011	0.005	0.005	0.003	0.003	0.003	0.004
Lead	<0.0005	<0.0005	<0.001	<0.005	<0.005	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0002	<0.005
Lithium	-	-	-	-	-	-	-	-	-	-	-	-
Manganese	-	-	-	-	-	-	-	-	-	-	-	-
Mercury	*<0.0001*	*<0.0001*	*<0.0001*	*<0.0002*	*<0.0002*	*<0.0001*	*<0.0001*	*<0.0001*	*<0.0001*	*<0.0001*	*<0.0001*	*<0.0001*
Molybdenum	<0.005	<0.005	<0.01	<0.0002	<0.0002	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Nickel	<0.003	<0.0025	<0.005	<0.002	<0.002	<0.002	<0.002	<0.002	0.003	<0.002	0.004	0.003
Phosphorus	-	-	-	-	-	-	-	-	-	-	-	-
Selenium	-	-	-	-	-	-	-	-	-	-	-	-
Silicon	-	-	-	-	-	-	-	-	-	-	-	-
Silver	-	-	-	-	-	-	-	-	-	-	-	-
Strontium	-	-	-	-	-	-	-	-	-	-	-	-
Sulphur	-	-	-	-	-	-	-	-	-	-	-	-
Thallium	-	-	-	-	-	-	-	-	-	-	-	-
Tin	-	-	-	-	-	-	-	-	-	-	-	-
Titanium	-	-	-	-	-	-	-	-	-	-	-	-
Uranium	-	-	-	-	-	-	-	-	-	-	-	-
Vanadium	-	-	-	-	-	-	-	-	-	-	-	-
Zinc	0.007	<0.005	<0.01	0.021	0.016	0.011	0.006	0.006	<0.002	0.006	0.004	0.004

Parameter ID	MW 20B											
	May-09	Jun-10	Jun-11	May-12	Jun-13	May-14	May-15	Jun-16	Jun-17	Jun-18	Jun-19	Jun-20
Field Measurements												
Field pH	7.487	8.9	7.54	7.41	5.32	7.9	7.9	7.64	7.6	7.3	7.51	7.56
Field EC	4.400	2.7	4.59	1.97	5.35	5.32	5.03	4.97	5.18	5.3	4.81	5.86
Field Temperature	8.7	12	10.1	6.9	7.1	7.9	5.5	7.3	6.2	5	8.5	5.6
Routine Water												
pH	8.13	8.22	8.13	8.14	8.19	8.02	8.04	8.04	8.17	8.1	8.10	7.90
Conductivity (EC)	4450	4620	4700	4600	4600	4900	4700	4700	5000	4800	4700	5700
Calcium	108	116	100	110	110	130	120	110	140	120	120	200
Magnesium	35.3	39.6	36	34	39	47	39	37	50	42	36	65
Sodium	1070	936	1000	1100	960	1000	1000	1000	1100	1100	1100	1300
Potassium	10.3	9.17	8	9.2	8.7	9.4	9.0	9.0	9.8	9.3	8.7	10
Iron	0.0216	0.018	<0.06	<0.060	<0.060	0.24	<0.060	<0.60	<0.60	<0.06	<0.060	0.1
Sulphate	1680	1780 *	1800	1800	1900	2200	1900	1800	1900	1800	1600	2600
Chloride	0.82	<10 *	2	1.6	1.6	1.3	1.5	1.4	1.1	<1.0	1.2	2.2
Bicarbonate	1060	976	990	1000	960	950	990	1100	960	1000	1000	870
Carbonate	<5.0	<5.0	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<1.0	<1.0	<1.0
Hydroxide	-	-	-	-	-	-	<0.50	<0.50	<0.5	<1.0	<1.0	<1.0
Nitrate (N)	0.102	<1.0 *	0.11	0.052	0.28	0.27	0.17	0.14	0.86	0.079	0.14	0.33
Nitrite (N)	-	-	-	-	-	-	<0.010	<0.010	<0.033	<0.010	0.011	<0.010
Nitrate and Nitrate (N)	-	-	-	-	-	-	0.17	0.14	-	0.079	0.15	0.33
Total Dissolved Solids (TDS)	3430	3360	3400	3600	3500	3800	3600	3500	3700	3500	3300	4600
Hardness	-	-	-	-	-	-	450	430	570	480	440	770
Alkalinity (total as CaCO3)	-	-	-	-	-	-	810	880	790	820	850	710
Alkalinity (pp as CaCO3)	-	-	-	-	-	-	<0.50	<0.50	<0.5	-	<1.0	
Ionic Balance	-	-	-	-	-	-	0.98	0.96	4.5	1.2	5.6	1.6
Water Nutrients												
Ammonia-N	<0.050	<0.050	<0.05	0.13	<0.05	0.058	<0.050	<0.050	0.035	<0.015	0.051	0.035
TKN	0.57	1.57	0.32	1.3	2.9	3	3.7	0.29	0.74	0.32	0.61	1
Hydrocarbons												
Benzene	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene	<0.00050	<0.0010	<0.0008	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00089	<0.00089	<0.00089
F1 (C6-C10)	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	<0.050	<0.25	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Organics												
COD	10.6	9.4	58	91	63	96	120	15	81	32	32	27
TOC	-	-	-	-	-	-	-	-	-	-	-	
DOC	4.7	6	6.9	5.9	5.6	7.2	6.4	4.3	6	6	5.8	12
Oil & Grease	-	-	-	-	-	-	-	-	-	-	-	
Metals												
Aluminum	-	-	-	-	-	-	0.0035	<0.0030	0.0041	<0.003	0.013	<0.0030
Antimony	-	<0.00040	<0.0006	<0.0030	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic	-	-	-	-	-	-	0.00032	0.00030	0.00032	0.00027	0.00030	0.00030
Barium	0.0156	0.0223	0.018	0.015	0.017	0.022	0.014	<0.10	<0.10	0.016	0.015	0.014
Beryllium	-	-	-	-	-	-	<0.0010	<0.0010	<0.001	-	<0.0010	
Boron	-	-	-	-	-	-	0.33	0.38	0.35	0.34	0.38	0.26
Cadmium	*<0.0010*	<0.000050	<0.000025	0.000051	0.00018	<0.000025	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
Chromium	<0.0050	<0.0050	0.003	<0.0050	0.0033	0.0036	0.0029	0.0035	0.0011	0.0016	0.0020	0.0012
Cobalt	<0.0020	<0.0020	<0.0003	<0.0015	<0.00030	<0.0003	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	
Copper	0.0046	0.0052	0.0014	0.0025	0.0012	0.002	0.0013	0.00053	0.00059	0.00073	0.00093	0.004
Lead	<0.0050	<0.00010	<0.0002	<0.0010	<0.00020	0.00036	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Lithium	-	-	-	-	-	-	0.47	0.49	-	-	0.47	
Manganese	-	-	-	-	-	-	<0.0040	<0.040	<0.040	<0.004	<0.0040	<0.0040
Mercury	*<0.00010*	*<0.00010*	<0.000005	0.0000032	<0.0000050	<0.0000050	<0.0000050	0.0000026	<0.0000020	<0.0000020	<0.0000020	<0.0000019
Molybdenum	<0.0050	<0.0050	0.0009	<0.0010	0.00096	0.00094	0.00083	0.00076	0.00078	0.00069	0.00071	
Nickel	0.0029	0.0026	0.0013	<0.0025	0.0013	0.0023	0.0011	0.0016	0.00067	0.0015	0.0010	0.0010
Phosphorus	-	-	-	-	-	-	<0.10	<1.0	<1	-	<0.10	
Selenium	-	-	-	-	-	-	0.0031	<0.00020	0.013	0.00073	<0.00020	0.03
Silicon	-	-	-	-	-	-	4.6	4.5	4.7	-	4.4	
Silver	-	-	-	-	-	-	<0.00010	<0.00010	<0.0001	<0.00010	<0.00010	<0.00010
Strontium	-	-	-	-	-	-	1.7	1.6	2.2	-	1.5	
Sulphur	-	-	-	-	-	-	610	580	680	-	660	
Thallium	-	-	-	-	-	-	<0.00020	<0.00020	<0.0002	-	<0.00020	
Tin	-	-	-	-	-	-	<0.0010	<0.0010	<0.001	-	<0.0010	
Titanium	-	-	-	-	-	-	<0.0010	<0.0010	<0.001	-	<0.0010	
Uranium	-	-	-	-	-	-	0.0033	0.0013	0.005	0.0034	0.0017	0.011
Vanadium	-	-	-	-	-	-	<0.0010	<0.0010	<0.001	-	<0.0010	
Zinc	0.0054	<0.0020	0.013	<0.015	0.0037	0.0045	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030

Notes:

¹ Alberta Environment and Parks (AEP). 2019. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. 198 pp. Referenced guidelines are for fine textured soils under Agricultural land use

² Guideline varies with hardness

³ Guideline varies with chloride

⁴ Guideline varies with pH and temperature

⁵ Guideline varies with pH

"-" No applicable guideline or not analyzed

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Italic - Detection limit greater than Tier 1 Guideline

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	Jun-18	Jun-19	Jun-20
Volatile Organic Compounds (VOCs)																																									
Bromodichloromethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Bromoform	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Bromomethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	
Carbon tetrachloride	mg/L	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Chlorobenzene	mg/L	0.0013	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Chloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	
Chloroform	mg/L	0.08	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Chloromethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	
Dibromochloromethane	mg/L	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	<0.0010
1,2-Dibromoethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00020	
1,2-Dichlorobenzene	mg/L	0.0007	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,3-Dichlorobenzene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,4-Dichlorobenzene	mg/L	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,1-Dichloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,2-Dichloroethane	mg/L	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,1-Dichloroethene	mg/L	0.014	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,2-Dichloroethene (cis)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,2-Dichloroethene (trans)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,2-Dichloropropane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,3-Dichloropropene [cis]	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,3-Dichloropropene [trans]	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Methyl t-Butyl Ether (MTBE)	mg/L	0.015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Methylene Chloride	mg/L	0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	<0.0020
Methyl Methacrylate	mg/L	0.47	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Styrene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,1,1,2-Tetrachloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	
1,1,2,2-Tetrachloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	
Tetrachloroethene	mg/L	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,2,3-Trichlorobenzene	mg/L	0.008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	<0.0010
1,2,4-Trichlorobenzene	mg/L	0.015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	<0.0010
1,3,5-Trichlorobenzene	mg/L	0.014	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,1,1-Trichloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,1,2-Trichloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Trichloroethene	mg/L	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Trichlorofluoromethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Trihalomethanes	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0013	<0.0013
1,2,4-Trimethylbenzene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,3,5-Trimethylbenzene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Vinyl chloride	mg/L	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050

Notes:

[1] Alberta Environment and Parks (AEP). 2019. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. 198 pp.
Referenced guidelines are for fine textured soils under Agricultural land use

[2] Guideline varies with hardness
[3] Guideline varies with chloride
[4] Guideline varies with pH and temperature
[5] Guideline varies with pH
"-" No applicable guideline or not analyzed
Equipment Failure, parameter not reported (EF)
Detection limit adjusted (*)
Exceeds Regulatory Limit
Italic - Detection limit greater than Tier 1 Guideline

Table E21A: Field Data and Chemical Analysis Results

Parameter ID	Units	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
Field Measurements																	
Field pH	-	-	7.7	-	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
Field EC	mS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Field Temperature	°C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Routine Water																	
pH	-	6.5-8.5	8.07	-	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
Conductivity (EC)	µS/cm	1000	5630	-	3050	2240	2320	2310	2220	2090	2090	2180	2150	1970	2050	2110	2160
Calcium	mg/L	-	70.2	-	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
Magnesium	mg/L	-	31	-	6.4	1.3	16	5.47	0.72	0.52	0.6	0.82	< 1	< 1	< 1	0.6	0.5
Sodium	mg/L	200	1660	-	802	595	597	536	602	613	565	629	600	590	582	562	552
Potassium	mg/L	-	5.68	-	8.88	2.79	16.4	6.2	2.5	1.7	<2	2.4	<2	<2	<2	0.7	1.7
Iron	mg/L	0.3	0.028	-	86	-	34.2	-	-	0.02	0.024	-	<0.05	0.09	<0.05	1.06	0.021
Sulphate	mg/L	128-429 [2]	2960	-	1490	352	232	156	126	93.5	93.9	96.9	89.9	76.6	83.2	75.4	70.4
Chloride	mg/L	100	21.4	-	23.9	18.9	16.8	14.2	15.6	8.9	7.7	8.5	7.7	8.4	6.9	9	10
Bicarbonate	mg/L	-	1110	-	470	1050	1280	1150	1340	1360	1340	1340	1330	1330	1310	1270	1270
Carbonate	mg/L	-	-	-	65.4	49.7	-	61	< 6	< 6	< 6	< 6	< 6	< 6	< 6	14	19
Hydroxide	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrate (N)	mg/L	3	-	-	18.1	7.26	11.3	11.5	14.7	13.4	17.7	17	17	17.4	19.7	14.9	16.9
Nitrite (N)	mg/L	0.02 - 0.20 [3]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrate and Nitrate (N)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Dissolved Solids (TDS)	mg/L	500	5300	-	2650	1540	1520	1360	1410	1390	1330	1400	1360	1330	1320	1360	1360
Hardness	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Alkalinity (total as CaCO3)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Alkalinity (pp as CaCO3)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ionic Balance	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Water Nutrients																	
Ammonia-N	mg/L	0.018-190 [4]	0.25	-	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
TKN	mg/L	-	0.7	-	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
Hydrocarbons																	
Benzene	mg/L	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Toluene	mg/L	0.024	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	mg/L	0.0016	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Xylene	mg/L	0.02	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F1 (C6-C10)	mg/L	2.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F2 (>C10-C16)	mg/L	1.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Organics																	
COD	mg/L	-	34	-	1190	450	91	105	132	53	158	73	135	72	134	20	<10
TOC	mg/L	-	13.3	-	62.5	85.1	7.5	0.9	1.7	15.7	1.1	8.4	8.3	11.3	17	7	6
DOC	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Oil & Grease	mg/L	-	<1	-	-	1	2	-	10	<5	<5	31	23	<1	6	<1	<1
Metals																	
Aluminum	mg/L	0.0007 / 0.05 [5]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Antimony	mg/L	0.006	<0.005	-	-	-	0.006	-	-	<0.006	<0.02	-	0.0022	0.0014	0.0015	0.0019	0.002
Arsenic	mg/L	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Barium	mg/L	1	0.0181	-	-	-	0.541	-	-	0.0533	0.054	-	0.105	0.058	0.07	0.081	0.073
Beryllium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Boron	mg/L	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cadmium	mg/L	0.00004-0.00037 [2]	<0.0005	-	-	-	0.002	-	-	<0.0006	*<0.003*	-	<0.00001	<0.00005	0.00012	*<0.001*	*<0.001*
Chromium	mg/L	0.05	0.002	-	-	-	0.0287	-	-	<0.0009	<0.004	-	0.0006	0.0031	0.0027	<.005	<0.005
Cobalt	mg/L	-	<0.0007	-	-	-	0.0128	-	-	0.0031	0.0045	-	0.0013	<0.0005	0.0003	<0.002	<0.002
Copper	mg/L	0.007	<0.001	-	-	-	0.059	-	-	0.004	0.006	-	0.011	0.023	0.003	0.004	0.005
Lead	mg/L	0.001-0.007 [2]	<0.002	-	-	-	0.019	-	-	<0.002	*<0.01*	-	0.0026	<0.0005	0.0001	< 0.005	<0.005
Lithium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Manganese	mg/L	0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mercury	mg/L	0.000005	*<0.0001*	-	*<0.0001*	-	*< 0.0001*	-	-	*<0.0001*	*<0.0001*	-	-	*<0.0001*	*<0.0001*	*<0.0002*	*<0.0002*
Molybdenum	mg/L	-	<0.001	-	-	-	0.035	-	-	0.018	0.02	-	0.023	0.017	0.018	0.016	0.014
Nickel	mg/L	0.007-0.170 [2]	0.002	-	-	-	0.038	-	-	0.002	0.005	-	0.0092	<0.0025	0.0026	0.003	0.003
Phosphorus	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Selenium	mg/L	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silicon	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silver	mg/L	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Strontium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sulphur	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Thallium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tin	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Titanium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Uranium	mg/L	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vanadium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Zinc	mg/L	0.03	0.0144	-	-	-	0.146	-	-	0.0299	0.023	-	0.061	0.012	0.007	0.015	0.007

Parameter ID	MW 21A												MW 21A						
	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	Jun-18	Jun-19	Jun-20
Field Measurements																			
Field pH	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	7.9	7.93	7.88
Field EC	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	2.24	2.14	1.994
Field Temperature	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	7.8	13.6	7.7
Routine Water																			
pH	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	8.35	8.51	8.41
Conductivity (EC)	2030	2110	2070	2100	2450	2110	2030	2070	2060	2100	2100	2000	2000	2000	2000	2000	2000	2100	2000
Calcium	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	4.3	4.3	4.6
Magnesium	<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	0.4	0.42	0.47
Sodium	536	547	553	534	630	581	527	496	514	440	540	460	470	490	490	480	530	470	540
Potassium	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	1.7	1.6	1.7
Iron	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	<0.060	0.13	<0.060
Sulphate	54.5	77.4	79.9	68.5	258	75.9	59.5	62.1	83.1	81	91	82	90	72	71	65	63	66	68
Chloride	11	15	10	10	16	11	15	8.35	7.95	9	8.9	8.4	9.3	9.4	8.7	11	11	11	10
Bicarbonate	1320	1260	1300	1210	1240	1350	1340	1310	1220	1300	1200	1300	1300	1300	1300	1300	1300	1200	1200
Carbonate	10	25	<5	31	43	<5	13	17.3	31.7	<0.5	38	8.5	<0.50	<0.50	<0.50	11	8	47	11
Hydroxide	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.50	<0.50	<0.5	<1.0	<1.0	<1.0
Nitrate (N)	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	0.62	0.98	1.4
Nitrite (N)	-	-	-	-	-	-	-	-	-	-	-	-	-	0.012	0.023	0.064	<0.010	<0.010	<0.010
Nitrate and Nitrate (N)	-	-	-	-	-	-	-	-	-	-	-	-	-	1.2	1.3	0.96	0.62	0.98	1.4
Total Dissolved Solids (TDS)	1300	1350	1360	1310	1570	1470	1330	1260	1280	1200	1300	1200	1200	1200	1200	1200	1300	1200	1200
Hardness	-	-	-	-	-	-	-	-	-	-	-	-	-	13	14	12	12	12	13
Alkalinity (total as CaCO3)	-	-	-	-	-	-	-	-	-	-	-	-	-	1100	1100	1100	1100	1100	1000
Alkalinity (pp as CaCO3)	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.50	<0.50	9.4	-	39	
Ionic Balance	-	-	-	-	-	-	-	-	-	-	-	-	-	0.92	0.93	4.4	0.25	5.0	4.1
Water Nutrients																			
Ammonia-N	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	0.039	0.097	0.063
TKN	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	0.92	0.73	0.47
Hydrocarbons																			
Benzene	-	-	-	-	-	-	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	-	-	-	-	-	-	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	0.00074	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	-	-	-	-	-	-	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene	-	-	-	-	-	-	<0.00050	<0.00050	<0.0010	<0.0008	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00089	<0.00089	<0.00089
F1 (C6-C10)	-	-	-	-	-	-	<0.1	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	-	-	-	-	-	-	<0.05	0.156	<0.48 *	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Organics																			
COD	27	24	19	22	42	21	19	24.8	18.7	29	41	110	96	74	28	43	49	39	32
TOC	10	9	7	8	15	10	-	-	-	-	-	-	-	-	-	-	-	-	
DOC	-	-	-	-	-	-	8	7.7	8.6	9.5	9.8	10	7	8.4	7.1	9.2	9.1	10	8.5
Oil & Grease	<1	<1	<1	1	<1	1	-	-	-	-	-	-	-	-	-	-	-	-	
Metals																			
Aluminum	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0058	0.0047	0.0043	<0.003	0.058	0.0038
Antimony	0.0022	0.0011	0.0020	0.0016	0.0007	0.0014	-	-	0.00082	<0.0006	<0.00060	0.0011	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	0.00065	<0.00060
Arsenic	-	-	-	-	-	-	-	-	-	-	-	-	-	0.00093	0.0010	0.0011	0.0012	0.0011	0.00078
Barium	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	0.081	0.090	0.070
Beryllium	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	<0.0010	<0.001	-	<0.0010	
Boron	-	-	-	-	-	-	-	-	-	-	-	-	-	0.83	0.93	0.82	0.9	0.85	0.89
Cadmium	<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	0.00012	0.00014	0.00027
Chromium	<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	<0.0010	<0.0010	<0.0010
Cobalt	<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	<0.00030	<0.00030	
Copper	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	0.0021	0.0050	0.0020
Lead	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	<0.00020	0.00041	<0.00020
Lithium	-	-	-	-	-	-	-	-	-	-	-	-	-	0.10	0.12	-	-	0.10	
Manganese	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0040	<0.0040	0.0047	0.0048	0.014	0.0073
Mercury	*<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	-	<0.0000020	<0.0000019
Molybdenum	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	0.0059	0.0052	
Nickel	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	0.0031	0.0027	0.0027
Phosphorus	-	-	-	-	-	-	-	-	-	-	-	-	-	0.10	<0.10	<0.1	-	<0.10	
Selenium	-	-	-	-	-	-	-	-	-	-	-	-	-	0.00022	<0.00020	0.0002	0.00025	<0.00020	0.00023
Silicon	-	-	-	-	-	-	-	-	-	-	-	-	-	2.7	2.8	2.7	-	3.0	
Silver	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00010	<0.00010	<0.0001	<0.00010	<0.00010	<0.00010
Strontium	-	-	-	-	-	-	-	-	-	-	-	-	-	0.11	0.11	0.11	-	0.11	
Sulphur	-	-	-	-	-	-	-	-	-	-	-	-	-	22	23	19	-	20	
Thallium	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00020	<0.00020	<0.0002	-	<0.00020	
Tin	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	<0.0010	<0.001	-	<0.0010	
Titanium	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	<0.0010	<0.001	-	<0.0010	
Uranium	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0034	0.0033	0.0036	0.0035	0.0033	0.0036
Vanadium	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	<0.0010	<0.001	-	<0.0010	
Zinc	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	<0.0030	0.010	<0.0030

Notes:

[1] Alberta Environment and Parks (AEP). 2019. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. 198 pp. Referenced guidelines are for fine textured soils under Agricultural land use

[2] Guideline varies with hardness
[3] Guideline varies with chloride
[4] Guideline varies with pH and temperature
[5] Guideline varies with pH
"-" No applicable guideline or not analyzed
Equipment Failure, parameter not reported (EF)
Detection limit adjusted (*)
Exceeds Regulatory Limit
Italic - Detection limit greater than Tier 1 Guideline

Table E21A: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 21A																												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	Jun-18	Jun-19	Jun-20
Volatile Organic Compounds (VOCs)																																					
Bromodichloromethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Bromoform	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Bromomethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	
Carbon tetrachloride	mg/L	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Chlorobenzene	mg/L	0.0013	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Chloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	
Chloroform	mg/L	0.08	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Chloromethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	
Dibromochloromethane	mg/L	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	<0.0010
1,2-Dibromoethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00020	
1,2-Dichlorobenzene	mg/L	0.0007	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,3-Dichlorobenzene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,4-Dichlorobenzene	mg/L	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,1-Dichloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,2-Dichloroethane	mg/L	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,1-Dichloroethene	mg/L	0.014	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,2-Dichloroethene (cis)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,2-Dichloroethene (trans)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,2-Dichloropropane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,3-Dichloropropene [cis]	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,3-Dichloropropene [trans]	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Methyl t-Butyl Ether (MTBE)	mg/L	0.015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Methylene Chloride	mg/L	0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	<0.0020
Methyl Methacrylate	mg/L	0.47	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Styrene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,1,1,2-Tetrachloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	
1,1,2,2-Tetrachloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	
Tetrachloroethene	mg/L	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,2,3-Trichlorobenzene	mg/L	0.008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	<0.0010
1,2,4-Trichlorobenzene	mg/L	0.015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	<0.0010
1,3,5-Trichlorobenzene	mg/L	0.014	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,1,1-Trichloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,1,2-Trichloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Trichloroethene	mg/L	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Trichlorofluoromethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Trihalomethanes	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0013	<0.0013
1,2,4-Trimethylbenzene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,3,5-Trimethylbenzene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Vinyl chloride	mg/L	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050

Notes:

[1] Alberta Environment and Parks (AEP). 2019. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. 198 pp. Referenced guidelines are for fine textured soils under Agricultural land use

[2] Guideline varies with hardness

[3] Guideline varies with chloride

[4] Guideline varies with pH and temperature

[5] Guideline varies with pH

"-" No applicable guideline or not analyzed

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

#alic - Detection limit greater than Tier 1 Guideline

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	Jun-18	Jun-19	Jun-20
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	-	7.86	7.67
Field EC	mS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	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	-	2.87	3.01
Field Temperature	°C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10.8	8.9	6.5	9.3	4.6	10.87	5.2	6.2	15.7	12.3	6.9	-	6.6	6.9	6.5	6.5	-	7.3	6.1
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	8.29	8.44	8.36
Conductivity (EC)	µS/cm	1000	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	2900	2900	2900
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	19	20	22
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	6.1	5.9	6.8
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	680	670	730
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	4.2	4.0	4.3
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	<0.06	0.084	<0.060
Sulphate	mg/L	128-429 [2]	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	650	660	720
Chloride	mg/L	100	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	1.3	1.7	2
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	1100	970	940
Carbonate	mg/L	-	-	-	-	<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	<1.0	26	9.4
Hydroxide	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.50	<0.50	<0.5	<1.0	<1.0	<1.0
Nitrate (N)	mg/L	3	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	0.1	0.12	0.096
Nitrite (N)	mg/L	0.02 - 0.20 [3]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.010	<0.010	<0.033	<0.010	<0.010	<0.010
Nitrate and Nitrate (N)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.11	0.11	-	0.1	0.12	0.096
Total Dissolved Solids (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	1900	1900	1900
Hardness	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	61	61	64	72	74	83
Alkalinity (total as CaCO3)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	860	850	860	870	840	780
Alkalinity (pp as CaCO3)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.50	<0.50	7.6	-	21	
Ionic Balance	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.99	1.0	0.56	0.26	0.046	4.3
Water Nutrients																																		
Ammonia-N	mg/L	0.018-190 [4]	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	<0.015	0.034	<0.015
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	0.31	0.32	0.32
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	<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	<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	<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	<0.00089	<0.00089	<0.00089
F1 (C6-C10)	mg/L	2.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	1.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	<0.050	<0.25	<0.1	<0.10	<0.10	<0.10	<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	27	30	23
TOC	mg/L	-	6.3	7.1	6.2	5.9	7	6.1	5.8	5.8	5.3	7.1	5.1	5	5	5	5	6	6	5	7	-	-	-	-	-	-	-	-	-	-	-	-	
DOC	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	4.4	5.2	4.6	5.5	4.7	3.8	4.2	4.4	6.1	6.5	5.9	6.2
Oil & Grease	mg/L	-	< 1	1	< 1	< 1	3	6	< 5	< 5	9	< 5	6	< 1	< 1	<1	<1	<1	<1	<1	<1	-	-	-	-	-	-	-	-	-	-	-	-	
Metals																																		
Aluminum	mg/L	0.0007 / 0.05 [5]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0042	<0.0030	0.0035	<0.003	0.028	0.003
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	-	-	<0.00040	<0.006	<0.0030	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic	mg/L	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.00053	0.00064	0.00064	0.00066	0.00057	0.00048
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	<0.01	<0.010	<0.010
Beryllium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	<0.0010	<0.001	-	<0.0010	
Boron	mg/L	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.22	0.25	0.23	0.23	0.22	0.23
Cadmium	mg/L	0.00004-0.00037 [2]	<0.0005	<0.0005	<0.0005	<0.0006	<0.0006	*<0.005*	*<0.003*	*<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	<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	<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	<0.00030	<0.00030	
Copper	mg/L	0.007	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	0.00072	0.0015	0.00095
Lead	mg/L	0.001-0.007 [2]	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	<0.00020	<0.00020	<0.00020
Lithium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.22	0.24	-	-	0.25	
Manganese	mg/L	0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.004	<0.0040	0.0041	<0.004	0.0079	<0.0040
Mercury	mg/L	0.000005	*<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*	*<0.00010*	*<0.00010*	<0.000005	*<0.0020*	<0.0000050	<0.0000050	<0.0000050	<0.0000020	<0.0000020	<0.0000020	<0.0000020	<0.0000019
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	0.0015	0.0014	
Nickel	mg/L	0.007-0.170 [2]	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	0.0012	0.0022	0.0022
Phosphorus	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.10	<0.10	<0.1	-	<0.10	
Selenium	mg/L	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00020	<0.00020	<0.00020	<0.0002	<0.00020	<0.00020
Silicon	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3.8	3.9	3.9	-	4.0	
Silver	mg/L	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00010	<0.00010	<0.0001	<0.00010	<0.00010	<0.00010
Strontium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.27	0.26	0.3	-	0.33	
Sulphur	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	170	180	190	-	220	
Thallium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00020	<0.00020	<0.0002	-	<0.00020	
Tin	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	<0.0010	<0.001	-	<0.0010	
Titanium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	<0.0010	<0.001	-	<0.0010	
Uranium	mg/L	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0016	0.0017	0.0017	0.0019	0.0019	0.0019
Vanadium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	<0.0010	<0.001	-	<0.0010	
Zinc	mg/L	0.03	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	<0.0030	<0.0030	<0.0030

Notes:

[1] Alberta Environment and Parks (AEP). 2019. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. 198 pp. Referenced guidelines are for fine textured soils under Agricultural land use

[2] Guideline varies with hardness

[3] Guideline varies with chloride

[4] Guideline varies with pH and temperature

[5] Guideline varies with pH

"-" No applicable guideline or not analyzed

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Italic - Detection limit greater than Tier 1 Guideline

TETRA TECH

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			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	Jun-18	Jun-19	Jun-20
Volatile Organic Compounds (VOCs)																																		
Bromodichloromethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Bromoform	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Bromomethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	
Carbon tetrachloride	mg/L	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Chlorobenzene	mg/L	0.0013	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Chloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	
Chloroform	mg/L	0.08	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Chloromethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	
Dibromochloromethane	mg/L	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	<0.0010
1,2-Dibromoethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00020	
1,2-Dichlorobenzene	mg/L	0.0007	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,3-Dichlorobenzene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,4-Dichlorobenzene	mg/L	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,1-Dichloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,2-Dichloroethane	mg/L	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,1-Dichloroethene	mg/L	0.014	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,2-Dichloroethene (cis)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,2-Dichloroethene (trans)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,2-Dichloropropane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,3-Dichloropropene [cis]	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,3-Dichloropropene [trans]	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Methyl t-Butyl Ether (MTBE)	mg/L	0.015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Methylene Chloride	mg/L	0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	<0.0020
Methyl Methacrylate	mg/L	0.47	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Styrene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,1,1,2-Tetrachloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	
1,1,2,2-Tetrachloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	
Tetrachloroethene	mg/L	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,2,3-Trichlorobenzene	mg/L	0.008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	<0.0010
1,2,4-Trichlorobenzene	mg/L	0.015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	<0.0010
1,3,5-Trichlorobenzene	mg/L	0.014	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,1,1-Trichloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,1,2-Trichloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Trichloroethene	mg/L	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Trichlorofluoromethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Trihalomethanes	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0013	<0.0013
1,2,4-Trimethylbenzene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,3,5-Trimethylbenzene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Vinyl chloride	mg/L	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050

Notes:
[1] Alberta Environment and Parks (AEP). 2019. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. 198 pp. Referenced guidelines are for fine textured soils under Agricultural land use
[2] Guideline varies with hardness
[3] Guideline varies with chloride
[4] Guideline varies with pH and temperature
[5] Guideline varies with pH
"-" No applicable guideline or not analyzed
Equipment Failure, parameter not reported (EF)
Detection limit adjusted (*)
Exceeds Regulatory Limit
Italic - Detection limit greater than Tier 1 Guideline

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	Jun-18	Jun-19	Jun-20
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	-	7.76	7.6	7.74	7.82	7.51
Field EC	mS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	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	-	5.60	5.29	5.71	5.532	5.36
Field Temperature	°C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	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	-	10.0	9	7.2	10.0	9.1
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	8.08	8.33	8.24
Conductivity (EC)	µS/cm	1000	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	5300	5300	5300
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	36	35	40
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	3.3	4.0	4.0
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	1300	1300	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	4.3	4.2	4.4
Iron	mg/L	0.3	62.6	-	0.004	-	0.022	-	<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	<0.6	<0.60	
Sulphate	mg/L	128-429 [2]	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	1900	1800	1900
Chloride	mg/L	100	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	13	12	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	940	920	890
Carbonate	mg/L	-	74.1	-	-	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	<1.0	8.9	<1.0
Hydroxide	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.50	<0.50	<0.5	<1.0	<1.0	<1.0
Nitrate (N)	mg/L	3	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	14	18	17
Nitrite (N)	mg/L	0.02 - 0.20 [3]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.011	<0.010	<0.033	<0.010	0.019	0.033
Nitrate and Nitrate (N)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	16	17	-	14	18	17
Total Dissolved Solids (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	3800	3700	3800
Hardness	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100	100	110	100	100	120
Alkalinity (total as CaCO3)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	790	790	780	770	770	730
Alkalinity (pp as CaCO3)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.50	<0.50	2	-	7.4	
Ionic Balance	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.93	0.93	1.2	1.1	2.2	3.5
Water Nutrients																																		
Ammonia-N	mg/L	0.018-190 [4]	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	0.049	0.074	0.24
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	0.88	0.9	0.63
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	<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	<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	<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	<0.00089	<0.00089	<0.00089
F1 (C6-C10)	mg/L	2.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	1.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	<0.050	<0.25	<0.1	<0.75	<0.10	<0.10	<0.10	<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	67	43	33
TOC	mg/L	-	13.9	10.5	18	6.2	6	7.2	5.7	5.9	5.8	7.3	10.4	5	4	5	6	6	4	5	6	-	-	-	-	-	-	-	-	-	-	-	-	
DOC	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6	5.6	6.2	8.3	6.2	7.4	5.1	7.0	5.4	6.7	6.8	6.4	6.1
Oil & Grease	mg/L	-	-	<1	1	2	2	<5	<5	10	-	<1	<5	<1	1	<1	<1	<1	<1	<1	1	-	-	-	-	-	-	-	-	-	-	-	-	
Metals																																		
Aluminum	mg/L	0.0007 / 0.05 [5]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.030	0.0047	0.0058	<0.003	0.004	<0.0030
Antimony	mg/L	0.006	-	-	0.006	-	<0.006	-	-	<0.005	0.001	< 0.001	0.0008	0.0012	0.0014	0.0004	0.0007	0.0010	0.0010	0.0008	-	-	0.00046	<0.006	<0.0060	0.00091	<0.00060	<0.0060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.000600
Arsenic	mg/L	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	0.00033	0.0003	0.00028	<0.00020	0.00029
Barium	mg/L	1	-	-	0.0173	-	0.0136	-	-	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	<0.10	<0.10	<0.010
Beryllium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.010	<0.0010	<0.001	-	<0.0010	
Boron	mg/L	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.82	0.85	0.9	0.84	0.88	0.86
Cadmium	mg/L	0.00004-0.00037 [2]	-	-	<0.0005	-	<0.0006	-	-	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	0.000047	0.00017	0.00034
Chromium	mg/L	0.05	-	-	<0.0008	-	<0.0009	-	-	<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	<0.0010	0.0014	<0.0010
Cobalt	mg/L	-	-	-	0.0029	-	0.0039	-	-	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	<0.00030	<0.00030	
Copper	mg/L	0.007	-	-	0.006	-	0.003	-	-	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	0.0012	0.0020	0.0009
Lead	mg/L	0.001-0.007 [2]	-	-	<0.002	-	<0.002	-	-	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	<0.00020	<0.00020	<0.00020
Lithium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.29	0.32	-	-	0.31	
Manganese	mg/L	0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.018	<0.040	<0.040	<0.04	<0.040	0.035
Mercury	mg/L	0.000005	<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	<0.0020	<0.000010	<0.0000050	<0.0000050	<0.0000020	<0.0000020	-	<0.0000020	<0.0000019
Molybdenum	mg/L	-	-	-	0.023	-	0.015	-	-	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	0.0055	0.0051	
Nickel	mg/L	0.007-0.170 [2]	-	-	0.011	-	0.007	-	-	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	0.0022	0.0034	0.0032
Phosphorus	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.10	<1.0	<1	-	<1.0	
Selenium	mg/L	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	<0.00020	<0.00020	<0.00020	<0.00020	0.00026
Silicon	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.9	2.8	2.9	-	2.7	
Silver	mg/L	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	<0.00010	<0.0001	<0.00010	<0.00010	<0.00010
Strontium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.85	0.85	0.94	-	0.95	
Sulphur	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	640	630	650	-	630	
Thallium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	<0.00020	<0.0002	-	<0.00020	
Tin	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.010	<0.0010	<0.001	-	<0.0010	
Titanium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.010	<0.0010	<0.001	-	<0.0010	
Uranium	mg/L	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.004	0.0042	0.0041	0.0041	0.0041	0.0044
Vanadium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.010	<0.0010	<0.001	-	<0.0010	
Zinc	mg/L	0.03	-	-	0.0201	-	0.0298	-	-	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	<0.0030	<0.0030	0.0032

Notes:
[1] Alberta Environment and Parks (AEP). 2019. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. 198 pp. Referenced guidelines are for fine textured soils under Agricultural land use
[2] Guideline varies with hardness
[3] Guideline varies with chloride
[4] Guideline varies with pH and temperature
[5] Guideline varies with pH
"-" No applicable guideline or not analyzed
Equipment Failure, parameter not reported (EF)
Detection limit adjusted (*)
Exceeds Regulatory Limit
/italic - Detection limit greater than Tier 1 Guideline

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	Jun-18	Jun-19	Jun-20
Volatile Organic Compounds (VOCs)																																		
Bromodichloromethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Bromoform	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Bromomethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	
Carbon tetrachloride	mg/L	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Chlorobenzene	mg/L	0.0013	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Chloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	
Chloroform	mg/L	0.08	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Chloromethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	
Dibromochloromethane	mg/L	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	<0.0010
1,2-Dibromoethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00020	
1,2-Dichlorobenzene	mg/L	0.0007	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,3-Dichlorobenzene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,4-Dichlorobenzene	mg/L	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,1-Dichloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,2-Dichloroethane	mg/L	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,1-Dichloroethene	mg/L	0.014	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,2-Dichloroethene (cis)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,2-Dichloroethene (trans)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,2-Dichloropropane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,3-Dichloropropene [cis]	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,3-Dichloropropene [trans]	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Methyl t-Butyl Ether (MTBE)	mg/L	0.015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Methylene Chloride	mg/L	0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	<0.0020
Methyl Methacrylate	mg/L	0.47	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Styrene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,1,1,2-Tetrachloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	
1,1,2,2-Tetrachloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	
Tetrachloroethene	mg/L	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,2,3-Trichlorobenzene	mg/L	0.008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	<0.0010
1,2,4-Trichlorobenzene	mg/L	0.015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	<0.0010
1,3,5-Trichlorobenzene	mg/L	0.014	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,1,1-Trichloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,1,2-Trichloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Trichloroethene	mg/L	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Trichlorofluoromethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Trihalomethanes	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0013	<0.0013
1,2,4-Trimethylbenzene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,3,5-Trimethylbenzene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Vinyl chloride	mg/L	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050

Notes:

[1] Alberta Environment and Parks (AEP). 2019. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. 198 pp. Referenced guidelines are for fine textured soils under Agricultural land use

[2] Guideline varies with hardness

[3] Guideline varies with chloride

[4] Guideline varies with pH and temperature

[5] Guideline varies with pH

"-" No applicable guideline or not analyzed

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

italic - Detection limit greater than Tier 1 Guideline

Table E22B: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 22B																										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	Jun-18	Jun-19	Jun-20
Field Measurements																																			
Field pH	-	-	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	-	7.44	7.56	7.569	7.300	7.84	7.71	7.35	5.5	7.7	7.8	7.57	7.5	7.03	7.60	7.54
Field EC	mS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7.96	18.78 (EF)	8.07	7.26	-	17.20	19.83	7.270	>3.999	3.1	8.11	3.5	8.25	8.56	8.25	8.78	7.87	8.75	8.04	8.18
Field Temperature	°C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9.6	8.5	6.9	7.2	-	4.8	10.08	14.9	11.5	11.6	9.6	6.8	10.3	6.4	8.4	9.7	7.8	6.7	10.3	7.9
Routine Water																																			
pH	-	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	7.98	8.27	8.11
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	8000	8000	8100
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	110	110	120
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	53	51	57
Sodium	mg/L	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	1900	2000	2100
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	9.4	9.3	9.4
Iron	mg/L	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	<0.6	*<0.60*	*<0.60*
Sulphate	mg/L	128-429 [2]	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	3600	3300	3600
Chloride	mg/L	100	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	1.7	2.7	2.7
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	1200	1200	1200
Carbonate	mg/L	-	-	-	-	<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	<1.0	<1.0	<1.0
Hydroxide	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.50	<0.50	<0.5	<1.0	<1.0	<1.0
Nitrate (N)	mg/L	3	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	0.039	0.094	0.096
Nitrite (N)	mg/L	0.02 - 0.20 [3]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.010	<0.010	<0.16	<0.010	<0.010	<0.010
Nitrate and Nitrate (N)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.16	<0.020	-	0.039	0.094	0.096
Total Dissolved Solids (TDS)	mg/L	500	7030	6710	7620	7030	7430	6690	6700	7680	8150	6870	6470	6510	6550	4160	6460	6710	8270	6840	6220	6700	6270	6430	6220	6600	6700	6600	6800	6600	6600	6000	6300	6100	6400
Hardness	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	520	510	490	480	480	530
Alkalinity (total as CaCO3)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1000	1000	1000	1000	1000	960
Alkalinity (pp as CaCO3)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.50	<0.50	<0.5	-	<1.0	
Ionic Balance	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.92	0.95	4	0.19	3.8	3.2
Water Nutrients																																			
Ammonia-N	mg/L	0.018-190 [4]	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	-	<0.05	<0.05	<0.05	<0.050	<0.050	<0.05	<0.050	<0.05	<0.050	<0.050	<0.050	0.04	<0.015	0.031	0.021
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	-	0.5	0.3	0.4	0.58	0.88	0.51	0.36	0.46	0.36	0.52	0.27	0.32	0.26	0.49	0.38
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	<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	<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	<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	<0.00089	<0.00089	<0.00089
F1 (C6-C10)	mg/L	2.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	1.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	0.118	<0.25	<0.1	<0.10	<0.10	<0.10	<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	-	15	17	22	20.8	12.9	41	19	37	15	51	18	20	23	44	16
TOC	mg/L	-	8.1	8.8	8.2	6.6	7.8	7.1	6.4	6.7	6.6	6.2	6.7	5	5	5	6	5	8	-	6	7	-	-	-	-	-	-	-	-	-	-	-	-	-
DOC	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6	6.1	6.2	8	5.9	6	5.3	5.7	4.7	6.6	5.9	6.7	6.1
Oil & Grease	mg/L	-	<1	2	<1	<1	9	<5	<5	<5	10	6	7	<1	<1	<1	<1	<1	<1	-	<1	<1	-	-	-	-	-	-	-	-	-	-	-	-	-
Metals																																			
Aluminum	mg/L	0.0007 / 0.05 [5]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.030	<0.0030	0.0037	<0.003	0.074	<0.0030
Antimony	mg/L	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	-	<0.0004	0.0009	-	-	<0.00040	<0.006	<0.0060	<0.0060	<0.0060	<0.0060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic	mg/L	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	0.00035	0.00027	0.00024	0.00050	0.00025
Barium	mg/L	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	-	0.01	0.008	0.008	0.0067	0.0101	<0.01	<0.010	<0.010	<0.010	<0.10	<0.10	<0.10	<0.1	<0.10	<0.01
Beryllium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.010	<0.0010	<0.001	-	<0.0010	
Boron	mg/L	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.25	0.25	0.25	0.24	0.25	0.21
Cadmium	mg/L	0.00004-0.00037 [2]	<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	-	<0.0001	0.0020	*<0.001*	*<0.0010*	0.00021	0.00013	0.000096	0.000082	0.00018	<0.00020	<0.000020	<0.000020	0.000021	<0.000020	<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	-	<0.005	<0.005	<0.005	<0.0050	<0.0050	<0.01	<0.010	<0.010	<0.010	<0.010	0.0015	<0.0010	<0.0010	0.0011	0.0012
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	-	<0.002	<0.002	<0.002	<0.0020	<0.0020	<0.003	<0.0030	<0.0030	<0.0030	<0.0030	<0.00030	<0.00030	<0.00030	<0.00030	
Copper	mg/L	0.007	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	-	0.006	0.005	0.009	0.0076	0.0093	<0.002	0.0046	<0.0020	<0.0020	<0.0020	0.0012	0.00037	0.00072	0.0021	0.0017
Lead	mg/L	0.001-0.007 [2]	<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	-	<0.0001	0.0002	*<0.005*	<0.0050	<0.00010	<0.002	<0.0020	<0.0020	<0.0020	<0.0020	<0.00020	<0.00020	<0.00020	0.00024	<0.00020
Lithium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.64	0.74	-	-	0.73	
Manganese	mg/L	0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.040	<0.040	<0.040	<0.04	<0.040	<0.0040
Mercury	mg/L	0.000005	*<0.0001*	*<0.0001*	*<0.0001*	*<0.0001*	*<0.0001*	*<0.01*	*<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	*<0.0020*	<0.0000050	<0.0000050	<0.0000050	<0.0000020	<0.0000020	<0.0000020	<0.0000020	<0.0000019
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	-	<0.005	.0005	<0.005	<0.0050	<0.0050	<0.002	<0.0020	<0.0020	<0.0020	<0.0020	0.00081	0.00082	0.00098	0.00084	
Nickel	mg/L	0.007-0.170 [2]	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	-	<0.002	0.005	0.004	0.0047	0.0044	<0.005	<0.0050	<0.0050	<0.0050	<0.0050	0.0020	0.0013	0.0016	0.0041	0.0026
Phosphorus	mg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<1.0	<1.0	<1	-	<1.0	
Selenium	mg/L	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	0.00036	0.00028	0.00037	0.00035	0.00056
Silicon	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.7	4.8	4.7	-	4.9	
Silver	mg/L	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*<0.0010*	<0.00010	<0.0001	<0.00010	<0.00010	<0.00010
Strontium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.5	2.4	2.5	-	2.7	
Sulphur	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1200	1200	1200	-	1200	
Thallium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	<0.00020	<0.0002	-	<0.00020	
Tin	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.010	<0.0010	<0.001	-	<0.0010	
Titanium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.010	<0.0010	<0.001	-	0.0014	
Uranium	mg/L	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0073	0.0079	0.0079	0.0072	0.0071	0.0099
Vanadium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.010	<0.0010	<0.0010	<0.0010	<0.0010	
Zinc	mg/L	0.03	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	-	0.005	0.020	0.024	0.006	0.0026	<0.03	<0.030	<0.030	<0.030	<0.030	<0.0030	<0.0030	<0.0030	0.0032	<0.0030

Notes:

[1] Alberta Environment and Parks (AEP). 2019. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. 198 pp. Referenced guidelines are for fine textured soils under Agricultural land use

[2] Guideline varies with hardness

[3] Guideline varies with chloride

[4] Guideline varies with pH and temperature

[5] Guideline varies with pH

"-" No applicable guideline or not analyzed

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Italic - Detection limit greater than Tier 1 Guideline

Table E22B: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 22B																											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	Jun-18	Jun-19	Jun-20
Volatile Organic Compounds (VOCs)																																			
Bromodichloromethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Bromoform	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Bromomethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	
Carbon tetrachloride	mg/L	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Chlorobenzene	mg/L	0.0013	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Chloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	
Chloroform	mg/L	0.08	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Chloromethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	
Dibromochloromethane	mg/L	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	<0.0010
1,2-Dibromoethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00020	
1,2-Dichlorobenzene	mg/L	0.0007	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,3-Dichlorobenzene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,4-Dichlorobenzene	mg/L	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,1-Dichloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,2-Dichloroethane	mg/L	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,1-Dichloroethene	mg/L	0.014	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,2-Dichloroethene (cis)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,2-Dichloroethene (trans)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,2-Dichloropropane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,3-Dichloropropene [cis]	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,3-Dichloropropene [trans]	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Methyl t-Butyl Ether (MTBE)	mg/L	0.015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Methylene Chloride	mg/L	0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	<0.0020
Methyl Methacrylate	mg/L	0.47	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Styrene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,1,1,2-Tetrachloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	
1,1,2,2-Tetrachloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	
Tetrachloroethene	mg/L	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,2,3-Trichlorobenzene	mg/L	0.008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	<0.0010
1,2,4-Trichlorobenzene	mg/L	0.015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	<0.0010
1,3,5-Trichlorobenzene	mg/L	0.014	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,1,1-Trichloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,1,2-Trichloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Trichloroethene	mg/L	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Trichlorofluoromethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Trihalomethanes	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0013	<0.0013
1,2,4-Trimethylbenzene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,3,5-Trimethylbenzene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Vinyl chloride	mg/L	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050

Notes:

[1] Alberta Environment and Parks (AEP). 2019. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. 198 pp. Referenced guidelines are for fine textured soils under Agricultural land use

[2] Guideline varies with hardness

[3] Guideline varies with chloride

[4] Guideline varies with pH and temperature

[5] Guideline varies with pH

"-" No applicable guideline or not analyzed

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Italic - Detection limit greater than Tier 1 Guideline

Table E23A: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 23A																											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	Jun-18	Jun-19	Jun-20
Field Measurements																																			
Field pH	-	-	-	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	8.6	8.12	8.74
Field EC	mS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	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	2.13	2.38	2.41	2.17
Field Temperature	°C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	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	6.8	11.6	7.8
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	8.51	8.70	8.63
Conductivity (EC)	µS/cm	1000	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	2200	2200	2200
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	4.1	4.0	3.2
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	0.49	0.54	0.54
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	560	560	590
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	2	1.8	1.9
Iron	mg/L	0.3	0.017	102	-	< 0.003	-	-	-	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	<0.06	<0.060	<0.060
Sulphate	mg/L	128-429 [2]	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	88	85	120
Chloride	mg/L	100	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	20	19	19
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	1300	1200	1200
Carbonate	mg/L	-	-	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	31	85	42
Hydroxide	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.50	<0.50	<0.5	<1.0	<1.0	<1.0
Nitrate (N)	mg/L	3	-	<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	<0.020	<0.010	<0.010
Nitrite (N)	mg/L	0.02 - 0.20 [3]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.010	<0.010	<0.033	<0.010	<0.010	<0.010
Nitrate and Nitrate (N)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.01	<0.020	-	<0.020	<0.014	<0.014
Total Dissolved Solids (TDS)	mg/L	500	3700	8570	4210	3030	-	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	1300	1300	1400
Hardness	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12	12	13	12	12	10
Alkalinity (total as CaCO3)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1100	1100	1100	1100	1100	1000
Alkalinity (pp as CaCO3)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14	22	45	-	71	
Ionic Balance	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.90	1.0	0.52	0.13	0.59	5.3
Water Nutrients																																			
Ammonia-N	mg/L	0.018-190 [4]	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	0.79	0.79	0.84
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	1.5	1.3	0.83
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	<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	<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	<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	<0.00089	<0.00089	<0.00089
F1 (C6-C10)	mg/L	2.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	<0.10	<0.10	<0.1	0.12	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	1.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	0.095	<0.25	<0.1	<0.10	<0.10	<0.10	<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	67	59	73
TOC	mg/L	-	7.8	25.6	16.5	11.5	14	2.9	20.8	15.8	14.5	14.5	20.8	31.6	14	13	17	16	16	14	8	16	-	-	-	-	-	-	-	-	-	-	-	-	
DOC	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14	15.2	16.8	16	19	18	16	16	16	21	17	19	14
Oil & Grease	mg/L	-	<1	-	<1	16	1	2	<5	<5	7	11	<1	5	<1	<1	<1	<1	<1	1	<1	<1	-	-	-	-	-	-	-	-	-	-	-	-	
Metals																																			
Aluminum	mg/L	0.0007 / 0.05 [5]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0043	0.0049	0.01	<0.003	0.016	0.0054
Antimony	mg/L	0.006	<0.005	-	-	0.008	-	-	-	-	<0.005	0.0015	0.007	0.0028	0.0007	0.0009	0.0015	<0.0004	0.0018	0.0017	0.0016	0.0008	-	-	<0.00040	0.006	<0.00060	0.0012	0.00082	<0.00060	<0.00060	0.0013	<0.00060	<0.00060	<0.00060
Arsenic	mg/L	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0065	0.0058	0.009	0.0056	0.0057	0.0064
Barium	mg/L	1	0.0463	-	-	0.0149	-	-	-	-	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	0.058	0.061	0.055
Beryllium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	<0.0010	<0.001	-	<0.0010	
Boron	mg/L	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.77	0.88	0.85	0.87	0.82	0.86
Cadmium	mg/L	0.00004-0.00037 [2]	<0.0005	-	-	<0.0005	-	-	-	-	<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	0.000026	<0.000020	<0.000020
Chromium	mg/L	0.05	<0.0008	-	-	<0.0008	-	-	-	-	<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	<0.0010	<0.0010	<0.0010
Cobalt	mg/L	-	0.0015	-	-	0.0019	-	-	-	-	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	<0.00030	<0.00030	
Copper	mg/L	0.007	<0.001	-	-	0.002	-	-	-	-	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	0.00029	0.0006	0.00038
Lead	mg/L	0.001-0.007 [2]	0.002	-	-	0.002	-	-	-	-	<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	<0.00020	<0.00020	<0.0002
Lithium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.098	0.11	-	-	0.10	
Manganese	mg/L	0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0071	0.0079	0.0064	0.0084	0.008	0.005
Mercury	mg/L	0.000005	*<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*	*<0.00010*	*<0.00010*	<0.000005	*<0.0020*	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000020	<0.000002	<0.0000020	<0.0000019
Molybdenum	mg/L	-	0.003	-	-	0.035	-	-	-	-	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	0.0042	0.0039	
Nickel	mg/L	0.007-0.170 [2]	0.019	-	-	0.011	-	-	-	-	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	0.0022	0.0032	0.0016
Phosphorus	mg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.18	0.12	<0.1	-	0.14	
Selenium	mg/L	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.0031
Silicon	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.9	3.1	3.1	-	3.3	
Silver	mg/L	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00010	<0.00010	<0.0001	<0.00010	<0.00010	<0.00010
Strontium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.11	0.11	0.12	-	0.12	
Sulphur	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	26	28	23	-	28	
Thallium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00020	<0.00020	<0.0002	-	<0.00020	
Tin	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	<0.0010	<0.001	-	<0.0010	
Titanium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	<0.0010	<0.001	-	<0.0010	
Uranium	mg/L	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0032	0.0027	0.0049	0.0024	0.0017	0.0018
Vanadium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	<0.0010	<0.001	-	<0.0010	
Zinc	mg/L	0.03	0.0096	-	-	0.0067	-	-	-	-	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	<0.0030	<0.0030	<0.0030

Notes:

[1] Alberta Environment and Parks (AEP). 2019. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. 198 pp. Referenced guidelines are for fine textured soils under Agricultural land use

[2] Guideline varies with hardness

[3] Guideline varies with chloride

[4] Guideline varies with pH and temperature

[5] Guideline varies with pH

"-" No applicable guideline or not analyzed

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Italic - Detection limit greater than Tier 1 Guideline

Table E23A: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 23A																											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	Jun-18	Jun-19	Jun-20
Volatile Organic Compounds (VOCs)																																			
Bromodichloromethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Bromoform	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Bromomethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	
Carbon tetrachloride	mg/L	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Chlorobenzene	mg/L	0.0013	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Chloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	
Chloroform	mg/L	0.08	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Chloromethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	
Dibromochloromethane	mg/L	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	<0.0010
1,2-Dibromoethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00020	
1,2-Dichlorobenzene	mg/L	0.0007	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,3-Dichlorobenzene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,4-Dichlorobenzene	mg/L	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,1-Dichloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,2-Dichloroethane	mg/L	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,1-Dichloroethene	mg/L	0.014	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,2-Dichloroethene (cis)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,2-Dichloroethene (trans)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,2-Dichloropropane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,3-Dichloropropene [cis]	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,3-Dichloropropene [trans]	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Methyl t-Butyl Ether (MTBE)	mg/L	0.015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Methylene Chloride	mg/L	0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	<0.0020
Methyl Methacrylate	mg/L	0.47	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Styrene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,1,1,2-Tetrachloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	
1,1,2,2-Tetrachloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	
Tetrachloroethene	mg/L	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,2,3-Trichlorobenzene	mg/L	0.008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	<0.0010
1,2,4-Trichlorobenzene	mg/L	0.015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	<0.0010
1,3,5-Trichlorobenzene	mg/L	0.014	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,1,1-Trichloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,1,2-Trichloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Trichloroethene	mg/L	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Trichlorofluoromethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Trihalomethanes	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0013	<0.0013
1,2,4-Trimethylbenzene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,3,5-Trimethylbenzene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Vinyl chloride	mg/L	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050

Notes:

[1] Alberta Environment and Parks (AEP). 2019. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. 198 pp. Referenced guidelines are for fine textured soils under Agricultural land use

[2] Guideline varies with hardness

[3] Guideline varies with chloride

[4] Guideline varies with pH and temperature

[5] Guideline varies with pH

"-" No applicable guideline or not analyzed

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Italic - Detection limit greater than Tier 1 Guideline

Table E23B: Field Data and Chemical Analysis Results

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	Jun-18	Jun-19	Jun-20
Field Measurements																																	
Field pH	-	-	6.98	-	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	-	7.43	7.17	5.77	7.5	7.8	7.45	7.3	7.7	7.41	7.3
Field EC	mS	-	-	-	-	-	-	-	-	-	-	-	-	-	9.44	24.7 (EF)	11.1	7.19	23.8	21.1	8.730	1.816	-	9.39	4.38	10.67	9.8	9.75	10.17	9.7	10.68	9.97	10.02
Field Temperature	°C	-	-	-	-	-	-	-	-	-	-	-	-	-	9.8	8.2	5.9	6.6	6.0	7.2	9.0	13.2	-	12.9	8.8	9.5	9.9	9.8	10.3	9.3	8	9.9	8.3
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	7.95	8.09	8.04
Conductivity (EC)	µS/cm	1000	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	10000	10,000	9,900
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	170	160	180
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	68	63	67
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	2400	2300	2500
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	12	11	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	<0.60	*<0.60*	<0.60
Sulphate	mg/L	128-429 [2]	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	4800	4600	5000
Chloride	mg/L	100	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	3.2	4.4	4.2
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	1100	1100	980
Carbonate	mg/L	-	-	-	<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	<1.0	<1.0	<1.0
Hydroxide	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.50	<0.50	<0.5	<1.0	<1.0	<1.0
Nitrate (N)	mg/L	3	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	0.068	0.21	0.24
Nitrite (N)	mg/L	0.02 - 0.20 [3]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.015	<0.010	<0.16	<0.01	0.022	0.026
Nitrate and Nitrate (N)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.087	0.32	-	0.068	0.23	0.26
Total Dissolved Solids (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	8000	7600	8300
Hardness	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	670	670	690	710	650	730
Alkalinity (total as CaCO3)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	860	860	870	860	860	800
Alkalinity (pp as CaCO3)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.50	<0.50	<0.5	-	<1.0	
Ionic Balance	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.94	0.98	1.3	1.2	0.80	0.89
Water Nutrients																																	
Ammonia-N	mg/L	0.018-190 [4]	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	0.33	0.25	0.38
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	0.71	0.63	0.54
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	<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	<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	<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	<0.00089	<0.00089	<0.00089
F1 (C6-C10)	mg/L	2.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	1.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	0.061	<0.25	<0.1	0.23	<0.10	<0.10	<0.10	<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	28	32	75
TOC	mg/L	-	8.5	9.4	7.8	9.4	8.4	8.3	7.5	7.7	7.6	7.5	7	7	7	7	8	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
DOC	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7	6.8	7.2	9.6	6.5	7.1	5.8	7.4	5.5	9.5	6.6	7.7	7.8
Oil & Grease	mg/L	-	<1	<1	2	12	<5	<5	<5	11	<5	6	<1	<1	<1	<1	<1	<1	<1	<1	-	-	-	-	-	-	-	-	-	-	-	-	-
Metals																																	
Aluminum	mg/L	0.0007 / 0.05 [5]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.030	0.0081	<0.0030	<0.003	<0.0030	<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	-	-	<0.00040	<0.006	<0.0060	<0.0060	<0.0060	<0.0060	<0.00060	<0.00060	<0.00072	<0.00060	<0.00060
Arsenic	mg/L	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	0.00024	0.0003	0.00022	0.00023	0.00033
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	<0.10	<0.10	<0.010
Beryllium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.010	<0.0010	<0.001	-	<0.0010	0.33
Boron	mg/L	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.35	0.40	0.36	0.35	0.32	
Cadmium	mg/L	0.00004-0.00037 [2]	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	0.000035	0.000094	0.000078
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	<0.0010	<0.0010	<0.0010	<0.0010	<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	<0.00030	0.00033	0.00035	0.00040	
Copper	mg/L	0.007	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	0.0003	0.00080	0.00021
Lead	mg/L	0.001-0.007 [2]	<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	<0.0002	<0.00020	<0.00020
Lithium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.75	0.86	-	-	0.79	
Manganese	mg/L	0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.14	0.065	0.12	0.12	0.11	0.14
Mercury	mg/L	0.000005	*<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*	*<0.00010*	*<0.00010*	<0.000005	0.0000025	<0.0000050	<0.0000050	<0.0000050	<0.0000020	<0.0000020	<0.0000020	<0.0000020	<0.0000019
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	0.0003	0.00031	
Nickel	mg/L	0.007-0.170 [2]	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	0.0013	0.0019	0.011
Phosphorus	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<1.0	<1.0	<1	-	<1.0	
Selenium	mg/L	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Silicon	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.4	5.5	5.4	-	5.1	
Silver	mg/L	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*<0.0010*	<0.00010	<0.0001	<0.00010	<0.00010	<0.00010
Strontium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3.6	3.7	3.9	-	4.0	
Sulphur	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1600	1600	1600	-	1500	
Thallium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	<0.00020	<0.0002	-	<0.00020	
Tin	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.010	<0.0010	<0.001	-	<0.0010	
Titanium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.010	<0.0010	<0.001	-	<0.0010	
Uranium	mg/L	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0023	0.0020	0.0035	0.0032	0.0029	0.0025
Vanadium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.010	<0.0010	<0.001	-	<0.0010	
Zinc	mg/L	0.03	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	<0.0030	<0.0030	<00030

Notes:

[1] Alberta Environment and Parks (AEP). 2019. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. 198 pp. Referenced guidelines are for fine textured soils under Agricultural land use

[2] Guideline varies with hardness

[3] Guideline varies with chloride

[4] Guideline varies with pH and temperature

[5] Guideline varies with pH

"-" No applicable guideline or not analyzed

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Italic - Detection limit greater than Tier 1 Guideline

Table E23B: Field Data and Chemical Analysis Results

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	Jun-18	Jun-19	Jun-20
Volatile Organic Compounds (VOCs)																																	
Bromodichloromethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Bromoform	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Bromomethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	
Carbon tetrachloride	mg/L	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Chlorobenzene	mg/L	0.0013	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Chloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	
Chloroform	mg/L	0.08	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Chloromethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	
Dibromochloromethane	mg/L	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	<0.0010
1,2-Dibromoethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00020	
1,2-Dichlorobenzene	mg/L	0.0007	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,3-Dichlorobenzene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,4-Dichlorobenzene	mg/L	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,1-Dichloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,2-Dichloroethane	mg/L	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,1-Dichloroethene	mg/L	0.014	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,2-Dichloroethene (cis)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,2-Dichloroethene (trans)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,2-Dichloropropane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,3-Dichloropropene [cis]	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,3-Dichloropropene [trans]	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Methyl t-Butyl Ether (MTBE)	mg/L	0.015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Methylene Chloride	mg/L	0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	<0.0020
Methyl Methacrylate	mg/L	0.47	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Styrene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,1,1,2-Tetrachloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	
1,1,2,2-Tetrachloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	
Tetrachloroethene	mg/L	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,2,3-Trichlorobenzene	mg/L	0.008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	<0.0010
1,2,4-Trichlorobenzene	mg/L	0.015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	<0.0010
1,3,5-Trichlorobenzene	mg/L	0.014	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,1,1-Trichloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,1,2-Trichloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Trichloroethene	mg/L	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Trichlorofluoromethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Trihalomethanes	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0013	<0.0013
1,2,4-Trimethylbenzene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,3,5-Trimethylbenzene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Vinyl chloride	mg/L	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050

Notes:

[1] Alberta Environment and Parks (AEP). 2019. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. 198 pp. Referenced guidelines are for fine textured soils under Agricultural land use

[2] Guideline varies with hardness

[3] Guideline varies with chloride

[4] Guideline varies with pH and temperature

[5] Guideline varies with pH

"-" No applicable guideline or not analyzed

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Italic - Detection limit greater than Tier 1 Guideline

Table E25A: Field Data and Chemical Analysis Results

Parameter ID	Units	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	Jun-18	Jun-19	Jun-20
Field Measurements																						
Field pH	-	-	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	8.5	8.17	8.32
Field EC	mS	-	-	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	2.32	2.12	2.08
Field Temperature	°C	-	-	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	6.5	10.8	8.6
Routine Water																						
pH	-	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	8.51	8.58	8.51
Conductivity (EC)	µS/cm	1000	4660	2380	2120	2110	2070	2070	2080	2000	2100	2050	2100	2200	2100	2000	2100	2100	2000	2100	2100	2100
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	4.7	4.6	4.9
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	0.45	0.45	0.49
Sodium	mg/L	200	1270	625	558	557	539	553	585	543	511	436	450	490	570	480	490	540	490	550	540	570
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	1.8	1.7	2
Iron	mg/L	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	0.069	<0.060	<0.060
Sulphate	mg/L	128-429 [2]	2090	323	60.7	102	52.1	36.2	21.3	24.7	19.8	13.2	-	3.2	7.1	14	13	4.3	3.1	<1.0	<1.0	2.2
Chloride	mg/L	100	30	14	11	3	10	9	10	10	7.74	7.24	10	8.3	8.5	8	9.2	8.4	8.9	9.4	8.7	9.3
Bicarbonate	mg/L	-	812	1220	1350	1350	1260	1330	1400	1430	1360	1320	1300	1300	1400	1400	1400	1400	1400	1400	1300	1300
Carbonate	mg/L	-	31	25	42	25	53	55	38	26	50.7	49	38	62	39	<0.50	11	19	28	30	68	28
Hydroxide	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.50	<0.50	<0.5	<1.0	<1.0	<1.0
Nitrate (N)	mg/L	3	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	<0.020	<0.010	0.52
Nitrite (N)	mg/L	0.02 - 0.20 [3]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.21	0.029	0.27	<0.010	0.081	0.1
Nitrate and Nitrate (N)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.1	0.21	0.53	<0.020	0.081	0.62
Total Dissolved Solids (TDS)	mg/L	500	3900	1600	1340	1360	1280	1310	1350	1310	1270	1220	1200	1200	1300	1200	1200	1300	1200	1300	1300	1300
Hardness	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13	15	13	14	13	14
Alkalinity (total as CaCO3)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1200	1200	1200	1200	1200	1100
Alkalinity (pp as CaCO3)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9.0	16	23	-	57	
Ionic Balance	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.91	1.0	4.6	0.22	0.54	5.1
Water Nutrients																						
Ammonia-N	mg/L	0.018-190 [4]	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	0.76	0.71	0.66
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	1.2	1.0	1.2
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	<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	<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	<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	<0.00089	<0.00089	<0.00089
F1 (C6-C10)	mg/L	2.2	-	-	-	-	-	-	-	<0.1	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	1.1	-	-	-	-	-	-	-	<0.05	<0.050	<0.25	-	<0.10	<0.10	<0.10	<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	29	32	23
TOC	mg/L	-	8	13	8	9	9	9	9	-	-	-	-	-	-	-	-	-	-	-	-	
DOC	mg/L	-	-	-	-	-	-	-	-	7	9	9.7	14	9.8	9.3	7.9	8.1	7.9	9.6	8.7	10	8.8
Oil & Grease	mg/L	-	<1	1	<1	3	1	<1	1	-	-	-	-	-	-	-	-	-	-	-	-	
Metals																						
Aluminum	mg/L	0.0007 / 0.05 [5]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0051	0.0046	0.0043	0.0034	0.012	<0.0030
Antimony	mg/L	0.006	0.001	0.0114	0.0012	0.0018	0.0015	0.0012	0.0011	-	-	0.00086	0.0011	0.0033	0.0012	0.00078	0.0011	<0.00060	0.00064	<0.00060	<0.00060	0.00076
Arsenic	mg/L	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0021	0.0019	0.0023	0.0024	0.0023	0.002
Barium	mg/L	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	0.08	0.098	0.099
Beryllium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	<0.0010	<0.001	-	<0.0010	
Boron	mg/L	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.81	0.94	0.83	0.89	0.85	0.89
Cadmium	mg/L	0.00004-0.00037 [2]	*<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	<0.00002	<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	<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	0.00033	<0.00030	
Copper	mg/L	0.007	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	<0.00020	0.0020	0.0055
Lead	mg/L	0.001-0.007 [2]	<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	<0.00020	0.00020	<0.00020
Lithium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.10	0.11	-	-	0.097	
Manganese	mg/L	0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.051	0.10	0.07	0.13	0.063	0.051
Mercury	mg/L	0.000005	*<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	<0.000002	<0.0000020	<0.0000019
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	0.0076	0.0063	
Nickel	mg/L	0.007-0.170 [2]	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	0.0015	0.0021	0.0023
Phosphorus	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.11	<0.10	<0.1	-	0.12	
Selenium	mg/L	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.00041	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Silicon	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.7	3.4	2.9	-	3.3	
Silver	mg/L	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00010	<0.00010	<0.0001	<0.00010	<0.00010	<0.00010
Strontium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.11	0.11	0.11	-	0.12	
Sulphur	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3.2	2.4	1.3	-	0.72	
Thallium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00020	<0.00020	<0.0002	-	<0.00020	
Tin	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	<0.0010	<0.001	-	<0.0010	
Titanium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	<0.0010	<0.001	-	<0.0010	
Uranium	mg/L	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0015	0.00074	0.0012	0.00036	0.0010	0.0018
Vanadium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0021	0.0013	0.0015	-	<0.0010	
Zinc	mg/L	0.03	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	<0.0030	<0.0030	<0.0030

Notes:

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[2] Guideline varies with hardness

[3] Guideline varies with chloride

[4] Guideline varies with pH and temperature

[5] Guideline varies with pH

"-" No applicable guideline or not analyzed

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Italic - Detection limit greater than Tier 1 Guideline

Table E25A: Field Data and Chemical Analysis Results

Parameter ID	Units	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	Jun-18	Jun-19	Jun-20
Polycyclic Aromatic Hydrocarbons (PAHs)																						
Benzo[a]pyrene equivalency	mg/L	0.00004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.000010	<0.000010	-	<0.000010	
Acenaphthene	mg/L	0.006	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00010	<0.00010	-	<0.00010	
Acenaphthylene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00010	<0.00010	-	<0.00010	
Acridine	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00020	<0.00020	-	<0.000040	<0.00050
Anthracene	mg/L	0.0034	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.000010	<0.000010	-	<0.000010	<0.00050
Benz(a)anthracene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0000085	<0.0000085	-	<0.0000085	
Benzo(a) pyrene	mg/L	0.0018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0000075	<0.0000075	-	<0.0000075	<0.00050
Benzo(b+j)fluoranthene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0000085	<0.0000085	-	<0.0000085	
Benzo(c)phenanthrene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.000050	<0.000050	-	<0.000050	<0.0010
Benzo(e)pyrene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.000050	<0.000050	-	<0.000050	
Benzo(g,h,i)perylene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0000085	<0.0000085	-	<0.0000085	<0.00050
Benzo(k)fluoranthene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0000085	<0.0000085	-	<0.0000085	
Chrysene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0000085	<0.0000085	-	<0.0000085	<0.00050
Dibenz(a,h)anthracene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0000075	<0.0000075	-	<0.0000075	
Fluoranthene	mg/L	0.24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.000010	<0.000010	-	<0.000010	<0.00050
Fluorene	mg/L	0.0042	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.000050	<0.000050	-	<0.000050	<0.00050
Indeno(1,2,3-c,d)pyrene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0000085	<0.0000085	-	<0.0000085	
1-Methylnaphthalene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00010	
2-Methylnaphthalene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00010	<0.00010	-	<0.00010	
Naphthalene	mg/L	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00010	<0.00010	-	<0.00010	
Perylene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.000050	<0.000050	-	<0.000050	
Phenanthrene	mg/L	0.00086	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.000050	<0.000050	-	<0.000050	<0.00050
Pyrene	mg/L	0.71	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.000020	<0.000020	-	<0.000020	<0.0020
Quinoline	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00020	<0.00020	-	<0.00020	<0.00050
Volatile Organic Compounds (VOCs)																						
Bromodichloromethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Bromoform	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Bromomethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	<0.00050
Carbon tetrachloride	mg/L	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.0010
Chlorobenzene	mg/L	0.0013	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.0010
Chloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	<0.00050
Chloroform	mg/L	0.08	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Chloromethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	
Dibromochloromethane	mg/L	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	<0.00050
1,2-Dibromoethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00020	
1,2-Dichlorobenzene	mg/L	0.0007	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.0013
1,3-Dichlorobenzene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,4-Dichlorobenzene	mg/L	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,1-Dichloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,2-Dichloroethane	mg/L	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,1-Dichloroethene	mg/L	0.014	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,2-Dichloroethene (cis)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,2-Dichloroethene (trans)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,2-Dichloropropane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,3-Dichloropropene [cis]	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,3-Dichloropropene [trans]	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Methyl t-Butyl Ether (MTBE)	mg/L	0.015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Methylene Chloride	mg/L	0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	
Methyl Methacrylate	mg/L	0.47	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Styrene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,1,1,2-Tetrachloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	
1,1,2,2-Tetrachloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	
Tetrachloroethene	mg/L	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,2,3-Trichlorobenzene	mg/L	0.008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	
1,2,4-Trichlorobenzene	mg/L	0.015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	
1,3,5-Trichlorobenzene	mg/L	0.014	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,1,1-Trichloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,1,2-Trichloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Trichloroethene	mg/L	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Trichlorofluoromethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Trihalomethanes	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0013	
1,2,4-Trimethylbenzene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,3,5-Trimethylbenzene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Vinyl chloride	mg/L	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	

Notes:

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[2] Guideline varies with hardness

[3] Guideline varies with chloride

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Detection limit adjusted (*)

Exceeds Regulatory Limit

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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	Jun-18	Jun-19	Jun-20
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	7.7	7.52	7.2
Field EC	mS	-	-	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	9.2	9.25	9.43
Field Temperature	°C	-	-	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	7.6	11.5	11.8
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	7.85	8.17	8.14
Conductivity (EC)	µS/cm	1000	4860	8300	7490	8100	8660	8970	9120	8790	8900	9200	9200	9200	9400	9400	9500	9500	9500	9600	9500	9400
Calcium	mg/L	-	52.7	172	145	172	168	172	175	174	175	181 *	180	190	170	190	190	190	190	200	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	54	52	51
Sodium	mg/L	200	1520	2150	2310	2170	2190	2260	2300	2180	2160	2180 *	2200	2500	2200	2300	2200	2100	2300	2400	2400	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	13	12	11
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	<0.60	*<0.60*	*<0.60*
Sulphate	mg/L	128-429 [2]	2720	3880	4420	4290	4210	4140	4480	4090	4350	4370 *	4800	4700	5100	5200	4600	4500	4100	4600	4400	4500
Chloride	mg/L	100	2	2	3	10	2	3	2	3	1.69	<10 *	3	1.4	2	1.9	2.2	2.5	2.3	2.3	2.7	2.5
Bicarbonate	mg/L	-	973	1050	1060	1040	988	1030	1070	1080	1060	1040	1000	1000	1000	1100	1000	970	1000	1000	1000	960
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	<1.0	<1.0	<1.0
Hydroxide	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.50	<0.50	<0.5	<1.0	<1.0	<1.0
Nitrate (N)	mg/L	3	< 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	0.6	0.80	0.97
Nitrite (N)	mg/L	0.02 - 0.20 [3]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.016	0.019	<0.16	0.05	0.018	<0.010
Nitrate and Nitrate (N)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.78	0.64	-	0.65	0.82	0.97
Total Dissolved Solids (TDS)	mg/L	500	4850	6770	7450	7210	7120	7140	7550	7040	7270	7300	7800	8000	8000	8300	7600	7300	7100	7800	7500	7600
Hardness	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	690	680	700	710	680	680
Alkalinity (total as CaCO3)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	850	790	840	840	850	
Alkalinity (pp as CaCO3)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.50	<0.50	<0.5	-	<1.0	
Ionic Balance	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.97	0.95	6	2.2	4.1	1.8
Water Nutrients																						
Ammonia-N	mg/L	0.018-190 [4]	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	<0.015	0.15	0.07
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	0.55	0.52	0.48
Hydrocarbons																						
Benzene	mg/L	0.005	-	-	-	-	-	-	-	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.0004	<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	<0.0004	<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	<0.0004	<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	<0.0008	<0.00089	<0.00089	<0.00089
F1 (C6-C10)	mg/L	2.2	-	-	-	-	-	-	-	<0.1	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	1.1	-	-	-	-	-	-	-	<0.05	<0.050	<0.25	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10
Organics																						
COD	mg/L	-	30	25	26	26	27	25	19	34	22.6	19	42	36	42	35	29	30	27	27	32	26
TOC	mg/L	-	8	10	10	10	10	10	11	-	-	-	-	-	-	-	-	-	-	-	-	
DOC	mg/L	-	-	-	-	-	-	-	-	9	8.9	9.8	9.3	9.2	8.4	9	9.9	10	12	10	11	10
Oil & Grease	mg/L	-	< 1	<1	<1	<1	<1	<1	<1	-	-	-	-	-	-	-	-	-	-	-	-	
Metals																						
Aluminum	mg/L	0.0007 / 0.05 [5]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.030	0.0084	0.0053	<0.003	<0.0030	<0.0030
Antimony	mg/L	0.006	0.0008	0.0014	0.0004	0.0008	0.0010	<0.0004	0.0006	-	-	<0.00040	<0.006	<0.0060	<0.0060	<0.0060	<0.0060	<0.00060	<0.0006	<0.00077	<0.00060	<0.00060
Arsenic	mg/L	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	0.00055	0.00047	0.00041	0.00039	0.00038
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	<0.10	<0.10	0.017
Beryllium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.010	<0.0010	<0.001	-	<0.0010	
Boron	mg/L	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.46	0.46	0.47	0.48	0.50	0.44
Cadmium	mg/L	0.00004-0.00037 [2]	*<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	<0.00002	0.000026	<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	<0.0010	<0.0010	<0.0010
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	0.00051	0.00062	
Copper	mg/L	0.007	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	0.00096	0.0016	0.0019
Lead	mg/L	0.001-0.007 [2]	<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	<0.0002	<0.00020	<0.00020
Lithium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.62	0.64	-	-	0.73	
Manganese	mg/L	0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.17	0.18	0.21	0.18	0.19	0.19
Mercury	mg/L	0.000005	*<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	<0.0000020	<0.0000020	<0.0000019
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	0.0009	0.0010	0.0007
Nickel	mg/L	0.007-0.170 [2]	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	0.0025	0.0042	0.0026
Phosphorus	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<1.0	<0.10	<1	-	<1.0	
Selenium	mg/L	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	<0.00020	<0.0002	<0.00020	<0.00020	<0.00020
Silicon	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.6	4.5	4.4	-	4.6	
Silver	mg/L	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*<0.0010*	<0.00010	<0.0001	<0.00010	<0.00010	<0.00010
Strontium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.0	3.7	4.3	-	4.6	
Sulphur	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1500	1600	1600	-	1600	
Thallium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	<0.00020	<0.0002	-	<0.00020	
Tin	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.010	<0.0010	<0.001	-	<0.0010	
Titanium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.010	0.0011	<0.001	-	<0.0010	
Uranium	mg/L	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	0.00033	0.00028	0.00027	0.00029	0.00023
Vanadium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.010	<0.0010	<0.001	-	<0.0010	
Zinc	mg/L	0.03	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	<0.0030	0.0036	<0.0030

Notes:

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Polycyclic Aromatic Hydrocarbons (PAHs)																						
Benzo[a]pyrene equivalency	mg/L	0.00004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.000010	<0.000010	-	<0.000010	
Acenaphthene	mg/L	0.006	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00010	<0.00010	-	<0.00010	
Acenaphthylene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00010	<0.00010	-	<0.00010	
Acridine	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00020	<0.00020	-	<0.000040	
Anthracene	mg/L	0.0034	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.000010	<0.000010	-	<0.000010	
Benz(a)anthracene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0000085	<0.0000085	-	<0.0000085	
Benzo(a) pyrene	mg/L	0.0018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0000075	<0.0000075	-	<0.0000075	
Benzo(b+j)fluoranthene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0000085	<0.0000085	-	<0.0000085	
Benzo(c)phenanthrene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.000050	<0.000050	-	<0.000050	
Benzo(e)pyrene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.000050	<0.000050	-	<0.000050	
Benzo(g,h,i)perylene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0000085	<0.0000085	-	<0.0000085	
Benzo(k)fluoranthene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0000085	<0.0000085	-	<0.0000085	
Chrysene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0000085	<0.0000085	-	<0.0000085	
Dibenz(a,h)anthracene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0000075	<0.0000075	-	<0.0000075	
Fluoranthene	mg/L	0.24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.000010	<0.000010	-	<0.000010	
Fluorene	mg/L	0.0042	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.000050	<0.000050	-	<0.000050	
Indeno(1,2,3-c,d)pyrene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0000085	<0.0000085	-	<0.0000085	
1-Methylnaphthalene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00010	
2-Methylnaphthalene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00010	<0.00010	-	<0.00010	
Naphthalene	mg/L	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00010	<0.00010	-	<0.00010	
Perylene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.000050	<0.000050	-	<0.000050	
Phenanthrene	mg/L	0.00086	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.000050	<0.000050	-	<0.000050	
Pyrene	mg/L	0.71	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.000020	<0.000020	-	<0.000020	
Quinoline	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00020	<0.00020	-	<0.00020	
Volatile Organic Compounds (VOCs)																						
Bromodichloromethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Bromoform	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Bromomethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	
Carbon tetrachloride	mg/L	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Chlorobenzene	mg/L	0.0013	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Chloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	
Chloroform	mg/L	0.08	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Chloromethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	
Dibromochloromethane	mg/L	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	<0.0010
1,2-Dibromoethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00020	
1,2-Dichlorobenzene	mg/L	0.0007	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,3-Dichlorobenzene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,4-Dichlorobenzene	mg/L	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,1-Dichloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,2-Dichloroethane	mg/L	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,1-Dichloroethene	mg/L	0.014	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,2-Dichloroethene (cis)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,2-Dichloroethene (trans)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,2-Dichloropropane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,3-Dichloropropene [cis]	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,3-Dichloropropene [trans]	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Methyl t-Butyl Ether (MTBE)	mg/L	0.015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Methylene Chloride	mg/L	0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	<0.0020
Methyl Methacrylate	mg/L	0.47	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Styrene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,1,1,2-Tetrachloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	
1,1,2,2-Tetrachloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	
Tetrachloroethene	mg/L	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,2,3-Trichlorobenzene	mg/L	0.008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	<0.0010
1,2,4-Trichlorobenzene	mg/L	0.015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	<0.0010
1,3,5-Trichlorobenzene	mg/L	0.014	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,1,1-Trichloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,1,2-Trichloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Trichloroethene	mg/L	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Trichlorofluoromethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Trihalomethanes	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0013	<0.0013
1,2,4-Trimethylbenzene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,3,5-Trimethylbenzene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Vinyl chloride	mg/L	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050

Notes:

[1] Alberta Environment and Parks (AEP). 2019. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. 198 pp. Referenced guidelines are for fine textured soils under Agricultural land use

[2] Guideline varies with hardness

[3] Guideline varies with chloride

[4] Guideline varies with pH and temperature

[5] Guideline varies with pH

"-" No applicable guideline or not analyzed

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Italic - Detection limit greater than Tier 1 Guideline

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	Jun-18	Jun-19	Jun-20
Field Measurements																							
Field pH	-	-	8.11	7.01	8.1	8.2	7.7	-	NM	8.62	-	8.4	8.51	8.48	8.1	8.31	9.9	-	-	-	8.6	8.43	-
Field EC	mS	-	-	-	8.18 (EF)	3.51	6.53	-	4.26	6.54	-	2.162	2.4	2.94	2.15	2.97	2.91	-	-	-	2.96	2.85	-
Field Temperature	°C	-	-	-	2.9	7.8	7.9	-	8.5	8.32	-	12.3	10.7	10.5	8.6	9.4	6.7	-	-	-	7	18.7	-
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	8.51	-	8.51
Conductivity (EC)	µS/cm	1000	2640	3930	3310	3010	6550	2980	2970	3020	2850	2900	2890	2900	2800	2,700	2700	2700	2600	2600	2700	-	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 *	9.5	8.2	9.2
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 *	1.2	1.0	1.1
Sodium	mg/L	200	769	938	798	750	1640	759	771	787	674	650	672	770	680	690	680	650	640	670 *	640	650	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 *	2.4	2.3	2.3
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 *	<0.06	<0.060	<0.060
Sulphate	mg/L	128-429 [2]	812	1240	948	783	2970	720	731	756	629	633	651	680	730	610	610	520	490	510	510	-	510
Chloride	mg/L	100	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	5.9	-	6
Bicarbonate	mg/L	-	968	930	965	989	907	1010	1020	988	1030	999	967	1000	970	1,000	1000	1100	1100	1100	1100	-	990
Carbonate	mg/L	-	31	22	38	32	20	16	12	31	24	43.4	40.3	29	41	34	15	8.6	23	23	24	-	24
Hydroxide	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.50	<0.50	<0.5	<1.0	-	<1.0
Nitrate (N)	mg/L	3	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	0.9	-	1.5
Nitrite (N)	mg/L	0.02 - 0.20 [3]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.010	0.075	<0.033	<0.010	-	<0.010
Nitrate and Nitrate (N)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.94	1.1	1.3	0.92	-	1.5
Total Dissolved Solids (TDS)	mg/L	500	2130	2710	2290	2080	5220	2020	2050	2090	1860	1840	1860	2000	2000	1,900	1800	1700	1700	1700	1700	-	1700
Hardness	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	28	26	26	29	-	27
Alkalinity (total as CaCO3)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	900	910	900	910	-	850
Alkalinity (pp as CaCO3)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7.1	19	20	-	-	
Ionic Balance	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.0	1.0	1	0.78	-	3.2
Water Nutrients																							
Ammonia-N	mg/L	0.018-190 [4]	0.75	0.2	0.96	0.27	0.58	-	<0.05	<0.05	<0.05	<0.050	0.209	<0.05	<0.050	<0.05	<0.050	<0.050	<0.050	<0.015	<0.015	0.021	0.028
TKN	mg/L	-	1.8	4.4	2.3	1.0	0.9	-	0.8	0.6	0.7	0.49	1.34	0.58	0.89	1.2	0.78	1.7	1.2	0.77	1.8	0.75	1.6
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	<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	<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	<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	<0.00089	<0.00089	-
F1 (C6-C10)	mg/L	2.2	-	-	-	-	-	-	-	-	<0.1	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	-
F2 (>C10-C16)	mg/L	1.1	-	-	-	-	-	-	-	-	<0.05	0.071	<0.25	<0.1	<0.10	<0.21	<0.10	<0.26	<0.10	<0.10	<0.10	<0.10	-
Organics																							
COD	mg/L	-	40	37	25	24	30	-	24	25	24	20.9	15.8	33	50	77	29	-	51	26	120	39	66
TOC	mg/L	-	10	212	8	9	7	-	9	10	-	-	-	-	-	-	-	-	-	-	-	-	
DOC	mg/L	-	-	-	-	-	-	-	-	-	8	8.7	8.9	9.9	9.8	9.8	7.8	9.3	10	-	9.4	-	8.9
Oil & Grease	mg/L	-	< 1	<1	<1	3	<1	-	<3	1	-	-	-	-	-	-	-	-	-	-	-	-	
Metals																							
Aluminum	mg/L	0.0007 / 0.05 [5]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0049	0.15	0.0099 *	0.0038	0.0073	0.0084
Antimony	mg/L	0.006	0.002	0.0018	0.0013	0.0014	0.0005	-	0.0011	0.0008	-	-	<0.00040	<0.0006	<0.00060	0.00061	<0.00060	<0.00060	<0.00060	<0.00060 *	<0.00060	<0.00060	<0.00060
Arsenic	mg/L	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0021	0.0024	0.0023 *	0.0021	0.0020	0.0018
Barium	mg/L	1	0.096	0.018	0.015	0.029	0.017	-	0.034	0.029	0.031	0.036	0.0397	0.041	0.039	0.041	0.045	0.033	0.047	0.054 *	0.053	0.048	0.054
Beryllium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	<0.0010	- *	-	<0.0010	
Boron	mg/L	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.74	0.85	0.81 *	0.8	0.80	0.83
Cadmium	mg/L	0.00004-0.00037 [2]	*< 0.001*	<0.0001	<0.0001	0.0001	0.0001	-	<0.0001	<0.0001	*<0.001*	*<0.0010*	0.00005	0.000076	*<0.050*	0.00021	0.000034	<0.000020	<0.000020	<0.000020 *	<0.00002	<0.000020	<0.000020
Chromium	mg/L	0.05	0.006	0.007	<0.005	0.006	<0.005	-	<0.005	<0.005	<0.005	<0.0050	<0.0050	<0.001	<0.0010	0.0015	0.0012	<0.0010	<0.0010	<0.0010 *	<0.0010	<0.0010	<0.0010
Cobalt	mg/L	-	0.004	<0.002	<0.002	<0.002	<0.002	-	<0.002	<0.002	<0.002	<0.0020	<0.0020	<0.0003	<0.00030	0.00032	0.00034	<0.00030	<0.00030	<0.00030 *	<0.00030	<0.00030	
Copper	mg/L	0.007	0.011	0.006	0.007	0.007	0.006	-	0.003	0.002	0.016	0.0028	0.0031	0.0016	0.00068	0.0020	0.0018	0.0015	0.0058	0.004 *	0.0034	0.0043	0.0038
Lead	mg/L	0.001-0.007 [2]	< 0.005	0.0004	<0.0001	0.0052	<0.0001	-	0.0004	0.0010	<0.005	<0.0050	0.00017	<0.0002	0.00022	<0.00020	0.0012	<0.00020	0.00083	<0.060 *	<0.00020	<0.00020	<0.00020
Lithium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.12	0.14	0.15 *	-	0.13	
Manganese	mg/L	0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0098	<0.0040	<0.0040 *	0.005	0.0077	<0.0040
Mercury	mg/L	0.000005	*< 0.0002*	*<0.0001*	*<0.0001*	*<0.0001*	*<0.0001*	-	*<0.0001*	*<0.0001*	*<0.0001*	*<0.00010*	*<0.00010*	<0.000005	0.0000021	<0.000010	<0.0000050	<0.0000050	<0.0000020	-	0.000003	-	<0.0000019
Molybdenum	mg/L	-	0.025	0.008	0.008	0.005	<0.005	-	<0.005	<0.005	<0.005	<0.0050	<0.0050	0.0034	0.0036	0.0034	0.0029	0.0020	0.0035	0.0026 *	0.0024	0.0021	
Nickel	mg/L	0.007-0.170 [2]	0.016	0.004	0.010	0.003	0.004	-	<0.002	<0.002	<0.002	<0.0020	<0.0020	0.0015	0.0029	0.0019	0.0024	0.0017	0.0039	8.5 *	0.002	0.0016	0.00073
Phosphorus	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.13	0.21	- *	-	0.13	
Selenium	mg/L	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00020	<0.00020	0.0019 *	<0.00020	<0.00020	<0.00020
Silicon	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3.9	4.1	- *	-	4.1	
Silver	mg/L	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00010	<0.00010	- *	<0.00010	<0.00010	<0.00010
Strontium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.21	0.19	- *	-	0.19	
Sulphur	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	160	160	- *	-	150	
Thallium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00020	<0.00020	- *	-	<0.00020	
Tin	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	<0.0010	- *	-	<0.0010	
Titanium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	0.0029	- *	-	<0.0010	
Uranium	mg/L	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.00063	0.00065	0.00063 *	0.00069	0.00059	0.00062
Vanadium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0053	0.014	- *	-	0.0014	
Zinc	mg/L	0.03	0.013	0.011	0.005	0.010	0.008	-	0.015	0.037	0.022	0.0433	0.0079	0.014	0.0039	0.0064	0.013	<0.0030	<0.0030	0.0032 *	<0.0030	<0.0030	<0.0030

Notes:

[1] Alberta Environment and Parks (AEP). 2019. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. 198 pp. Referenced guidelines are for fine textured soils under Agricultural land use

[2] Guideline varies with hardness

[3] Guideline varies with chloride

[4] Guideline varies with pH and temperature

[5] Guideline varies with pH

"-" No applicable guideline or not analyzed

Equipment Failure, parameter not reported (EF)

Lab Filtered (*)

Not measured (NM)

Exceeds Regulatory Limit

Italic - Detection limit greater than Tier 1 Guideline

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	Jun-18	Jun-19	Jun-20
Volatile Organic Compounds (VOCs)																							
Bromodichloromethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Bromoform	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Bromomethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	
Carbon tetrachloride	mg/L	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Chlorobenzene	mg/L	0.0013	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Chloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	
Chloroform	mg/L	0.08	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Chloromethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	
Dibromochloromethane	mg/L	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	<0.0010
1,2-Dibromoethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00020	
1,2-Dichlorobenzene	mg/L	0.0007	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,3-Dichlorobenzene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,4-Dichlorobenzene	mg/L	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,1-Dichloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,2-Dichloroethane	mg/L	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,1-Dichloroethene	mg/L	0.014	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,2-Dichloroethene (cis)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,2-Dichloroethene (trans)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,2-Dichloropropane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,3-Dichloropropene [cis]	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,3-Dichloropropene [trans]	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Methyl t-Butyl Ether (MTBE)	mg/L	0.015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Methylene Chloride	mg/L	0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	<0.0020
Methyl Methacrylate	mg/L	0.47	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Styrene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,1,1,2-Tetrachloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	
1,1,2,2-Tetrachloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	
Tetrachloroethene	mg/L	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,2,3-Trichlorobenzene	mg/L	0.008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	<0.0010
1,2,4-Trichlorobenzene	mg/L	0.015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	<0.0010
1,3,5-Trichlorobenzene	mg/L	0.014	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,1,1-Trichloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,1,2-Trichloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Trichloroethene	mg/L	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Trichlorofluoromethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Trihalomethanes	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0013	<0.0013
1,2,4-Trimethylbenzene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,3,5-Trimethylbenzene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Vinyl chloride	mg/L	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050

Notes:

[1] Alberta Environment and Parks (AEP). 2019. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. 198 pp. Referenced guidelines are for fine textured soils under Agricultural land use
[2] Guideline varies with hardness
[3] Guideline varies with chloride
[4] Guideline varies with pH and temperature
[5] Guideline varies with pH
"-" No applicable guideline or not analyzed
Equipment Failure, parameter not reported (EF)
Lab Filtered (*)
Not measured (NM)
Exceeds Regulatory Limit
Italic - Detection limit greater than Tier 1 Guideline

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	Jun-18	Jun-19	Jun-20
Field Measurements																							
Field pH	-	-	-	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	6.85	7.52	7.08
Field EC	mS	-	-	-	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	7.81	6.85	7.786	7.65
Field Temperature	°C	-	-	-	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	6.7	11.5	7
Routine Water																							
pH	-	6.5 - 8.5	-	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	8.12	8.19	8.16
Conductivity (EC)	µS/cm	1000	-	5980	6130	5520	6360	6440	6710	6660	6510	6560	6470	6400	6300	6400	6100	7100	7400	7600	7400	7700	7500
Calcium	mg/L	-	-	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	120	110	120
Magnesium	mg/L	-	-	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	67	64	65
Sodium	mg/L	200	-	2200	1560	1620	1560	1600	1610	1640	1540	1560	1370	1500	1700	1500	1400	1600	1600	1800	1800	1800	1800
Potassium	mg/L	-	-	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	8	7.5	7.4
Iron	mg/L	0.3	-	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	<0.60	*<0.60*	<0.60
Sulphate	mg/L	128-429 [2]	-	4180	2690	2820	2870	2810	2740	2960	2820	2890	2480 *	2600	2900	3000	3000	3300	3400	3200	3300	3400	3300
Chloride	mg/L	100	-	4	2	2	2	1	2	2	2	0.62	<10 *	2	<1.0	1.6	1.7	3.5	3.9	4.5	5.6	6.0	5.6
Bicarbonate	mg/L	-	-	973	1000	998	993	926	1010	1010	1040	1030	1000	980	1000	1000	960	1000	990	1000	1100	1000	960
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	<1.0	<1.0	<1.0
Hydroxide	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.50	<0.50	<0.5	<1.0	<1.0	<1.0
Nitrate (N)	mg/L	3	-	<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	0.09	0.048	0.18
Nitrite (N)	mg/L	0.02 - 0.20 [3]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.039	0.036	<0.16	0.012	0.027	0.1
Nitrate and Nitrate (N)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.27	0.23	-	0.1	0.074	0.29
Total Dissolved Solids (TDS)	mg/L	500	-	7030	4890	5070	5070	5030	5000	5250	5020	5100	4470	4700	5200	5100	4900	5600	5600	5700	5800	5800	5700
Hardness	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	490	500	570	560	540	580
Alkalinity (total as CaCO3)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	830	810	860	860	830	790
Alkalinity (pp as CaCO3)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.50	<0.50	<0.5	-	<1.0	
Ionic Balance	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.95	0.91	3.1	3.7	0.58	4
Water Nutrients																							
Ammonia-N	mg/L	0.018-190 [4]	-	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	0.49	0.60	0.58
TKN	mg/L	-	-	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	1.1	0.98	0.96
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	<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	<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	<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	<0.00089	<0.00089	<0.00089
F1 (C6-C10)	mg/L	2.2	-	-	-	-	-	-	-	-	<0.1	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	1.1	-	-	-	-	-	-	-	-	<0.05	<0.050	<0.25	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Organics																							
COD	mg/L	-	-	50	28	22	22	22	21	21	29	20.3	19.2	46	29	59	49	24	35	28	29	44	34
TOC	mg/L	-	-	11	9	9	9	10	9	10	-	-	-	-	-	-	-	-	-	-	-	-	
DOC	mg/L	-	-	-	-	-	-	-	-	-	9	8.2	8.9	8.6	8.3	8.7	7.3	9.0	10	12	9.6	12	10
Oil & Grease	mg/L	-	-	< 1	<1	<1	<1	2	<1	<1	-	-	-	-	-	-	-	-	-	-	-	-	
Metals																							
Aluminum	mg/L	0.0007 / 0.05 [5]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.030	0.0095	0.0072	<0.003	<0.0030	<0.0030
Antimony	mg/L	0.006	-	0.0012	0.0006	<0.0004	0.0010	0.0007	<0.0004	0.0007	-	-	<0.00040	<0.006	<0.0060	<0.0060	<0.0060	<0.0060	<0.00060	<0.0006	<0.00082	<0.00060	<0.00060
Arsenic	mg/L	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	0.00081	0.00077	0.00056	0.00052	0.00052
Barium	mg/L	1	-	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	<0.10	<0.10	<0.010
Beryllium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.010	<0.0010	<0.001	-	<0.0010	
Boron	mg/L	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.30	0.32	0.29	0.3	0.31	0.3
Cadmium	mg/L	0.00004-0.00037 [2]	-	*< 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	<0.00002	<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	<0.01	<0.010	<0.010	<0.010	<0.010	0.0017	<0.001	<0.0010	<0.0010	<0.0010
Cobalt	mg/L	-	-	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	0.00076	0.00071	
Copper	mg/L	0.007	-	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	0.00071	0.00084	0.00037
Lead	mg/L	0.001-0.007 [2]	-	<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	<0.0002	<0.00020	<0.00020
Lithium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.38	0.38	-	-	0.41	
Manganese	mg/L	0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.20	0.20	0.22	0.20	0.22	0.21
Mercury	mg/L	0.000005	-	*<0.0002*	*<0.0001*	*<0.0001*	*<0.0001*	*<0.0001*	*<0.0001*	*0.0002*	*<0.0001*	*<0.0010*	*<0.00010*	<0.000005	0.0000038	<0.0000050	<0.0000050	<0.0000050	0.0000040	<0.000002	0.0000026	<0.0000020	<0.0000019
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	0.0022	<0.0020	<0.0020	0.0024	0.0013	0.00087	0.0018	0.00094	0.00068
Nickel	mg/L	0.007-0.170 [2]	-	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	0.0019	0.0017	0.0012
Phosphorus	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<1.0	<0.10	<1	-	<1.0	
Selenium	mg/L	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	<0.00020	<0.0002	0.0002	<0.00020	<0.00020
Silicon	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.3	4.4	4.5	-	4.5	
Silver	mg/L	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	<0.00010	<0.0001	<0.00010	<0.00010	<0.00010
Strontium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.0	2.0	2.5	-	2.5	
Sulphur	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1000	1100	1200	-	1100	
Thallium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	<0.00020	<0.0002	-	<0.00020	
Tin	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.010	<0.0010	<0.001	-	<0.0010	
Titanium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.010	<0.0010	<0.001	-	<0.0010	
Uranium	mg/L	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.001	0.0012	0.00082	0.00094	0.00095	0.00086
Vanadium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.010	<0.0010	<0.001	-	<0.0010	
Zinc	mg/L	0.03	-	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	<0.0030	<0.0030	<0.0030

Notes:

[1] Alberta Environment and Parks (AEP). 2019. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. 198 pp. Referenced guidelines are for fine textured soils under Agricultural land use

[2] Guideline varies with hardness

[3] Guideline varies with chloride

[4] Guideline varies with pH and temperature

[5] Guideline varies with pH

"-" No applicable guideline or not analyzed

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Italic - Detection limit greater than Tier 1 Guideline

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	Jun-18	Jun-19	Jun-20
Polycyclic Aromatic Hydrocarbons (PAHs)																							
Benzo[a]pyrene equivalency	mg/L	0.00004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0037	<0.000010	<0.000010	<0.000010	<0.000010	-
Acenaphthene	mg/L	0.006	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00010	<0.00010	<0.00010	<0.00010	-
Acenaphthylene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00010	<0.00010	<0.00010	<0.00010	-
Acridine	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00020	<0.00020	<0.00020	<0.000040	-
Anthracene	mg/L	0.0034	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.000010	<0.000010	<0.000010	<0.000010	-
Benz(a)anthracene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0000085	<0.0000085	<0.0000085	<0.0000085	-
Benzo(a) pyrene	mg/L	0.0018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0000075	<0.0000075	<0.0000075	<0.0000075	-
Benzo(b+j)fluoranthene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0026	<0.0000085	<0.0000085	<0.0000085	<0.0000085	-
Benzo(c)phenanthrene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0017	<0.000050	<0.000050	<0.000050	<0.000050	-
Benzo(e)pyrene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0014	<0.000050	<0.000050	<0.000050	<0.000050	-
Benzo(g,h,i)perylene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0014	<0.0000085	<0.0000085	<0.0000085	<0.0000085	-
Benzo(k)fluoranthene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0015	<0.0000085	<0.0000085	<0.0000085	<0.0000085	-
Chrysene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0015	<0.0000085	<0.0000085	<0.0000085	<0.0000085	-
Dibenz(a,h)anthracene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0014	<0.0000075	<0.0000075	<0.0000075	<0.0000075	-
Fluoranthene	mg/L	0.24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0018	<0.000010	<0.000010	<0.000010	<0.000010	-
Fluorene	mg/L	0.0042	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0018	<0.000050	<0.000050	<0.000050	<0.000050	-
Indeno(1,2,3-c,d)pyrene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0014	<0.0000085	<0.0000085	<0.0000085	<0.0000085	-
1-Methylnaphthalene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00010	-
2-Methylnaphthalene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0019	<0.00010	<0.00010	<0.00010	<0.00010	-
Naphthalene	mg/L	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0020	<0.00010	<0.00010	<0.00010	<0.00010	-
Perylene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0015	<0.000050	<0.000050	<0.000050	<0.000050	-
Phenanthrene	mg/L	0.00086	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0019	<0.000050	<0.000050	<0.000050	<0.000050	-
Pyrene	mg/L	0.71	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0019	<0.000020	<0.000020	<0.000020	<0.000020	-
Quinoline	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0019	<0.00020	<0.00020	<0.00020	<0.00020	-
Volatile Organic Compounds (VOCs)																							
Bromodichloromethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Bromoform	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Bromomethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	
Carbon tetrachloride	mg/L	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Chlorobenzene	mg/L	0.0013	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Chloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	
Chloroform	mg/L	0.08	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Chloromethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	
Dibromochloromethane	mg/L	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	<0.0010
1,2-Dibromoethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00020	
1,2-Dichlorobenzene	mg/L	0.0007	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,3-Dichlorobenzene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,4-Dichlorobenzene	mg/L	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,1-Dichloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,2-Dichloroethane	mg/L	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,1-Dichloroethene	mg/L	0.014	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,2-Dichloroethene (cis)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,2-Dichloroethene (trans)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,2-Dichloropropane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,3-Dichloropropene [cis]	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,3-Dichloropropene [trans]	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Methyl t-Butyl Ether (MTBE)	mg/L	0.015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Methylene Chloride	mg/L	0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	<0.0020
Methyl Methacrylate	mg/L	0.47	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Styrene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,1,1,2-Tetrachloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	
1,1,2,2-Tetrachloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	
Tetrachloroethene	mg/L	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,2,3-Trichlorobenzene	mg/L	0.008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	<0.0010
1,2,4-Trichlorobenzene	mg/L	0.015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	<0.0010
1,3,5-Trichlorobenzene	mg/L	0.014	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,1,1-Trichloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,1,2-Trichloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Trichloroethene	mg/L	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Trichlorofluoromethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Trihalomethanes	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0013	<0.0013
1,2,4-Trimethylbenzene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,3,5-Trimethylbenzene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Vinyl chloride	mg/L	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050

Notes:

[1] Alberta Environment and Parks (AEP). 2019. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. 198 pp. Referenced guidelines are for fine textured soils under Agricultural land use

[2] Guideline varies with hardness

[3] Guideline varies with chloride

[4] Guideline varies with pH and temperature

[5] Guideline varies with pH

"-" No applicable guideline or not analyzed

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Italic - Detection limit greater than Tier 1 Guideline

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	Jun-18	Jun-19	Jun-20
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	7.96	8.48	8.4
Field EC	mS	-	15.95	2.890	1.125	2.8	2.98	1.3	3.66	2.89	2.88	2.86	2.81	3.12	3.05	2.93
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	6.5	11.8	6.2
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	8.41	8.59	8.47
Conductivity (EC)	µS/cm	1000	3960	2990	2940	2790	2800	2700	2800	2800	2900	2800	2900	2800	2900	2800
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	8.4	8.4	8.9
Magnesium	mg/L	-	10.3	4.1	2.66	1.79	1.5	1.5	1.4	1.2	1.1	1.0	1	1	0.97	0.96
Sodium	mg/L	200	1030	756	678	668	700	740	670	730	690	620	700	740	700	750
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	2.2	2.1	2.4
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	<0.06	<0.060	<0.060
Sulphate	mg/L	128-429 [2]	1260	775	681	630	710	630	730	770	730	710	720	700	660	680
Chloride	mg/L	100	10	7	5.26	4.42	8	4.4	5.8	6.2	5.2	5.0	6.9	5.1	5.5	5.7
Bicarbonate	mg/L	-	1010	992	924	898	900	940	910	920	930	850	920	950	860	930
Carbonate	mg/L	-	35	24	48.2	37.6	24	14	35	27	7.5	21	26	11	49	16
Hydroxide	mg/L	-	-	-	-	-	-	-	-	-	<0.50	<0.50	<0.5	<1.0	<1.0	<1.0
Nitrate (N)	mg/L	3	<0.1	0.1	0.273	0.419	0.21	0.093	0.14	0.11	0.046	0.21	0.47	0.26	0.33	0.31
Nitrite (N)	mg/L	0.02 - 0.20 [3]	-	-	-	-	-	-	-	-	0.17	0.071	0.28	<0.010	0.029	0.032
Nitrate and Nitrate (N)	mg/L	-	-	-	-	-	-	-	-	-	0.22	0.28	-	0.26	0.36	0.34
Total Dissolved Solids (TDS)	mg/L	500	2860	2070	1880	1800	1900	1900	1900	2000	1900	1800	1900	1900	1900	1900
Hardness	mg/L	-	-	-	-	-	-	-	-	-	26	25	26	25	25	26
Alkalinity (total as CaCO3)	mg/L	-	-	-	-	-	-	-	-	-	780	730	800	790	790	790
Alkalinity (pp as CaCO3)	mg/L	-	-	-	-	-	-	-	-	-	6.3	17	21	-	41	
Ionic Balance	N/A	-	-	-	-	-	-	-	-	-	0.99	0.94	0.027	3.6	1.8	4.7
Water Nutrients																
Ammonia-N	mg/L	0.018-190 [4]	0.50	0.89	0.499	0.456	0.89	0.87	0.85	0.97	0.63	0.86	0.86	0.61	0.66	0.81
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	1.1	0.85	0.85
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	<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	<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	<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	<0.00089	<0.00089	<0.00089
F1 (C6-C10)	mg/L	2.2	-	<0.1	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	1.1	-	<0.05	<0.050	<0.25	<0.1	<0.10	<0.10	<0.10	<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	32	40	31
TOC	mg/L	-	16	-	-	-	-	-	-	-	-	-	-	-	-	
DOC	mg/L	-	-	11	201	11.5	12	9.5	10	11	11	11	14	11	13	12
Oil & Grease	mg/L	-	<1	-	-	-	-	-	-	-	-	-	-	-	-	
Metals																
Aluminum	mg/L	0.0007 / 0.05 [5]	-	-	-	-	-	-	-	-	0.0043	0.073	0.029	0.006	0.0036	0.022
Antimony	mg/L	0.006	0.0014	-	-	<0.00040	<0.006	<0.0030	0.0017	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic	mg/L	0.005	-	-	-	-	-	-	-	-	0.0024	0.0028	0.003	0.0027	0.0023	0.0025
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	0.014	0.013	0.014
Beryllium	mg/L	-	-	-	-	-	-	-	-	-	<0.0010	<0.0010	<0.001	-	<0.0010	
Boron	mg/L	1	-	-	-	-	-	-	-	-	0.77	0.75	0.83	0.82	0.81	0.79
Cadmium	mg/L	0.00004-0.00037 [2]	<0.0001	*<0.001*	*<0.0010*	<0.000050	<0.000050	0.000027	0.000026	<0.000025	<0.000020	<0.000020	<0.000020	<0.00002	<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	<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	<0.00030	<0.00030	
Copper	mg/L	0.007	0.002	0.004	0.0026	0.0027	<0.002	0.0038	0.0014	0.0019	0.00053	0.00098	0.0003	0.00047	0.00024	0.00059
Lead	mg/L	0.001-0.007 [2]	<0.0001	<0.005	<0.0050	0.00012	<0.002	0.0015	<0.00020	0.00077	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Lithium	mg/L	-	-	-	-	-	-	-	-	-	0.11	0.12	-	-	0.12	
Manganese	mg/L	0.05	-	-	-	-	-	-	-	-	0.013	0.011	0.012	0.011	0.011	0.012
Mercury	mg/L	0.000005	*<0.0001*	*<0.0001*	*<0.00010*	*<0.00010*	<0.000005	0.0000022	<0.0000050	<0.0000050	<0.0000050	0.0000021	<0.0000020	0.0000023	<0.0000020	<0.0000019
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	0.0015	0.0012	
Nickel	mg/L	0.007-0.170 [2]	0.003	<0.002	0.0027	<0.0020	<0.005	0.0068	0.002	0.003	0.0012	0.0033	0.0014	0.00073	<0.00050	0.00054
Phosphorus	mg/L	-	-	-	-	-	-	-	-	-	0.23	0.28	0.16	-	0.19	
Selenium	mg/L	0.002	-	-	-	-	-	-	-	-	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Silicon	mg/L	-	-	-	-	-	-	-	-	-	3.9	3.5	4	-	3.9	
Silver	mg/L	0.0001	-	-	-	-	-	-	-	-	<0.00010	<0.00010	<0.0001	<0.00010	<0.00010	<0.00010
Strontium	mg/L	-	-	-	-	-	-	-	-	-	0.20	0.21	0.22	-	0.21	
Sulphur	mg/L	-	-	-	-	-	-	-	-	-	220	200	240	-	220	
Thallium	mg/L	-	-	-	-	-	-	-	-	-	<0.00020	<0.00020	<0.0002	-	<0.00020	
Tin	mg/L	-	-	-	-	-	-	-	-	-	<0.0010	<0.0010	<0.001	-	<0.0010	
Titanium	mg/L	-	-	-	-	-	-	-	-	-	<0.0010	0.0017	<0.001	-	<0.0010	
Uranium	mg/L	0.01	-	-	-	-	-	-	-	-	0.00055	0.00065	0.00057	0.00055	0.00054	0.00058
Vanadium	mg/L	-	-	-	-	-	-	-	-	-	0.0020	0.020	0.0092	-	<0.0010	
Zinc	mg/L	0.03	0.011	0.008	0.0217	0.0045	<0.03	<0.015	0.0057	0.0049	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030

Notes:

[1] Alberta Environment and Parks (AEP). 2019. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. 198 pp. Referenced guidelines are for fine textured soils under Agricultural land use

[2] Guideline varies with hardness

[3] Guideline varies with chloride

[4] Guideline varies with pH and temperature

[5] Guideline varies with pH

"-" No applicable guideline or not analyzed

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Italic - Detection limit greater than Tier 1 Guideline

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	Jun-18	Jun-19	Jun-20
Volatile Organic Compounds (VOCs)																
Bromodichloromethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Bromoform	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Bromomethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	
Carbon tetrachloride	mg/L	0.002	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Chlorobenzene	mg/L	0.0013	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Chloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	
Chloroform	mg/L	0.08	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Chloromethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	
Dibromochloromethane	mg/L	0.1	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	<0.0010
1,2-Dibromoethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00020	
1,2-Dichlorobenzene	mg/L	0.0007	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,3-Dichlorobenzene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,4-Dichlorobenzene	mg/L	0.001	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,1-Dichloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,2-Dichloroethane	mg/L	0.005	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,1-Dichloroethene	mg/L	0.014	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,2-Dichloroethene (cis)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,2-Dichloroethene (trans)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,2-Dichloropropane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,3-Dichloropropene [cis]	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,3-Dichloropropene [trans]	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Methyl t-Butyl Ether (MTBE)	mg/L	0.015	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Methylene Chloride	mg/L	0.05	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	<0.0020
Methyl Methacrylate	mg/L	0.47	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Styrene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,1,1,2-Tetrachloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	
1,1,2,2-Tetrachloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	
Tetrachloroethene	mg/L	0.01	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,2,3-Trichlorobenzene	mg/L	0.008	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	<0.0010
1,2,4-Trichlorobenzene	mg/L	0.015	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	<0.0010
1,3,5-Trichlorobenzene	mg/L	0.014	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,1,1-Trichloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,1,2-Trichloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Trichloroethene	mg/L	0.005	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Trichlorofluoromethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Trihalomethanes	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0013	<0.0013
1,2,4-Trimethylbenzene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,3,5-Trimethylbenzene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Vinyl chloride	mg/L	0.002	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050

Notes:

[1] Alberta Environment and Parks (AEP). 2019. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. 198 pp. Referenced guidelines are for fine textured soils under Agricultural land use

[2] Guideline varies with hardness

[3] Guideline varies with chloride

[4] Guideline varies with pH and temperature

[5] Guideline varies with pH

"-" No applicable guideline or not analyzed

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Italic - Detection limit greater than Tier 1 Guideline

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	Jun-18	Jun-19	Jun-20
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	7.4	7.60	7.40
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	12.54	11.47	11.57
Field Temperature	°C	-	9.66	4.7	10.5	13.4	13	10.9	10.1	9.8	9.1	7.8	8.3	6.9	11.2	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	7.96	8.22	8.12
Conductivity (EC)	µS/cm	1000	9620	8440	8320	8240	10,000	10,000	11,000	11,000	11,000	11,000	12,000	12,000	12,000	12,000
Calcium	mg/L	-	91.5	83.4	74.4	71.2	100	130	110	130	130	140	140	150	140	140
Magnesium	mg/L	-	85.6	53	45.8	40.7	82	96	96	110	100	100	130	110	120	110
Sodium	mg/L	200	2530	2170	1980	1930	2600	2900	2900	2800	2700	2700	3100	3100	3000	3200
Potassium	mg/L	-	8.6	4.1	9.01	8.13	9.1	9.5	9.3	9.2	11	11	11	11	10	10
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	<0.60	*<0.60*	<0.60
Sulphate	mg/L	128-429 [2]	4520	3610	3580	3280 *	4700	5600	6000	6100	5100	5300	5100	5400	5300	5500
Chloride	mg/L	100	41	41	35.6	28 *	37	36	37	40	35	42	51	49	74	94
Bicarbonate	mg/L	-	1420	1380	1270	1250	1400	1500	1600	1700	1700	1600	1900	1800	1800	1600
Carbonate	mg/L	-	<5	<5	25.7	12.5	<0.5	<0.50	27	<0.50	<0.50	<0.50	<0.50	<1.0	<1.0	<1.0
Hydroxide	mg/L	-	-	-	-	-	-	-	-	-	<0.50	<0.50	<0.5	<1.0	<1.0	<1.0
Nitrate (N)	mg/L	3	0.1	0.1	0.448	<1.0 *	0.11	0.11	0.35	0.29	1.1	0.91	1.5	1	<0.010	1.4
Nitrite (N)	mg/L	0.02 - 0.20 [3]	-	-	-	-	-	-	-	-	0.01	0.014	0.21	<0.01	0.029	0.022
Nitrate and Nitrate (N)	mg/L	-	-	-	-	-	-	-	-	-	1.1	0.92	-	1	0.029	1.5
Total Dissolved Solids (TDS)	mg/L	500	7970	6640	6370	5990	8200	9500	9900	10,000	9000	9100	9400	9700	9600	9900
Hardness	mg/L	-	-	-	-	-	-	-	-	-	740	770	860	830	820	830
Alkalinity (total as CaCO3)	mg/L	-	-	-	-	-	-	-	-	-	1400	1300	1500	1500	1500	1300
Alkalinity (pp as CaCO3)	mg/L	-	-	-	-	-	-	-	-	-	<0.50	<0.50	<0.5	-	<1.0	
Ionic Balance	N/A	-	-	-	-	-	-	-	-	-	0.99	0.97	4.4	2.5	2.1	4.8
Water Nutrients																
Ammonia-N	mg/L	0.018-190 [4]	0.63	0.98	0.571	0.625	0.72	0.6	0.53	0.51	0.15	0.42	0.67	0.16	0.20	0.17
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	1.1	0.99	0.85
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	<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	<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	<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	<0.00089	<0.00089	<0.00089
F1 (C6-C10)	mg/L	2.2	-	<0.1	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	1.1	-	<0.05	<0.050	<0.25	<0.1	<0.10	<0.10	<0.10	<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	43	37	33
TOC	mg/L	-	15	-	-	-	-	-	-	-	-	-	-	-	-	
DOC	mg/L	-	-	11	253	10.2	12	12	14	13	13	15	18	13	16	14
Oil & Grease	mg/L	-	<1	-	-	-	-	-	-	-	-	-	-	-	-	
Metals																
Aluminum	mg/L	0.0007 / 0.05 [5]	-	-	-	-	-	-	-	-	<0.060	0.0056	0.01	0.0031	0.0093	<0.0030
Antimony	mg/L	0.006	0.0013	-	-	0.00049	<0.006	<0.012	<0.012	<0.012	<0.012	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic	mg/L	0.005	-	-	-	-	-	-	-	-	<0.0040	0.0020	0.0019	0.0018	0.0017	0.0017
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	<0.10	<0.10	<0.010
Beryllium	mg/L	-	-	-	-	-	-	-	-	-	<0.020	<0.0010	<0.001	-	<0.0010	
Boron	mg/L	1	-	-	-	-	-	-	-	-	0.42	0.43	0.46	0.45	0.45	0.39
Cadmium	mg/L	0.00004-0.00037 [2]	0.0001	*<0.001*	*<0.0010*	0.00013	0.00006	*<0.10*	0.00011	<0.0001	<0.00040	0.00004	0.000022	0.000027	0.000026	0.000028
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	<0.0010	<0.0010	<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	0.0011	0.0011	
Copper	mg/L	0.007	0.006	0.009	0.0079	0.0089	<0.002	0.0073	<0.0040	<0.0040	<0.0040	0.0010	<0.00020	0.00067	0.00051	0.00041
Lead	mg/L	0.001-0.007 [2]	<0.0001	<0.005	<0.0050	0.00075	<0.002	<0.0040	<0.0040	<0.0040	<0.0040	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Lithium	mg/L	-	-	-	-	-	-	-	-	-	0.48	0.49	-	-	0.54	
Manganese	mg/L	0.05	-	-	-	-	-	-	-	-	0.052	0.052	0.062	0.053	0.051	0.056
Mercury	mg/L	0.000005	0.0002	*<0.0001*	*<0.00010*	*<0.00010*	<0.000005	*<0.0020*	<0.0000050	<0.0000050	<0.0000050	<0.0000020	<0.0000020	0.0000035	<0.0000020	<0.0000019
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	0.0022	0.0016	0.0016
Nickel	mg/L	0.007-0.170 [2]	0.019	0.009	0.0068	0.006	<0.005	<0.010	<0.010	<0.010	<0.010	0.0077	0.0051	0.005	0.0048	0.005
Phosphorus	mg/L	-	-	-	-	-	-	-	-	-	<1.0	0.14	<1	-	<1.0	
Selenium	mg/L	0.002	-	-	-	-	-	-	-	-	<0.0040	0.00039	0.0002	0.00033	<0.00020	<0.00020
Silicon	mg/L	-	-	-	-	-	-	-	-	-	4.2	4.2	4.5	-	4.5	
Silver	mg/L	0.0001	-	-	-	-	-	-	-	-	*<0.0020*	<0.00010	<0.0001	<0.00010	<0.00010	<0.00010
Strontium	mg/L	-	-	-	-	-	-	-	-	-	4.0	3.8	4.5	-	4.7	
Sulphur	mg/L	-	-	-	-	-	-	-	-	-	1700	1900	1900	-	1800	
Thallium	mg/L	-	-	-	-	-	-	-	-	-	<0.0040	<0.00020	<0.0002	-	<0.00020	
Tin	mg/L	-	-	-	-	-	-	-	-	-	<0.020	<0.0010	<0.001	-	<0.0010	
Titanium	mg/L	-	-	-	-	-	-	-	-	-	<0.020	<0.0010	<0.001	-	<0.0010	
Uranium	mg/L	0.01	-	-	-	-	-	-	-	-	0.0021	0.0025	0.0034	0.0021	0.0024	0.0023
Vanadium	mg/L	-	-	-	-	-	-	-	-	-	<0.020	0.0070	0.0054	-	<0.0010	
Zinc	mg/L	0.03	0.018	0.01	0.007	0.0096	<0.03	<0.060	<0.060	<0.060	<0.060	0.0048	<0.0030	<0.0030	<0.0030	<0.0030

Notes:

[1] Alberta Environment and Parks (AEP). 2019. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. 198 pp. Referenced guidelines are for fine textured soils under Agricultural land use

[2] Guideline varies with hardness

[3] Guideline varies with chloride

[4] Guideline varies with pH and temperature

[5] Guideline varies with pH

"-" No applicable guideline or not analyzed

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Italic - Detection limit greater than Tier 1 Guideline

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	Jun-18	Jun-19	Jun-20
Polycyclic Aromatic Hydrocarbons (PAHs)																
Benzo[a]pyrene equivalency	mg/L	0.00004	-	-	-	-	-	-	-	-	-	<0.000010	<0.000010	-	<0.000010	-
Acenaphthene	mg/L	0.006	-	-	-	-	-	-	-	-	-	<0.00010	<0.00010	-	<0.00010	-
Acenaphthylene	mg/L	-	-	-	-	-	-	-	-	-	-	<0.00010	<0.00010	-	<0.00010	-
Acridine	mg/L	-	-	-	-	-	-	-	-	-	-	<0.00020	<0.000050	-	<0.000040	-
Anthracene	mg/L	0.0034	-	-	-	-	-	-	-	-	-	<0.000010	<0.000010	-	<0.000010	-
Benz(a)anthracene	mg/L	-	-	-	-	-	-	-	-	-	-	<0.0000085	<0.0000085	-	<0.0000085	-
Benzo(a) pyrene	mg/L	0.0018	-	-	-	-	-	-	-	-	-	<0.0000075	<0.0000075	-	<0.0000075	-
Benzo(b+j)fluoranthene	mg/L	-	-	-	-	-	-	-	-	-	-	<0.0000085	<0.0000085	-	<0.0000085	-
Benzo(c)phenanthrene	mg/L	-	-	-	-	-	-	-	-	-	-	<0.000050	<0.000050	-	<0.000050	-
Benzo(e)pyrene	mg/L	-	-	-	-	-	-	-	-	-	-	<0.000050	<0.000050	-	<0.000050	-
Benzo(g,h,i)perylene	mg/L	-	-	-	-	-	-	-	-	-	-	<0.0000085	<0.0000085	-	<0.0000085	-
Benzo(k)fluoranthene	mg/L	-	-	-	-	-	-	-	-	-	-	<0.0000085	<0.0000085	-	<0.0000085	-
Chrysene	mg/L	-	-	-	-	-	-	-	-	-	-	<0.0000085	<0.0000085	-	<0.0000085	-
Dibenz(a,h)anthracene	mg/L	-	-	-	-	-	-	-	-	-	-	<0.0000075	<0.0000075	-	<0.0000075	-
Fluoranthene	mg/L	0.24	-	-	-	-	-	-	-	-	-	<0.000010	<0.000010	-	<0.000010	-
Fluorene	mg/L	0.0042	-	-	-	-	-	-	-	-	-	<0.000050	<0.000050	-	<0.000050	-
Indeno(1,2,3-c,d)pyrene	mg/L	-	-	-	-	-	-	-	-	-	-	<0.0000085	<0.0000085	-	<0.0000085	-
1-Methylnaphthalene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00010	-
2-Methylnaphthalene	mg/L	-	-	-	-	-	-	-	-	-	-	<0.00010	<0.00010	-	<0.00010	-
Naphthalene	mg/L	0.001	-	-	-	-	-	-	-	-	-	<0.00010	<0.00010	-	<0.00010	-
Perylene	mg/L	-	-	-	-	-	-	-	-	-	-	<0.000050	<0.000050	-	<0.000050	-
Phenanthrene	mg/L	0.00086	-	-	-	-	-	-	-	-	-	<0.000050	<0.000050	-	<0.000050	-
Pyrene	mg/L	0.71	-	-	-	-	-	-	-	-	-	<0.000020	<0.000020	-	<0.000020	-
Quinoline	mg/L	-	-	-	-	-	-	-	-	-	-	<0.00020	<0.00020	-	<0.00020	-
Volatile Organic Compounds (VOCs)																
Bromodichloromethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Bromoform	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Bromomethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	
Carbon tetrachloride	mg/L	0.002	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Chlorobenzene	mg/L	0.0013	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Chloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	
Chloroform	mg/L	0.08	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Chloromethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	
Dibromochloromethane	mg/L	0.1	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	<0.0010
1,2-Dibromoethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00020	
1,2-Dichlorobenzene	mg/L	0.0007	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,3-Dichlorobenzene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,4-Dichlorobenzene	mg/L	0.001	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,1-Dichloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,2-Dichloroethane	mg/L	0.005	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,1-Dichloroethene	mg/L	0.014	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,2-Dichloroethene (cis)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,2-Dichloroethene (trans)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,2-Dichloropropane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,3-Dichloropropene [cis]	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,3-Dichloropropene [trans]	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Methyl t-Butyl Ether (MTBE)	mg/L	0.015	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Methylene Chloride	mg/L	0.05	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	<0.0020
Methyl Methacrylate	mg/L	0.47	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Styrene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,1,1,2-Tetrachloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	
1,1,2,2-Tetrachloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0020	
Tetrachloroethene	mg/L	0.01	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,2,3-Trichlorobenzene	mg/L	0.008	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	<0.0010
1,2,4-Trichlorobenzene	mg/L	0.015	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	<0.0010
1,3,5-Trichlorobenzene	mg/L	0.014	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
1,1,1-Trichloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,1,2-Trichloroethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Trichloroethene	mg/L	0.005	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050
Trichlorofluoromethane	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Trihalomethanes	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0013	<0.0013
1,2,4-Trimethylbenzene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
1,3,5-Trimethylbenzene	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	
Vinyl chloride	mg/L	0.002	-	-	-	-	-	-	-	-	-	-	-	-	<0.00050	<0.00050

Notes:

[1] Alberta Environment and Parks (AEP). 2019. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. 198 pp. Referenced guidelines are for fine textured soils under Agricultural land use

[2] Guideline varies with hardness

[3] Guideline varies with chloride

[4] Guideline varies with pH and temperature

[5] Guideline varies with pH

"-" No applicable guideline or not analyzed

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Italic - Detection limit greater than Tier 1 Guideline

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	Jun-18	Jun-19	Jun-20
Field Measurements										
Field pH	-	-	8.28	8.4	8.4	8.51	8.5	7.94	8.47	8.27
Field EC	mS	-	3.66	3.63	3.59	3.38	3.49	3.38	3.62	3.39
Field Temperature	°C	-	10	6.2	8.5	7.7	6.7	8.6	11.2	8.9
Routine Water										
pH	-	6.5 - 8.5	8.48	8.46	8.34	8.54	8.47	8.43	8.57	8.38
Conductivity (EC)	µS/cm	1000	3400	3400	3400	3300	3300	3300	3400	3300
Calcium	mg/L	-	14	13	13	12	13	12	12	13
Magnesium	mg/L	-	1.5	1.4	1.3	1.1	1.2	1.2	1.1	1.3
Sodium	mg/L	200	820	850	870	800	810	860	810	850
Potassium	mg/L	-	2.6	2.5	3.1	2.6	2.7	2.5	2.5	2.6
Iron	mg/L	0.3	<0.060	0.29	<0.060	<0.060	<0.060	<0.06	<0.060	<0.060
Sulphate	mg/L	128-429 [2]	1200	1200	1100	1000	1000	1000	960	1200
Chloride	mg/L	100	5	5.3	5.0	5.2	5	4.7	5.2	4.8
Bicarbonate	mg/L	-	820	830	850	780	850	850	800	790
Carbonate	mg/L	-	18	19	3.4	16	13	15	34	6.4
Hydroxide	mg/L	-	-	-	<0.50	<0.50	<0.5	<1.0	<1.0	<1.0
Nitrate (N)	mg/L	3	0.037	0.027	<0.010	0.066	0.044	0.047	0.041	0.13
Nitrite (N)	mg/L	0.02 - 0.20 [3]	-	-	0.012	0.030	<0.033	0.037	0.046	0.017
Nitrate and Nitrate (N)	mg/L	-	-	-	0.012	0.096	-	0.084	0.087	0.15
Total Dissolved Solids (TDS)	mg/L	500	2400	2500	2400	2200	2300	2300	2200	2500
Hardness	mg/L	-	-	-	38	35	36	35	36	38
Alkalinity (total as CaCO3)	mg/L	-	-	-	710	660	720	720	710	
Alkalinity (pp as CaCO3)	mg/L	-	-	-	2.8	13	11	-	29	
Ionic Balance	N/A	-	-	-	1.1	1.0	0.99	3.6	2.4	0.65
Water Nutrients										
Ammonia-N	mg/L	0.018-190 [4]	1.2	1.3	1.1	1.2	1.4	1.1	1.3	1.2
TKN	mg/L	-	1.6	1.6	1.6	1.7	1.6	1.5	1.7	1.3
Hydrocarbons										
Benzene	mg/L	0.005	<0.00040	<0.00040	<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	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	<0.00040	<0.00040	<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	<0.00089	<0.00089	<0.00089
F1 (C6-C10)	mg/L	2.2	<0.10	<0.10	<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	<0.10	<0.10
Organics										
COD	mg/L	-	47	42	39	31	28	31	39	18
TOC	mg/L	-	-	-	-	-	-	-	-	
DOC	mg/L	-	11	9.6	8.5	10	12	9	11	9.1
Oil & Grease	mg/L	-	-	-	-	-	-	-	-	
Metals										
Aluminum	mg/L	0.0007 / 0.05 [5]	-	-	0.0046	0.012	0.005	<0.003	0.013	0.014
Antimony	mg/L	0.006	0.00061	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic	mg/L	0.005	-	-	0.001	0.00084	0.00053	0.00085	0.00064	0.00073
Barium	mg/L	1	0.013	0.015	<0.010	<0.010	<0.010	<0.010	0.011	<0.010
Beryllium	mg/L	-	-	-	<0.0010	<0.0010	<0.001	-	<0.0010	
Boron	mg/L	1	-	-	0.74	0.77	0.82	0.8	0.80	0.78
Cadmium	mg/L	0.00004-0.00037 [2]	<0.000025	<0.000025	<0.000020	<0.000020	<0.000020	<0.00002	<0.000020	<0.000020
Chromium	mg/L	0.05	<0.0010	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Cobalt	mg/L	-	0.00069	0.00062	<0.00030	0.00039	<0.00030	<0.00030	<0.00030	
Copper	mg/L	0.007	0.0013	0.0021	0.00044	0.00085	<0.00020	0.00041	0.00098	0.0005
Lead	mg/L	0.001-0.007 [2]	<0.00020	0.00022	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Lithium	mg/L	-	-	-	0.13	0.14	-	-	0.14	
Manganese	mg/L	0.05	-	-	0.029	<0.0040	0.019	0.023	0.019	0.027
Mercury	mg/L	0.000005	*<0.000010*	<0.0000050	<0.0000050	<0.0000020	<0.0000020	<0.000002	<0.0000020	<0.0000019
Molybdenum	mg/L	-	0.0035	0.0026	0.0021	0.0017	0.0016	0.0023	0.0014	
Nickel	mg/L	0.007-0.170 [2]	0.0027	0.0024	0.0014	0.0018	0.00082	0.00079	0.00086	-
Phosphorus	mg/L	-	-	-	<0.10	0.12	<0.1	-	<0.10	
Selenium	mg/L	0.002	-	-	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Silicon	mg/L	-	-	-	3.6	3.3	4	-	3.9	
Silver	mg/L	0.0001	-	-	<0.00010	<0.00010	<0.0001	<0.00010	<0.00010	<0.00010
Strontium	mg/L	-	-	-	0.29	0.31	0.31	-	0.30	
Sulphur	mg/L	-	-	-	330	300	340	-	320	
Thallium	mg/L	-	-	-	<0.00020	<0.00020	<0.0002	-	<0.00020	
Tin	mg/L	-	-	-	<0.0010	<0.0010	<0.001	-	<0.0010	
Titanium	mg/L	-	-	-	<0.0010	<0.0010	<0.001	-	<0.0010	
Uranium	mg/L	0.01	-	-	0.00056	0.00031	0.00025	0.00051	0.00031	0.00039
Vanadium	mg/L	-	-	-	<0.0010	0.0029	0.0016	-	<0.0010	
Zinc	mg/L	0.03	<0.0030	0.0039	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.003

Notes:

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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	Jun-18	Jun-19	Jun-20
Volatile Organic Compounds (VOCs)										
Bromodichloromethane	mg/L	-	-	-	-	-	-	-	<0.00050	
Bromoform	mg/L	-	-	-	-	-	-	-	<0.00050	
Bromomethane	mg/L	-	-	-	-	-	-	-	<0.0020	
Carbon tetrachloride	mg/L	0.002	-	-	-	-	-	-	<0.00050	<0.00050
Chlorobenzene	mg/L	0.0013	-	-	-	-	-	-	<0.00050	<0.00050
Chloroethane	mg/L	-	-	-	-	-	-	-	<0.0010	
Chloroform	mg/L	0.08	-	-	-	-	-	-	<0.00050	<0.00050
Chloromethane	mg/L	-	-	-	-	-	-	-	<0.0020	
Dibromochloromethane	mg/L	0.1	-	-	-	-	-	-	<0.0010	<0.0010
1,2-Dibromoethane	mg/L	-	-	-	-	-	-	-	<0.00020	
1,2-Dichlorobenzene	mg/L	0.0007	-	-	-	-	-	-	<0.00050	<0.00050
1,3-Dichlorobenzene	mg/L	-	-	-	-	-	-	-	<0.00050	
1,4-Dichlorobenzene	mg/L	0.001	-	-	-	-	-	-	<0.00050	<0.00050
1,1-Dichloroethane	mg/L	-	-	-	-	-	-	-	<0.00050	
1,2-Dichloroethane	mg/L	0.005	-	-	-	-	-	-	<0.00050	<0.00050
1,1-Dichloroethene	mg/L	0.014	-	-	-	-	-	-	<0.00050	<0.00050
1,2-Dichloroethene (cis)	mg/L	-	-	-	-	-	-	-	<0.00050	
1,2-Dichloroethene (trans)	mg/L	-	-	-	-	-	-	-	<0.00050	
1,2-Dichloropropane	mg/L	-	-	-	-	-	-	-	<0.00050	
1,3-Dichloropropene [cis]	mg/L	-	-	-	-	-	-	-	<0.00050	
1,3-Dichloropropene [trans]	mg/L	-	-	-	-	-	-	-	<0.00050	
Methyl t-Butyl Ether (MTBE)	mg/L	0.015	-	-	-	-	-	-	<0.00050	<0.00050
Methylene Chloride	mg/L	0.05	-	-	-	-	-	-	<0.0020	<0.0020
Methyl Methacrylate	mg/L	0.47	-	-	-	-	-	-	<0.00050	<0.00050
Styrene	mg/L	-	-	-	-	-	-	-	<0.00050	
1,1,1,2-Tetrachloroethane	mg/L	-	-	-	-	-	-	-	<0.0010	
1,1,2,2-Tetrachloroethane	mg/L	-	-	-	-	-	-	-	<0.0020	
Tetrachloroethene	mg/L	0.01	-	-	-	-	-	-	<0.00050	<0.00050
1,2,3-Trichlorobenzene	mg/L	0.008	-	-	-	-	-	-	<0.0010	<0.0010
1,2,4-Trichlorobenzene	mg/L	0.015	-	-	-	-	-	-	<0.0010	<0.0010
1,3,5-Trichlorobenzene	mg/L	0.014	-	-	-	-	-	-	<0.00050	<0.00050
1,1,1-Trichloroethane	mg/L	-	-	-	-	-	-	-	<0.00050	
1,1,2-Trichloroethane	mg/L	-	-	-	-	-	-	-	<0.00050	
Trichloroethene	mg/L	0.005	-	-	-	-	-	-	<0.00050	<0.00050
Trichlorofluoromethane	mg/L	-	-	-	-	-	-	-	<0.00050	
Trihalomethanes	mg/L	-	-	-	-	-	-	-	<0.0013	<0.0013
1,2,4-Trimethylbenzene	mg/L	-	-	-	-	-	-	-	<0.00050	
1,3,5-Trimethylbenzene	mg/L	-	-	-	-	-	-	-	<0.00050	
Vinyl chloride	mg/L	0.002	-	-	-	-	-	-	<0.00050	<0.00050

Notes:

[1] Alberta Environment and Parks (AEP). 2019. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. 198 pp. Referenced guidelines are for fine textured soils under Agricultural land use

[2] Guideline varies with hardness
[3] Guideline varies with chloride
[4] Guideline varies with pH and temperature
[5] Guideline varies with pH
"-" No applicable guideline or not analyzed
Equipment Failure, parameter not reported (EF)
Detection limit adjusted (*)
Exceeds Regulatory Limit
Italic - Detection limit greater than Tier 1 Guideline

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	Jun-18	Jun-19	Jun-20
Field Measurements										
Field pH	-	-	7.55	7.4	7.8	7.58	7.5	7.3	7.46	7.45
Field EC	mS	-	11.63	12.78	13.02	12.86	13	14	12.49	12.83
Field Temperature	°C	-	9.1	6.5	7.2	7.8	6.2	7.4	9.5	7.1
Routine Water										
pH	-	6.5 - 8.5	8.07	8.08	7.9	8.14	8.08	7.86	8.11	8.1
Conductivity (EC)	µS/cm	1000	12000	12000	12,000	13,000	12,000	13,000	13,000	13,000
Calcium	mg/L	-	210	230	220	210	220	230	240	240
Magnesium	mg/L	-	60	89	95	93	100	110	120	100
Sodium	mg/L	200	2700	3200	3000	2800	3200	3300	3600	3500
Potassium	mg/L	-	9.4	11	13	13	12	12	13	12
Iron	mg/L	0.3	<0.060	<0.60	<0.60	<0.060	<0.60	<0.60	*<0.60*	<0.60
Sulphate	mg/L	128-429 [2]	6500	6900	6500	6700	5700	6500	6200	6600
Chloride	mg/L	100	34	37	35	33	30	28	27	27
Bicarbonate	mg/L	-	1000	1100	1100	1000	1100	1000	1000	960
Carbonate	mg/L	-	<0.5	<0.50	<0.50	<0.50	<0.50	<1.0	<1.0	<1.0
Hydroxide	mg/L	-	-	-	<0.50	<0.50	<0.5	<1.0	<1.0	<1.0
Nitrate (N)	mg/L	3	0.16	0.075	0.24	0.31	<0.22	0.39	<0.010	0.36
Nitrite (N)	mg/L	0.02 - 0.20 [3]	-	-	0.094	0.038	0.38	0.043	0.038	0.026
Nitrate and Nitrate (N)	mg/L	-	-	-	0.34	0.35	-	0.43	0.038	1.9
Total Dissolved Solids (TDS)	mg/L	500	10,000	11,000	10,000	10,000	9,700	11,000	11,000	11,000
Hardness	mg/L	-	-	-	940	920	960	1000	1100	1000
Alkalinity (total as CaCO3)	mg/L	-	-	-	900	840	870	860	840	790
Alkalinity (pp as CaCO3)	mg/L	-	-	-	<0.50	<0.50	<0.5	-	<1.0	
Ionic Balance	N/A	-	-	-	0.95	0.91	7.3	3.5	9.8	5.3
Water Nutrients										
Ammonia-N	mg/L	0.018-190 [4]	2	1.6	1.2	1.4	1.6	1.1	1.1	1.5
TKN	mg/L	-	2.8	2.5	2.0	2.1	2.1	1.7	2.0	1.9
Hydrocarbons										
Benzene	mg/L	0.005	<0.00040	<0.00040	<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	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	<0.00040	<0.00040	<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	<0.00089	<0.00089	<0.00089
F1 (C6-C10)	mg/L	2.2	<0.10	<0.10	<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	<0.10	<0.10
Organics										
COD	mg/L	-	45	61	45	48	35	37	45	41
TOC	mg/L	-	-	-	-	-	-	-	-	
DOC	mg/L	-	19	15	16	17	17	14	15	14
Oil & Grease	mg/L	-	-	-	-	-	-	-	-	
Metals										
Aluminum	mg/L	0.0007 / 0.05 [5]	-	-	<0.060	0.011	0.0039	<0.003	<0.0030	<0.0030
Antimony	mg/L	0.006	0.00091	<0.012	<0.012	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic	mg/L	0.005	-	-	<0.0040	0.00044	0.0004	0.00038	0.00030	0.00026
Barium	mg/L	1	0.033	<0.10	<0.10	0.010	<0.10	<0.10	<0.10	0.014
Beryllium	mg/L	-	-	-	<0.020	<0.0010	<0.001	-	<0.0010	
Boron	mg/L	1	-	-	0.44	0.45	0.44	0.44	0.52	0.39
Cadmium	mg/L	0.00004-0.00037 [2]	0.00027	<0.00010	<0.00040	0.000034	0.000022	0.000024	0.000027	<0.000020
Chromium	mg/L	0.05	<0.0010	<0.020	<0.020	0.0012	<0.0010	<0.0010	<0.0010	<0.0010
Cobalt	mg/L	-	0.0051	<0.0060	<0.0060	0.0019	0.0015	0.0014	0.0013	
Copper	mg/L	0.007	0.0021	<0.0040	<0.0040	0.0015	0.00033	0.00064	0.0014	0.0013
Lead	mg/L	0.001-0.007 [2]	<0.00020	<0.0040	<0.0040	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Lithium	mg/L	-	-	-	0.58	0.61	-	-	0.70	
Manganese	mg/L	0.05	-	-	0.27	0.25	0.25	0.25	0.25	0.31
Mercury	mg/L	0.000005	*<0.000010*	<0.0000050	<0.0000050	<0.0000020	<0.0000020	0.0000022	<0.0000020	<0.0000019
Molybdenum	mg/L	-	0.0029	<0.0040	<0.0040	0.0009	0.00078	0.00087	0.00054	0.00059
Nickel	mg/L	0.007-0.170 [2]	0.012	<0.010	<0.010	0.0049	0.0038	0.0034	0.0032	0.0032
Phosphorus	mg/L	-	-	-	<1.0	<0.10	<1	-	<1.0	
Selenium	mg/L	0.002	-	-	*<0.0040*	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Silicon	mg/L	-	-	-	4.8	4.8	4.7	-	5.4	
Silver	mg/L	0.0001	-	-	<0.0020	<0.00010	<0.0001	<0.0001	<0.00010	<0.00010
Strontium	mg/L	-	-	-	5.0	4.7	5.4	-	6.4	
Sulphur	mg/L	-	-	-	2100	2200	2200	-	2500	
Thallium	mg/L	-	-	-	<0.0040	<0.00020	<0.0002	-	<0.00020	
Tin	mg/L	-	-	-	<0.020	<0.0010	<0.001	-	<0.0010	
Titanium	mg/L	-	-	-	<0.020	<0.0010	<0.001	-	<0.0010	
Uranium	mg/L	0.01	-	-	<0.0020	0.00062	0.00054	0.00047	0.00045	0.00056
Vanadium	mg/L	-	-	-	<0.020	0.0013	<0.001	-	<0.0010	
Zinc	mg/L	0.03	0.0037	<0.060	<0.060	0.0052	<0.0030	<0.0030	<0.0030	<0.0030

Notes:

[1] Alberta Environment and Parks (AEP). 2019. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. 198 pp. Referenced guidelines are for fine textured soils under Agricultural land use

[2] Guideline varies with hardness

[3] Guideline varies with chloride

[4] Guideline varies with pH and temperature

[5] Guideline varies with pH

"-" No applicable guideline or not analyzed

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Italic - Detection limit greater than Tier 1 Guideline

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	Jun-18	Jun-19	Jun-20
Volatile Organic Compounds (VOCs)										
Bromodichloromethane	mg/L	-	-	-	-	-	-	-	<0.00050	
Bromoform	mg/L	-	-	-	-	-	-	-	<0.00050	
Bromomethane	mg/L	-	-	-	-	-	-	-	<0.0020	
Carbon tetrachloride	mg/L	0.002	-	-	-	-	-	-	<0.00050	<0.00050
Chlorobenzene	mg/L	0.0013	-	-	-	-	-	-	<0.00050	<0.00050
Chloroethane	mg/L	-	-	-	-	-	-	-	<0.0010	
Chloroform	mg/L	0.08	-	-	-	-	-	-	<0.00050	<0.00050
Chloromethane	mg/L	-	-	-	-	-	-	-	<0.0020	
Dibromochloromethane	mg/L	0.1	-	-	-	-	-	-	<0.0010	<0.0010
1,2-Dibromoethane	mg/L	-	-	-	-	-	-	-	<0.00020	
1,2-Dichlorobenzene	mg/L	0.0007	-	-	-	-	-	-	<0.00050	<0.00050
1,3-Dichlorobenzene	mg/L	-	-	-	-	-	-	-	<0.00050	
1,4-Dichlorobenzene	mg/L	0.001	-	-	-	-	-	-	<0.00050	<0.00050
1,1-Dichloroethane	mg/L	-	-	-	-	-	-	-	<0.00050	
1,2-Dichloroethane	mg/L	0.005	-	-	-	-	-	-	<0.00050	<0.00050
1,1-Dichloroethene	mg/L	0.014	-	-	-	-	-	-	<0.00050	<0.00050
1,2-Dichloroethene (cis)	mg/L	-	-	-	-	-	-	-	<0.00050	
1,2-Dichloroethene (trans)	mg/L	-	-	-	-	-	-	-	<0.00050	
1,2-Dichloropropane	mg/L	-	-	-	-	-	-	-	<0.00050	
1,3-Dichloropropene [cis]	mg/L	-	-	-	-	-	-	-	<0.00050	
1,3-Dichloropropene [trans]	mg/L	-	-	-	-	-	-	-	<0.00050	
Methyl t-Butyl Ether (MTBE)	mg/L	0.015	-	-	-	-	-	-	<0.00050	<0.00050
Methylene Chloride	mg/L	0.05	-	-	-	-	-	-	<0.0020	<0.0020
Methyl Methacrylate	mg/L	0.47	-	-	-	-	-	-	<0.00050	<0.00050
Styrene	mg/L	-	-	-	-	-	-	-	<0.00050	
1,1,1,2-Tetrachloroethane	mg/L	-	-	-	-	-	-	-	<0.0010	
1,1,2,2-Tetrachloroethane	mg/L	-	-	-	-	-	-	-	<0.0020	
Tetrachloroethene	mg/L	0.01	-	-	-	-	-	-	<0.00050	<0.00050
1,2,3-Trichlorobenzene	mg/L	0.008	-	-	-	-	-	-	<0.0010	<0.0010
1,2,4-Trichlorobenzene	mg/L	0.015	-	-	-	-	-	-	<0.0010	<0.0010
1,3,5-Trichlorobenzene	mg/L	0.014	-	-	-	-	-	-	<0.00050	<0.00050
1,1,1-Trichloroethane	mg/L	-	-	-	-	-	-	-	<0.00050	
1,1,2-Trichloroethane	mg/L	-	-	-	-	-	-	-	<0.00050	
Trichloroethene	mg/L	0.005	-	-	-	-	-	-	<0.00050	<0.00050
Trichlorofluoromethane	mg/L	-	-	-	-	-	-	-	<0.00050	
Trihalomethanes	mg/L	-	-	-	-	-	-	-	<0.0013	<0.0013
1,2,4-Trimethylbenzene	mg/L	-	-	-	-	-	-	-	<0.00050	
1,3,5-Trimethylbenzene	mg/L	-	-	-	-	-	-	-	<0.00050	
Vinyl chloride	mg/L	0.002	-	-	-	-	-	-	<0.00050	<0.00050

Notes:

[1] Alberta Environment and Parks (AEP). 2019. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. 198 pp. Referenced guidelines are for fine textured soils under Agricultural land use

[2] Guideline varies with hardness
[3] Guideline varies with chloride
[4] Guideline varies with pH and temperature
[5] Guideline varies with pH
"-" No applicable guideline or not analyzed
Equipment Failure, parameter not reported (EF)
Detection limit adjusted (*)
Exceeds Regulatory Limit
Italic - Detection limit greater than Tier 1 Guideline

Table E29A: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 29A					
			Jun-15	Jun-16	Jun-17	Jun-18	Jun-19	Jun-20
Field Measurements								
Field pH	-	-	8.5	8.15	8.1	7.48	8.06	7.89
Field EC	mS	-	4.74	3.44	3.74	3.44	3.76	3.56
Field Temperature	°C	-	6.7	7.0	6.5	8.4	8.8	6.8
Routine Water								
pH	-	6.5 - 8.5	8.28	8.41	8.34	8.33	8.45	8.13
Conductivity (EC)	µS/cm	1000	4900	3400	3400	3400	3500	3500
Calcium	mg/L	-	72	33	32	30	32	37
Magnesium	mg/L	-	9.9	5.1	5.2	4.8	5.1	7.3
Sodium	mg/L	200	1200	810	810	850	810	840
Potassium	mg/L	-	7.4	4.1	4.1	3.8	3.7	3.9
Iron	mg/L	0.3	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060
Sulphate	mg/L	128-429 [2]	2000	1200	1100	1100	1100	1200
Chloride	mg/L	100	7.3	3.3	3.6	3.2	3.5	3.6
Bicarbonate	mg/L	-	680	710	760	770	740	760
Carbonate	mg/L	-	<0.50	7.7	3	4.2	16	<1.0
Hydroxide	mg/L	-	<0.50	<0.50	<0.50	<1.0	<1.0	<1.0
Nitrate (N)	mg/L	3	0.054	0.063	0.33	0.32	0.18	0.24
Nitrite (N)	mg/L	0.02 - 0.20 [3]	0.084	0.014	1.1	0.026	0.089	0.08
Nitrate and Nitrate (N)	mg/L	-	0.14	0.077	-	0.35	0.27	0.32
Total Dissolved Solids (TDS)	mg/L	500	3600	2400	2400	2400	2300	2400
Hardness	mg/L	-	220	100	100	95	100	120
Alkalinity (total as CaCO3)	mg/L	-	560	590	630	640	630	620
Alkalinity (pp as CaCO3)	mg/L	-	<0.50	6.4	2.5	-	13	
Ionic Balance	N/A	-	1.0	1.0	2	3.6	2.7	2.8
Water Nutrients								
Ammonia-N	mg/L	0.018-190 [4]	4.3	1.2	1.4	0.9	1.1	1.1
TKN	mg/L	-	16	1.3	1.6	1.3	1.7	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	<0.00089	<0.00089	<0.00089
F1 (C6-C10)	mg/L	2.2	<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	-	1100	55	25	22	58	22
TOC	mg/L	-	-	-	-	-	-	
DOC	mg/L	-	13	8.3	9.1	7.7	9.1	8.1
Oil & Grease	mg/L	-	-	-	-	-	-	
Metals								
Aluminum	mg/L	0.0007 / 0.05 [5]	0.0048	0.0067	0.0079	0.0042	0.012	0.0057
Antimony	mg/L	0.006	0.0012	<0.00060	0.23	<0.00060	<0.00060	<0.00060
Arsenic	mg/L	0.005	0.0030	0.0011	0.00093	0.00076	0.00072	0.00071
Barium	mg/L	1	0.021	0.015	0.018	0.014	0.014	0.014
Beryllium	mg/L	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	
Boron	mg/L	1	0.50	0.75	0.74	0.72	0.72	0.71
Cadmium	mg/L	0.00004-0.00037 [2]	<0.000020	<0.000020	<0.000020	<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	-	0.00044	0.00061	0.00046	<0.00030	0.00034	
Copper	mg/L	0.007	0.0012	0.0020	0.00093	0.00098	0.0031	0.0049
Lead	mg/L	0.001-0.007 [2]	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Lithium	mg/L	-	0.26	0.22	0.23	0.22	0.21	
Manganese	mg/L	0.05	0.081	0.064	0.06	0.051	0.050	0.059
Mercury	mg/L	0.000005	<0.0000050	<0.0000020	<0.000002	0.0000028	<0.0000020	<0.0000019
Molybdenum	mg/L	-	0.0091	0.0017	0.0019	0.0016	0.0015	0.0018
Nickel	mg/L	0.007-0.170 [2]	0.0036	0.0020	0.0014	0.0011	0.0013	0.0013
Phosphorus	mg/L	-	<0.10	<0.10	<0.10	<0.10	<0.10	
Selenium	mg/L	0.002	0.00039	0.00022	0.00027	0.00023	<0.00020	<0.00020
Silicon	mg/L	-	1.7	3.6	3.7	3.6	3.8	
Silver	mg/L	0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Strontium	mg/L	-	1.4	0.67	0.68	0.66	0.66	
Sulphur	mg/L	-	740	400	390	370	360	
Thallium	mg/L	-	<0.00020	<0.00020	<0.00020	<0.0002	<0.00020	
Tin	mg/L	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	
Titanium	mg/L	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	
Uranium	mg/L	0.01	0.0093	0.0006	0.00055	0.00043	0.00047	0.00066
Vanadium	mg/L	-	<0.0010	0.0011	<0.0010	<0.0010	<0.0010	
Zinc	mg/L	0.03	<0.0030	<0.0030	<0.0030	<0.0030	0.0032	<0.0030

Notes:

[1] Alberta Environment and Parks (AEP). 2019. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. 198 pp. Referenced guidelines are for fine textured soils under Agricultural land use

[2] Guideline varies with hardness

[3] Guideline varies with chloride

[4] Guideline varies with pH and temperature

[5] Guideline varies with pH

"-" No applicable guideline or not analyzed

Total Dissolved Solids, not a measured value (TDS)

Exceeds Regulatory Limit

Italic - Detection limit greater than Tier 1 Guideline

Table E29A: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 29A					
			Jun-15	Jun-16	Jun-17	Jun-18	Jun-19	Jun-20
Volatile Organic Compounds (VOCs)								
Bromodichloromethane	mg/L	-	-	-	-	-	<0.00050	
Bromoform	mg/L	-	-	-	-	-	<0.00050	
Bromomethane	mg/L	-	-	-	-	-	<0.0020	
Carbon tetrachloride	mg/L	0.002	-	-	-	-	<0.00050	<0.00050
Chlorobenzene	mg/L	0.0013	-	-	-	-	<0.00050	<0.00050
Chloroethane	mg/L	-	-	-	-	-	<0.0010	
Chloroform	mg/L	0.08	-	-	-	-	<0.00050	<0.00050
Chloromethane	mg/L	-	-	-	-	-	<0.0020	
Dibromochloromethane	mg/L	0.1	-	-	-	-	<0.0010	<0.0010
1,2-Dibromoethane	mg/L	-	-	-	-	-	<0.00020	
1,2-Dichlorobenzene	mg/L	0.0007	-	-	-	-	<0.00050	<0.00050
1,3-Dichlorobenzene	mg/L	-	-	-	-	-	<0.00050	
1,4-Dichlorobenzene	mg/L	0.001	-	-	-	-	<0.00050	<0.00050
1,1-Dichloroethane	mg/L	-	-	-	-	-	<0.00050	
1,2-Dichloroethane	mg/L	0.005	-	-	-	-	<0.00050	<0.00050
1,1-Dichloroethene	mg/L	0.014	-	-	-	-	<0.00050	<0.00050
1,2-Dichloroethene (cis)	mg/L	-	-	-	-	-	<0.00050	
1,2-Dichloroethene (trans)	mg/L	-	-	-	-	-	<0.00050	
1,2-Dichloropropane	mg/L	-	-	-	-	-	<0.00050	
1,3-Dichloropropene [cis]	mg/L	-	-	-	-	-	<0.00050	
1,3-Dichloropropene [trans]	mg/L	-	-	-	-	-	<0.00050	
Methyl t-Butyl Ether (MTBE)	mg/L	0.015	-	-	-	-	<0.00050	<0.00050
Methylene Chloride	mg/L	0.05	-	-	-	-	<0.0020	<0.0020
Methyl Methacrylate	mg/L	0.47	-	-	-	-	<0.00050	<0.00050
Styrene	mg/L	-	-	-	-	-	<0.00050	
1,1,1,2-Tetrachloroethane	mg/L	-	-	-	-	-	<0.0010	
1,1,2,2-Tetrachloroethane	mg/L	-	-	-	-	-	<0.0020	
Tetrachloroethene	mg/L	0.01	-	-	-	-	<0.00050	<0.00050
1,2,3-Trichlorobenzene	mg/L	0.008	-	-	-	-	<0.0010	<0.0010
1,2,4-Trichlorobenzene	mg/L	0.015	-	-	-	-	<0.0010	<0.0010
1,3,5-Trichlorobenzene	mg/L	0.014	-	-	-	-	<0.00050	<0.00050
1,1,1-Trichloroethane	mg/L	-	-	-	-	-	<0.00050	
1,1,2-Trichloroethane	mg/L	-	-	-	-	-	<0.00050	
Trichloroethene	mg/L	0.005	-	-	-	-	<0.00050	<0.00050
Trichlorofluoromethane	mg/L	-	-	-	-	-	<0.00050	
Trihalomethanes	mg/L	-	-	-	-	-	<0.0013	<0.0013
1,2,4-Trimethylbenzene	mg/L	-	-	-	-	-	<0.00050	
1,3,5-Trimethylbenzene	mg/L	-	-	-	-	-	<0.00050	
Vinyl chloride	mg/L	0.002	-	-	-	-	<0.00050	<0.00050

Notes:

[1] Alberta Environment and Parks (AEP). 2019. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. 198 pp. Referenced guidelines are for fine textured soils under Agricultural land use

[2] Guideline varies with hardness

[3] Guideline varies with chloride

[4] Guideline varies with pH and temperature

[5] Guideline varies with pH

"-" No applicable guideline or not analyzed

Total Dissolved Solids, not a measured value (TDS)

Exceeds Regulatory Limit

Italic - Detection limit greater than Tier 1 Guideline

Table E29B: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 29B					
			Jun-15	Jun-16	Jun-17	Jun-18	Jun-19	Jun-20
Field Measurements								
Field pH	-	-	7.4	7.21	7.2	6.9	7.20	7.18
Field EC	mS	-	8.67	8.80	9.23	8.62	8.7	8.84
Field Temperature	°C	-	7.1	7.7	6	9	9.1	7.8
Routine Water								
pH	-	6.5 - 8.5	7.62	7.85	7.9	7.76	7.88	7.34
Conductivity (EC)	µS/cm	1000	8200	8400	8500	8600	8900	8700
Calcium	mg/L	-	520	560	530	530	440	440
Magnesium	mg/L	-	260	230	240	260	260	260
Sodium	mg/L	200	1400	1600	1600	1700	1700	1900
Potassium	mg/L	-	12	11	11	12	10	11
Iron	mg/L	0.3	<0.60	0.54	<0.60	<0.60	*<0.60*	*<0.60*
Sulphate	mg/L	128-429 [2]	4700	5100	4700	5000	4900	5000
Chloride	mg/L	100	5.7	5.2	6	6.3	8.2	8.6
Bicarbonate	mg/L	-	570	520	550	560	570	570
Carbonate	mg/L	-	<0.50	<0.50	0<0.5	<1.0	<1.0	<1.0
Hydroxide	mg/L	-	<0.50	<0.50	<0.50	<1.0	<1.0	<1.0
Nitrate (N)	mg/L	3	0.39	0.11	<0.22	0.13	<0.010	0.53
Nitrite (N)	mg/L	0.02 - 0.20 [3]	0.027	0.025	<0.16	0.032	0.079	0.059
Nitrate and Nitrate (N)	mg/L	-	0.42	0.13	-	0.17	0.079	0.59
Total Dissolved Solids (TDS)	mg/L	500	7200	7700	7400	7800	7600	7900
Hardness	mg/L	-	2300	2400	2300	2400	2200	2200
Alkalinity (total as CaCO3)	mg/L	-	470	420	450	460	470	470
Alkalinity (pp as CaCO3)	mg/L	-	<0.50	<0.50	<0.50	-	<1.0	
Ionic Balance	N/A	-	1.0	1.0	4.6	3.5	1.7	4.3
Water Nutrients								
Ammonia-N	mg/L	0.018-190 [4]	0.72	1.1	1.4	1.2	0.91	0.81
TKN	mg/L	-	4.5	0.96	1.8	1.9	1.5	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	<0.00089	<0.00089	<0.00089
F1 (C6-C10)	mg/L	2.2	<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	-	150	41	45	76	56	34
TOC	mg/L	-	-	-	-	-	-	
DOC	mg/L	-	17	15	18	14	17	15
Oil & Grease	mg/L	-	-	-	-	-	-	
Metals								
Aluminum	mg/L	0.0007 / 0.05 [5]	0.0041	0.022	0.01	0.0049	<0.0030	<0.0030
Antimony	mg/L	0.006	0.0017	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic	mg/L	0.005	0.0077	0.00054	0.00031	0.00035	<0.00020	0.00037
Barium	mg/L	1	<0.10	0.019	<0.10	<0.10	<0.10	0.1
Beryllium	mg/L	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	
Boron	mg/L	1	<0.20	0.20	0.21	<0.20	0.20	0.19
Cadmium	mg/L	0.00004-0.00037 [2]	0.00017	0.000082	0.00006	0.000057	0.000058	0.000046
Chromium	mg/L	0.05	<0.0010	0.0014	<0.0010	<0.0010	<0.0010	<0.0010
Cobalt	mg/L	-	0.018	0.0056	0.0044	0.0041	0.0032	
Copper	mg/L	0.007	0.0019	0.0019	0.00098	0.0009	0.0014	0.00055
Lead	mg/L	0.001-0.007 [2]	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Lithium	mg/L	-	0.55	0.65	0.67	0.68	0.61	
Manganese	mg/L	0.05	0.77	0.85	0.88	0.96	0.80	0.81
Mercury	mg/L	0.000005	<0.0000050	0.0000043	<0.0000020	0.0000036	<0.0000020	<0.0000019
Molybdenum	mg/L	-	0.016	0.00045	0.00057	0.00043	0.00030	
Nickel	mg/L	0.007-0.170 [2]	0.048	0.0099	0.0075	0.0075	0.0055	0.0053
Phosphorus	mg/L	-	<1.0	<0.10	<1.0	<1.0	<1.0	
Selenium	mg/L	0.002	0.001	<0.00020	<0.00020	0.0002	<0.00020	<0.00020
Silicon	mg/L	-	4.4	5.3	5.6	5.4	5.2	
Silver	mg/L	0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Strontium	mg/L	-	6.9	7.9	8	8.2	8.6	
Sulphur	mg/L	-	1600	1800	1700	1800	1700	
Thallium	mg/L	-	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	
Tin	mg/L	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	
Titanium	mg/L	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	
Uranium	mg/L	0.01	0.019	0.0042	0.0061	0.0049	0.0042	0.005
Vanadium	mg/L	-	<0.0010	0.0015	<0.0010	<0.0010	<0.0010	
Zinc	mg/L	0.03	0.014	0.0051	<0.0030	<0.0030	<0.0030	<0.0030

Notes:

[1] Alberta Environment and Parks (AEP). 2019. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. 198 pp. Referenced guidelines are for fine textured soils under Agricultural land use

[2] Guideline varies with hardness

[3] Guideline varies with chloride

[4] Guideline varies with pH and temperature

[5] Guideline varies with pH

"-" No applicable guideline or not analyzed

Exceeds Regulatory Limit

Italic - Detection limit greater than Tier 1 Guideline

Table E29B: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 29B					
			Jun-15	Jun-16	Jun-17	Jun-18	Jun-19	Jun-20
Volatile Organic Compounds (VOCs)								
Bromodichloromethane	mg/L	-	-	-	-	-	<0.00050	
Bromoform	mg/L	-	-	-	-	-	<0.00050	
Bromomethane	mg/L	-	-	-	-	-	<0.0020	
Carbon tetrachloride	mg/L	0.002	-	-	-	-	<0.00050	<0.00050
Chlorobenzene	mg/L	0.0013	-	-	-	-	<0.00050	<0.00050
Chloroethane	mg/L	-	-	-	-	-	<0.0010	
Chloroform	mg/L	0.08	-	-	-	-	<0.00050	<0.00050
Chloromethane	mg/L	-	-	-	-	-	<0.0020	
Dibromochloromethane	mg/L	0.1	-	-	-	-	<0.0010	<0.0010
1,2-Dibromoethane	mg/L	-	-	-	-	-	<0.00020	
1,2-Dichlorobenzene	mg/L	0.0007	-	-	-	-	<0.00050	<0.00050
1,3-Dichlorobenzene	mg/L	-	-	-	-	-	<0.00050	
1,4-Dichlorobenzene	mg/L	0.001	-	-	-	-	<0.00050	<0.00050
1,1-Dichloroethane	mg/L	-	-	-	-	-	<0.00050	
1,2-Dichloroethane	mg/L	0.005	-	-	-	-	<0.00050	<0.00050
1,1-Dichloroethene	mg/L	0.014	-	-	-	-	<0.00050	<0.00050
1,2-Dichloroethene (cis)	mg/L	-	-	-	-	-	<0.00050	
1,2-Dichloroethene (trans)	mg/L	-	-	-	-	-	<0.00050	
1,2-Dichloropropane	mg/L	-	-	-	-	-	<0.00050	
1,3-Dichloropropene [cis]	mg/L	-	-	-	-	-	<0.00050	
1,3-Dichloropropene [trans]	mg/L	-	-	-	-	-	<0.00050	
Methyl t-Butyl Ether (MTBE)	mg/L	0.015	-	-	-	-	<0.00050	<0.00050
Methylene Chloride	mg/L	0.05	-	-	-	-	<0.0020	<0.0020
Methyl Methacrylate	mg/L	0.47	-	-	-	-	<0.00050	<0.00050
Styrene	mg/L	-	-	-	-	-	<0.00050	
1,1,1,2-Tetrachloroethane	mg/L	-	-	-	-	-	<0.0010	
1,1,2,2-Tetrachloroethane	mg/L	-	-	-	-	-	<0.0020	
Tetrachloroethene	mg/L	0.01	-	-	-	-	<0.00050	<0.00050
1,2,3-Trichlorobenzene	mg/L	0.008	-	-	-	-	<0.0010	<0.0010
1,2,4-Trichlorobenzene	mg/L	0.015	-	-	-	-	<0.0010	<0.0010
1,3,5-Trichlorobenzene	mg/L	0.014	-	-	-	-	<0.00050	<0.00050
1,1,1-Trichloroethane	mg/L	-	-	-	-	-	<0.00050	
1,1,2-Trichloroethane	mg/L	-	-	-	-	-	<0.00050	
Trichloroethene	mg/L	0.005	-	-	-	-	<0.00050	<0.00050
Trichlorofluoromethane	mg/L	-	-	-	-	-	<0.00050	
Trihalomethanes	mg/L	-	-	-	-	-	<0.0013	<0.0013
1,2,4-Trimethylbenzene	mg/L	-	-	-	-	-	<0.00050	
1,3,5-Trimethylbenzene	mg/L	-	-	-	-	-	<0.00050	
Vinyl chloride	mg/L	0.002	-	-	-	-	<0.00050	<0.00050

Notes:

[1] Alberta Environment and Parks (AEP). 2019. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. 198 pp. Referenced guidelines are for fine textured soils under Agricultural land use

[2] Guideline varies with hardness

[3] Guideline varies with chloride

[4] Guideline varies with pH and temperature

[5] Guideline varies with pH

"-" No applicable guideline or not analyzed

Exceeds Regulatory Limit

Italic - Detection limit greater than Tier 1 Guideline

Table E30A: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 30A					
			Jun-15	Jun-16	Jun-17	Jun-18	Jun-19	May-20
Field Measurements								
Field pH	-	-	8.5	8.29	8.2	7.98	8.19	8.08
Field EC	mS	-	2.40	2.32	2.02	1.932	2.18	1.94
Field Temperature	°C	-	7.5	8.7	7	8.4	10.1	6.9
Routine Water								
pH	-	6.5 - 8.5	8.34	8.37	8.57	8.44	8.53	8.4
Conductivity (EC)	µS/cm	1000	2300	2200	1900	1900	2000	2000
Calcium	mg/L	-	16	12	8.9	7.9	8.3	8.8
Magnesium	mg/L	-	2.2	1.6	1.4	1.3	1.4	1.3
Sodium	mg/L	200	540	540	460	450	430	420
Potassium	mg/L	-	2.9	2.4	2.2	2.1	2.0	1.8
Iron	mg/L	0.3	0.44	0.63	<0.06	<0.060	<0.060	<0.060
Sulphate	mg/L	128-429 [2]	510	510	360	350	350	360
Chloride	mg/L	100	5.3	3.0	1.3	1.5	1.3	2.2
Bicarbonate	mg/L	-	770	780	770	770	740	730
Carbonate	mg/L	-	3.5	5.3	17	12	23	7.9
Hydroxide	mg/L	-	<0.50	<0.50	<0.5	<1.0	<1.0	<1.0
Nitrate (N)	mg/L	3	0.013	0.16	0.19	0.1	0.086	0.088
Nitrite (N)	mg/L	0.02 - 0.20 [3]	<0.033	0.046	0.081	<0.010	0.010	0.023
Nitrate and Nitrate (N)	mg/L	-	0.023	0.21	-	0.1	0.096	0.11
Total Dissolved Solids (TDS)	mg/L	500	1500	1500	1200	1200	1200	1200
Hardness	mg/L	-	48	36	28	25	26	27
Alkalinity (total as CaCO3)	mg/L	-	640	650	660	650	640	610
Alkalinity (pp as CaCO3)	mg/L	-	2.9	4.5	14	-	19	
Ionic Balance	N/A	-	1.0	1.0	0.27	0.61	2.4	2.2
Water Nutrients								
Ammonia-N	mg/L	0.018-190 [4]	0.78	0.42	0.46	0.39	0.40	0.40
TKN	mg/L	-	2.6	1.1	0.8	0.75	0.76	0.79
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	<0.00089	<0.00089	<0.00089
F1 (C6-C10)	mg/L	2.2	<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	-	130	43	23	57	24	22
TOC	mg/L	-	-	-	-	-	-	
DOC	mg/L	-	15	9.9	7.8	7.1	8.7	7.3
Oil & Grease	mg/L	-	-	-	-	-	-	
Metals								
Aluminum	mg/L	0.0007 / 0.05 [5]	1.0	3.8	0.011	0.0059	<0.0030	<0.0030
Antimony	mg/L	0.006	0.0008	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic	mg/L	0.005	0.0037	0.0030	0.00089	0.00077	0.00059	0.00066
Barium	mg/L	1	0.028	0.025	0.015	0.013	0.011	0.012
Beryllium	mg/L	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	
Boron	mg/L	1	0.43	0.52	0.40	0.38	0.39	0.37
Cadmium	mg/L	0.00004-0.00037 [2]	0.00004	0.000026	<0.000020	<0.000020	<0.000020	<0.000020
Chromium	mg/L	0.05	0.0016	0.0045	<0.0010	<0.0010	<0.0010	<0.0010
Cobalt	mg/L	-	0.0012	0.0012	<0.00030	<0.0003	<0.00030	
Copper	mg/L	0.007	0.0056	0.0075	0.00034	0.00057	0.00065	0.0005
Lead	mg/L	0.001-0.007 [2]	0.00077	0.00054	<0.00020	<0.00020	<0.00020	<0.00020
Lithium	mg/L	-	0.11	0.13	0.16	0.15	0.14	
Manganese	mg/L	0.05	0.081	0.059	0.018	0.016	0.015	0.015
Mercury	mg/L	0.000005	<0.0000050	<0.0000020	<0.0000020	0.0000025	<0.0000020	<0.0000019
Molybdenum	mg/L	-	0.013	0.0082	0.0015	0.001	0.00080	0.00081
Nickel	mg/L	0.007-0.170 [2]	0.013	0.010	0.0023	0.00065	0.00074	<0.00050
Phosphorus	mg/L	-	<0.10	0.11	0.1	<0.10	<0.10	
Selenium	mg/L	0.002	0.0012	0.00064	<0.00020	<0.00020	<0.00020	<0.00020
Silicon	mg/L	-	3.4	3.7	3.9	3.6	3.9	
Silver	mg/L	0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Strontium	mg/L	-	0.15	0.13	0.14	0.14	0.15	
Sulphur	mg/L	-	190	170	120	120	120	
Thallium	mg/L	-	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	
Tin	mg/L	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	
Titanium	mg/L	-	0.033	0.084	<0.0010	<0.0010	<0.0010	
Uranium	mg/L	0.01	0.0063	0.0035	0.00018	0.00017	0.00011	<0.00010
Vanadium	mg/L	-	0.0034	0.0090	0.011	<0.0010	<0.0010	
Zinc	mg/L	0.03	0.0034	0.0037	<0.0030	<0.0030	<0.0030	<0.0030

Notes:

[1] Alberta Environment and Parks (AEP). 2019. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. 198 pp. Referenced guidelines are for fine textured soils under Agricultural land use

[2] Guideline varies with hardness

[3] Guideline varies with chloride

[4] Guideline varies with pH and temperature

[5] Guideline varies with pH

"-" No applicable guideline or not analyzed

Exceeds Regulatory Limit

Italic - Detection limit greater than Tier 1 Guideline

Table E30A: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 30A					
			Jun-15	Jun-16	Jun-17	Jun-18	Jun-19	May-20
Volatile Organic Compounds (VOCs)								
Bromodichloromethane	mg/L	-	-	-	-	-	<0.00050	
Bromoform	mg/L	-	-	-	-	-	<0.00050	
Bromomethane	mg/L	-	-	-	-	-	<0.0020	
Carbon tetrachloride	mg/L	0.002	-	-	-	-	<0.00050	<0.00050
Chlorobenzene	mg/L	0.0013	-	-	-	-	<0.00050	<0.00050
Chloroethane	mg/L	-	-	-	-	-	<0.0010	
Chloroform	mg/L	0.08	-	-	-	-	<0.00050	<0.00050
Chloromethane	mg/L	-	-	-	-	-	<0.0020	
Dibromochloromethane	mg/L	0.1	-	-	-	-	<0.0010	<0.0010
1,2-Dibromoethane	mg/L	-	-	-	-	-	<0.00020	
1,2-Dichlorobenzene	mg/L	0.0007	-	-	-	-	<0.00050	<0.00050
1,3-Dichlorobenzene	mg/L	-	-	-	-	-	<0.00050	
1,4-Dichlorobenzene	mg/L	0.001	-	-	-	-	<0.00050	<0.00050
1,1-Dichloroethane	mg/L	-	-	-	-	-	<0.00050	
1,2-Dichloroethane	mg/L	0.005	-	-	-	-	<0.00050	<0.00050
1,1-Dichloroethene	mg/L	0.014	-	-	-	-	<0.00050	<0.00050
1,2-Dichloroethene (cis)	mg/L	-	-	-	-	-	<0.00050	
1,2-Dichloroethene (trans)	mg/L	-	-	-	-	-	<0.00050	
1,2-Dichloropropane	mg/L	-	-	-	-	-	<0.00050	
1,3-Dichloropropene [cis]	mg/L	-	-	-	-	-	<0.00050	
1,3-Dichloropropene [trans]	mg/L	-	-	-	-	-	<0.00050	
Methyl t-Butyl Ether (MTBE)	mg/L	0.015	-	-	-	-	<0.00050	<0.00050
Methylene Chloride	mg/L	0.05	-	-	-	-	<0.0020	<0.0020
Methyl Methacrylate	mg/L	0.47	-	-	-	-	<0.00050	<0.00050
Styrene	mg/L	-	-	-	-	-	<0.00050	
1,1,1,2-Tetrachloroethane	mg/L	-	-	-	-	-	<0.0010	
1,1,2,2-Tetrachloroethane	mg/L	-	-	-	-	-	<0.0020	
Tetrachloroethene	mg/L	0.01	-	-	-	-	<0.00050	<0.00050
1,2,3-Trichlorobenzene	mg/L	0.008	-	-	-	-	<0.0010	<0.0010
1,2,4-Trichlorobenzene	mg/L	0.015	-	-	-	-	<0.0010	<0.0010
1,3,5-Trichlorobenzene	mg/L	0.014	-	-	-	-	<0.00050	<0.00050
1,1,1-Trichloroethane	mg/L	-	-	-	-	-	<0.00050	
1,1,2-Trichloroethane	mg/L	-	-	-	-	-	<0.00050	
Trichloroethene	mg/L	0.005	-	-	-	-	<0.00050	<0.00050
Trichlorofluoromethane	mg/L	-	-	-	-	-	<0.00050	
Trihalomethanes	mg/L	-	-	-	-	-	<0.0013	<0.0013
1,2,4-Trimethylbenzene	mg/L	-	-	-	-	-	<0.00050	
1,3,5-Trimethylbenzene	mg/L	-	-	-	-	-	<0.00050	
Vinyl chloride	mg/L	0.002	-	-	-	-	<0.00050	<0.00050

Notes:

[1] Alberta Environment and Parks (AEP). 2019. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. 198 pp. Referenced guidelines are for fine textured soils under Agricultural land use

[2] Guideline varies with hardness

[3] Guideline varies with chloride

[4] Guideline varies with pH and temperature

[5] Guideline varies with pH

"-" No applicable guideline or not analyzed

Exceeds Regulatory Limit

Italic - Detection limit greater than Tier 1 Guideline

Table E30B: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 30B					
			Jun-15	Jun-16	Jun-17	Jun-18	Jun-19	May-20
Field Measurements								
Field pH	-	-	8.1	8.19	7.9	7.28	7.88	7.67
Field EC	mS	-	2.83	2.65	2.68	2.5	2.47	2.53
Field Temperature	°C	-	6.5	7.4	5.6	8.7	8.4	5.9
Routine Water								
pH	-	6.5 - 8.5	8.06	8.44	8.32	8.27	8.26	8.22
Conductivity (EC)	µS/cm	1000	2700	2600	2500	2500	2500	2500
Calcium	mg/L	-	29	26	24	22	22	23
Magnesium	mg/L	-	9.1	9.5	8.9	8	8.1	8.2
Sodium	mg/L	200	680	610	560	610	570	580
Potassium	mg/L	-	3.3	3.2	2.9	2.6	2.6	2.4
Iron	mg/L	0.3	<0.060	<0.060	<0.060	<0.060	0.13	<0.30
Sulphate	mg/L	128-429 [2]	830	830	750	720	690	700
Chloride	mg/L	100	1.4	1.5	1.8	<1.0	1.9	2
Bicarbonate	mg/L	-	670	610	680	710	700	660
Carbonate	mg/L	-	<0.50	8.0	<0.50	<1.0	<1.0	<1.0
Hydroxide	mg/L	-	<0.50	<0.50	<0.5	<1.0	<1.0	<1.0
Nitrate (N)	mg/L	3	1.3	0.12	1.5	0.4	0.45	0.63
Nitrite (N)	mg/L	0.02 - 0.20 [3]	<0.010	0.012	<0.033	<0.010	<0.010	0.017
Nitrate and Nitrate (N)	mg/L	-	1.3	0.13	-	0.4	0.45	0.65
Total Dissolved Solids (TDS)	mg/L	500	1900	1800	1700	1700	1600	1600
Hardness	mg/L	-	110	100	97	87	88	91
Alkalinity (total as CaCO3)	mg/L	-	550	520	560	580	570	540
Alkalinity (pp as CaCO3)	mg/L	-	<0.50	6.7	<0.5	-	<1.0	
Ionic Balance	N/A	-	1.1	1.0	0.76	3.4	1.4	2.9
Water Nutrients								
Ammonia-N	mg/L	0.018-190 [4]	0.16	<0.050	<0.015	<0.015	0.056	<0.015
TKN	mg/L	-	0.49	0.40	0.6	0.62	0.62	0.68
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	<0.00089	<0.00089	<0.00089
F1 (C6-C10)	mg/L	2.2	<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	-	110	44	38	55	32	29
TOC	mg/L	-	-	-	-	-	-	
DOC	mg/L	-	8.4	9.1	10	8	9.6	8.4
Oil & Grease	mg/L	-	-	-	-	-	-	
Metals								
Aluminum	mg/L	0.0007 / 0.05 [5]	<0.030	0.011	0.0039	<0.0030	0.18	0.025
Antimony	mg/L	0.006	<0.0060	<0.00060	<0.0006	<0.00060	<0.00060	<0.00060
Arsenic	mg/L	0.005	0.0024	0.0010	0.00068	0.00068	0.00084	0.00096
Barium	mg/L	1	0.022	0.022	0.024	0.019	0.021	0.018
Beryllium	mg/L	-	<0.010	<0.0010	<0.001	<0.0010	<0.0010	
Boron	mg/L	1	0.11	0.14	0.12	0.12	0.12	0.11
Cadmium	mg/L	0.00004-0.00037 [2]	<0.00020	<0.000020	<0.00002	<0.000020	<0.000020	<0.000020
Chromium	mg/L	0.05	<0.010	0.0012	<0.001	<0.0010	<0.0010	<0.0010
Cobalt	mg/L	-	<0.0030	<0.00030	<0.0003	<0.0003	<0.00030	
Copper	mg/L	0.007	0.0035	0.0024	0.00083	0.00091	0.0014	0.00084
Lead	mg/L	0.001-0.007 [2]	<0.0020	<0.00020	<0.0002	<0.00020	<0.00020	<0.00020
Lithium	mg/L	-	0.21	0.24	0.24	0.24	0.22	
Manganese	mg/L	0.05	0.068	<0.0040	<0.004	<0.0040	0.0057	<0.0040
Mercury	mg/L	0.000005	<0.0000050	<0.0000020	<0.000002	0.0000033	<0.0000020	<0.0000019
Molybdenum	mg/L	-	0.0028	0.0011	0.00092	0.00089	0.00087	
Nickel	mg/L	0.007-0.170 [2]	0.0053	0.0023	0.001	0.00098	0.0029	0.00071
Phosphorus	mg/L	-	<0.10	<0.10	0.13	<0.10	<0.10	
Selenium	mg/L	0.002	<0.0020	0.00024	0.00046	0.0006	0.00058	0.00062
Silicon	mg/L	-	4.6	4.7	4.8	4.8	5.1	
Silver	mg/L	0.0001	<0.0010	<0.00010	<0.0001	<0.00010	<0.00010	<0.00010
Strontium	mg/L	-	0.37	0.33	0.35	0.33	0.32	
Sulphur	mg/L	-	260	290	250	230	230	
Thallium	mg/L	-	<0.0020	<0.00020	<0.0002	<0.00020	<0.00020	
Tin	mg/L	-	<0.010	<0.0010	<0.001	<0.0010	<0.0010	
Titanium	mg/L	-	<0.010	<0.0010	<0.001	<0.0010	0.0034	
Uranium	mg/L	0.01	0.0053	0.0032	0.0038	0.0024	0.0030	0.0040
Vanadium	mg/L	-	<0.010	0.0019	<0.001	<0.0010	<0.0010	
Zinc	mg/L	0.03	<0.030	0.0064	<0.003	<0.0030	<0.0030	<0.0030

Notes:

[1] Alberta Environment and Parks (AEP). 2019. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. 198 pp. Referenced guidelines are for fine textured soils under Agricultural land use

[2] Guideline varies with hardness

[3] Guideline varies with chloride

[4] Guideline varies with pH and temperature

[5] Guideline varies with pH

"-" No applicable guideline or not analyzed

Exceeds Regulatory Limit

Italic - Detection limit greater than Tier 1 Guideline

Table E30B: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 30B					
			Jun-15	Jun-16	Jun-17	Jun-18	Jun-19	May-20
Volatile Organic Compounds (VOCs)								
Bromodichloromethane	mg/L	-	-	-	-	-	<0.00050	
Bromoform	mg/L	-	-	-	-	-	<0.00050	
Bromomethane	mg/L	-	-	-	-	-	<0.0020	
Carbon tetrachloride	mg/L	0.002	-	-	-	-	<0.00050	<0.00050
Chlorobenzene	mg/L	0.0013	-	-	-	-	<0.00050	<0.00050
Chloroethane	mg/L	-	-	-	-	-	<0.0010	
Chloroform	mg/L	0.08	-	-	-	-	<0.00050	<0.00050
Chloromethane	mg/L	-	-	-	-	-	<0.0020	
Dibromochloromethane	mg/L	0.1	-	-	-	-	<0.0010	<0.0010
1,2-Dibromoethane	mg/L	-	-	-	-	-	<0.00020	
1,2-Dichlorobenzene	mg/L	0.0007	-	-	-	-	<0.00050	<0.00050
1,3-Dichlorobenzene	mg/L	-	-	-	-	-	<0.00050	
1,4-Dichlorobenzene	mg/L	0.001	-	-	-	-	<0.00050	<0.00050
1,1-Dichloroethane	mg/L	-	-	-	-	-	<0.00050	
1,2-Dichloroethane	mg/L	0.005	-	-	-	-	<0.00050	<0.00050
1,1-Dichloroethene	mg/L	0.014	-	-	-	-	<0.00050	<0.00050
1,2-Dichloroethene (cis)	mg/L	-	-	-	-	-	<0.00050	
1,2-Dichloroethene (trans)	mg/L	-	-	-	-	-	<0.00050	
1,2-Dichloropropane	mg/L	-	-	-	-	-	<0.00050	
1,3-Dichloropropene [cis]	mg/L	-	-	-	-	-	<0.00050	
1,3-Dichloropropene [trans]	mg/L	-	-	-	-	-	<0.00050	
Methyl t-Butyl Ether (MTBE)	mg/L	0.015	-	-	-	-	<0.00050	<0.00050
Methylene Chloride	mg/L	0.05	-	-	-	-	<0.0020	<0.0020
Methyl Methacrylate	mg/L	0.47	-	-	-	-	<0.00050	<0.00050
Styrene	mg/L	-	-	-	-	-	<0.00050	
1,1,1,2-Tetrachloroethane	mg/L	-	-	-	-	-	<0.0010	
1,1,2,2-Tetrachloroethane	mg/L	-	-	-	-	-	<0.0020	
Tetrachloroethene	mg/L	0.01	-	-	-	-	<0.00050	<0.00050
1,2,3-Trichlorobenzene	mg/L	0.008	-	-	-	-	<0.0010	<0.0010
1,2,4-Trichlorobenzene	mg/L	0.015	-	-	-	-	<0.0010	<0.0010
1,3,5-Trichlorobenzene	mg/L	0.014	-	-	-	-	<0.00050	<0.00050
1,1,1-Trichloroethane	mg/L	-	-	-	-	-	<0.00050	
1,1,2-Trichloroethane	mg/L	-	-	-	-	-	<0.00050	
Trichloroethene	mg/L	0.005	-	-	-	-	<0.00050	<0.00050
Trichlorofluoromethane	mg/L	-	-	-	-	-	<0.00050	
Trihalomethanes	mg/L	-	-	-	-	-	<0.0013	<0.0013
1,2,4-Trimethylbenzene	mg/L	-	-	-	-	-	<0.00050	
1,3,5-Trimethylbenzene	mg/L	-	-	-	-	-	<0.00050	
Vinyl chloride	mg/L	0.002	-	-	-	-	<0.00050	<0.00050

Notes:

[1] Alberta Environment and Parks (AEP). 2019. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. 198 pp. Referenced guidelines are for fine textured soils under Agricultural land use

[2] Guideline varies with hardness

[3] Guideline varies with chloride

[4] Guideline varies with pH and temperature

[5] Guideline varies with pH

"-" No applicable guideline or not analyzed

Exceeds Regulatory Limit

Italic - Detection limit greater than Tier 1 Guideline

Table E31A: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 31A					
			Jun-15	Jun-16	Jun-17	Jun-18	Jun-19	Jun-20
Field Measurements								
Field pH	-	-	8.6	8.53	-	8.03	8.46	8.13
Field EC	mS	-	1.98	1.72	-	1.796	1.702	1.73
Field Temperature	°C	-	10.5	9.5	-	13.8	10.5	8.7
Routine Water								
pH	-	6.5 - 8.5	8.57	8.53	8.57	8.48	8.66	8.46
Conductivity (EC)	µS/cm	1000	1900	1800	1700	1700	1800	1800
Calcium	mg/L	-	7.8	4.5	4.9 *	4.9	3.5	4.4
Magnesium	mg/L	-	3.1	<2.0	0.52 *	0.51	0.35	0.43
Sodium	mg/L	200	420	430	470	440	410	470
Potassium	mg/L	-	3.2	<3.0	1.9 *	1.6	1.5	1.6
Iron	mg/L	0.3	9.0	<0.60	0.18 *	0.074	0.06	<0.060
Sulphate	mg/L	128-429 [2]	220	120	76	67	58	51
Chloride	mg/L	100	12	6.7	5.2	11	8.5	4.9
Bicarbonate	mg/L	-	920	940	1000	1100	990	1000
Carbonate	mg/L	-	22	18	23	19	57	16
Hydroxide	mg/L	-	<0.50	<0.50	<0.5	<1.0	<1.0	<1.0
Nitrate (N)	mg/L	3	0.017	2.0	14	1.5	1.9	1.8
Nitrite (N)	mg/L	0.02 - 0.20 [3]	0.013	0.028	0.077	<0.010	<0.010	<0.010
Nitrate and Nitrate (N)	mg/L	-	0.03	2.0	3.2	1.5	1.9	1.8
Total Dissolved Solids (TDS)	mg/L	500	1100	1000	1100	1100	1000	1100
Hardness	mg/L	-	32	11	15	15	10	13
Alkalinity (total as CaCO3)	mg/L	-	790	800	880	900	910	880
Alkalinity (pp as CaCO3)	mg/L	-	19	15	19	-	48	
Ionic Balance	N/A	-	0.94	1.0	3.2	2	3.9	4.7
Water Nutrients								
Ammonia-N	mg/L	0.018-190 [4]	1.1	1.1	1.2	0.52	0.61	0.47
TKN	mg/L	-	5.2	1.0	7.4	1.9	3.0	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	<0.00089	<0.00089	<0.00089
F1 (C6-C10)	mg/L	2.2	<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	-	560	380	300	140	270	89
TOC	mg/L	-	-	-	-	-	-	
DOC	mg/L	-	19	17	-	11	18	9.5
Oil & Grease	mg/L	-	-	-	-	-	-	
Metals								
Aluminum	mg/L	0.0007 / 0.05 [5]	1.5	0.31	0.55 *	0.097	0.024	0.074
Antimony	mg/L	0.006	0.0013	<0.00060	0.00077 *	0.00065	0.00073	<0.00060
Arsenic	mg/L	0.005	0.0069	0.00088	0.0042 *	0.0035	0.0051	0.0028
Barium	mg/L	1	0.097	<0.10	0.085 *	0.05	0.051	0.054
Beryllium	mg/L	-	<0.0010	<0.0010	<0.0010 *	<0.0010	<0.0010	
Boron	mg/L	1	0.58	0.66	0.74 *	0.76	0.75	0.8
Cadmium	mg/L	0.00004-0.00037 [2]	0.000048	<0.000020	0.000025 *	<0.000020	0.000026	<0.000020
Chromium	mg/L	0.05	0.0017	<0.0010	<0.0010 *	<0.0010	<0.0010	<0.0010
Cobalt	mg/L	-	0.0034	0.00039	0.0016 *	<0.00030	0.00050	
Copper	mg/L	0.007	0.0093	0.00093	0.0046 *	0.0021	0.0020	0.0010
Lead	mg/L	0.001-0.007 [2]	0.0021	0.00043	0.00043 *	<0.00020	<0.00020	<0.00020
Lithium	mg/L	-	0.064	<0.20	0.086 *	0.083	0.072	
Manganese	mg/L	0.05	0.068	<0.040	0.036 *	<0.0040	0.027	0.021
Mercury	mg/L	0.000005	0.000008	0.000043	<0.0000020 *	0.0000051	-	<0.0000019
Molybdenum	mg/L	-	0.023	0.0021	0.019 *	0.01	0.023	0.011
Nickel	mg/L	0.007-0.170 [2]	0.020	0.0026	0.012 *	0.0033	0.0056	0.0031
Phosphorus	mg/L	-	0.12	<1.0	<0.10 *	<0.10	0.12	
Selenium	mg/L	0.002	0.0013	<0.00020	0.00078 *	0.00051	0.00054	0.00024
Silicon	mg/L	-	55	2.7	3.1 *	2.8	2.6	
Silver	mg/L	0.0001	<0.00010	<0.00010	<0.00010 *	<0.00010	<0.00010	<0.00010
Strontium	mg/L	-	0.10	<0.20	0.11 *	0.078	0.07	
Sulphur	mg/L	-	75	40	24 *	21	17	
Thallium	mg/L	-	<0.00020	<0.00020	<0.00020 *	<0.00020	<0.00020	
Tin	mg/L	-	<0.0010	<0.0010	<0.0010 *	<0.0010	<0.0010	
Titanium	mg/L	-	0.030	0.0032	0.0094 *	0.0014	<0.0010	
Uranium	mg/L	0.01	0.0095	0.00054	0.0041 *	0.0039	0.0032	0.0029
Vanadium	mg/L	-	0.0028	<0.0010	0.0013 *	<0.0010	<0.0010	
Zinc	mg/L	0.03	0.0051	<0.0030	<0.0030 *	<0.0030	<0.0030	<0.0030

Notes:

[1] Alberta Environment and Parks (AEP). 2019. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. 198 pp. Referenced guidelines are for fine textured soils under Agricultural land use

[2] Guideline varies with hardness

[3] Guideline varies with chloride

[4] Guideline varies with pH and temperature

[5] Guideline varies with pH

"-" No applicable guideline or not analyzed

Exceeds Regulatory Limit

Laboratory filtered (*)

Italic - Detection limit greater than Tier 1 Guideline

Table E31A: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 31A					
			Jun-15	Jun-16	Jun-17	Jun-18	Jun-19	Jun-20
Volatile Organic Compounds (VOCs)								
Bromodichloromethane	mg/L	-	-	-	-	-	<0.00050	
Bromoform	mg/L	-	-	-	-	-	<0.00050	
Bromomethane	mg/L	-	-	-	-	-	<0.0020	
Carbon tetrachloride	mg/L	0.002	-	-	-	-	<0.00050	<0.00050
Chlorobenzene	mg/L	0.0013	-	-	-	-	<0.00050	<0.00050
Chloroethane	mg/L	-	-	-	-	-	<0.0010	
Chloroform	mg/L	0.08	-	-	-	-	<0.00050	<0.00050
Chloromethane	mg/L	-	-	-	-	-	<0.0020	
Dibromochloromethane	mg/L	0.1	-	-	-	-	<0.0010	<0.0010
1,2-Dibromoethane	mg/L	-	-	-	-	-	<0.00020	
1,2-Dichlorobenzene	mg/L	0.0007	-	-	-	-	<0.00050	<0.00050
1,3-Dichlorobenzene	mg/L	-	-	-	-	-	<0.00050	
1,4-Dichlorobenzene	mg/L	0.001	-	-	-	-	<0.00050	<0.00050
1,1-Dichloroethane	mg/L	-	-	-	-	-	<0.00050	
1,2-Dichloroethane	mg/L	0.005	-	-	-	-	<0.00050	<0.00050
1,1-Dichloroethene	mg/L	0.014	-	-	-	-	<0.00050	<0.00050
1,2-Dichloroethene (cis)	mg/L	-	-	-	-	-	<0.00050	
1,2-Dichloroethene (trans)	mg/L	-	-	-	-	-	<0.00050	
1,2-Dichloropropane	mg/L	-	-	-	-	-	<0.00050	
1,3-Dichloropropene [cis]	mg/L	-	-	-	-	-	<0.00050	
1,3-Dichloropropene [trans]	mg/L	-	-	-	-	-	<0.00050	
Methyl t-Butyl Ether (MTBE)	mg/L	0.015	-	-	-	-	<0.00050	<0.00050
Methylene Chloride	mg/L	0.05	-	-	-	-	<0.0020	<0.0020
Methyl Methacrylate	mg/L	0.47	-	-	-	-	<0.00050	<0.00050
Styrene	mg/L	-	-	-	-	-	<0.00050	
1,1,1,2-Tetrachloroethane	mg/L	-	-	-	-	-	<0.0010	
1,1,2,2-Tetrachloroethane	mg/L	-	-	-	-	-	<0.0020	
Tetrachloroethene	mg/L	0.01	-	-	-	-	<0.00050	<0.00050
1,2,3-Trichlorobenzene	mg/L	0.008	-	-	-	-	<0.0010	<0.0010
1,2,4-Trichlorobenzene	mg/L	0.015	-	-	-	-	<0.0010	<0.0010
1,3,5-Trichlorobenzene	mg/L	0.014	-	-	-	-	<0.00050	<0.00050
1,1,1-Trichloroethane	mg/L	-	-	-	-	-	<0.00050	
1,1,2-Trichloroethane	mg/L	-	-	-	-	-	<0.00050	
Trichloroethene	mg/L	0.005	-	-	-	-	<0.00050	<0.00050
Trichlorofluoromethane	mg/L	-	-	-	-	-	<0.00050	
Trihalomethanes	mg/L	-	-	-	-	-	<0.0013	<0.0013
1,2,4-Trimethylbenzene	mg/L	-	-	-	-	-	<0.00050	
1,3,5-Trimethylbenzene	mg/L	-	-	-	-	-	<0.00050	
Vinyl chloride	mg/L	0.002	-	-	-	-	<0.00050	<0.00050

Notes:

[1] Alberta Environment and Parks (AEP). 2019. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. 198 pp. Referenced guidelines are for fine textured soils under Agricultural land use

[2] Guideline varies with hardness

[3] Guideline varies with chloride

[4] Guideline varies with pH and temperature

[5] Guideline varies with pH

"-" No applicable guideline or not analyzed

Exceeds Regulatory Limit

Laboratory filtered (*)

Italic - Detection limit greater than Tier 1 Guideline

Table E31B: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 31B					
			Jun-15	Jun-16	Jun-17	Jun-18	Jun-19	Jun-20
Field Measurements								
Field pH	-	-	8.4	8.33	8.1	7.55	8.15	7.78
Field EC	mS	-	2.53	2.50	2.66	2.72	2.71	2.75
Field Temperature	°C	-	8.0	9.4	8.1	9.5	10.3	7.6
Routine Water								
pH	-	6.5 - 8.5	8.29	8.56	8.4	8.39	8.45	8.29
Conductivity (EC)	µS/cm	1000	2400	2500	2500	2700	2800	2700
Calcium	mg/L	-	15	15	14	15	17	18
Magnesium	mg/L	-	4.3	5.4	5.6	5.7	6.4	7
Sodium	mg/L	200	550	590	570	660	630	650
Potassium	mg/L	-	3.7	3.6	3.3	3.4	3.5	3.6
Iron	mg/L	0.3	0.75	0.26	<0.060	<0.060	0.22	<0.060
Sulphate	mg/L	128-429 [2]	670	750	780	850	850	900
Chloride	mg/L	100	1.1	1.4	1.4	<1.0	2.0	1.6
Bicarbonate	mg/L	-	690	610	640	630	610	580
Carbonate	mg/L	-	<0.50	13	5.2	7.2	12	<1.0
Hydroxide	mg/L	-	<0.50	<0.50	<0.50	<1.0	<1.0	<1.0
Nitrate (N)	mg/L	3	0.046	<0.010	0.8	0.14	0.15	0.17
Nitrite (N)	mg/L	0.02 - 0.20 [3]	<0.010	<0.010	<0.033	<0.010	<0.010	<0.010
Nitrate and Nitrate (N)	mg/L	-	0.046	<0.020	-	0.14	0.15	0.17
Total Dissolved Solids (TDS)	mg/L	500	1600	1700	1700	1900	1800	1900
Hardness	mg/L	-	55	59	59	61	68	73
Alkalinity (total as CaCO3)	mg/L	-	570	520	530	530	520	480
Alkalinity (pp as CaCO3)	mg/L	-	<0.50	11	4.3	-	9.6	
Ionic Balance	N/A	-	0.99	1.0	1.7	2.6	1.2	2.6
Water Nutrients								
Ammonia-N	mg/L	0.018-190 [4]	0.59	0.13	0.034	<0.015	0.02	0.015
TKN	mg/L	-	2.2	0.38	0.51	0.4	0.51	0.46
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	<0.00089	<0.00089	<0.00089
F1 (C6-C10)	mg/L	2.2	0.12	<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	-	140	28	30	24	31	33
TOC	mg/L	-	-	-	-	-	-	
DOC	mg/L	-	9	8.2	8.8	7.7	10	7.5
Oil & Grease	mg/L	-	-	-	-	-	-	
Metals								
Aluminum	mg/L	0.0007 / 0.05 [5]	0.70	0.084	0.011	0.0038	0.12	0.0032
Antimony	mg/L	0.006	0.00095	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic	mg/L	0.005	0.0094	0.0017	0.0011	0.0011	0.0011	0.00099
Barium	mg/L	1	0.024	0.023	0.022	0.018	0.019	0.018
Beryllium	mg/L	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	
Boron	mg/L	1	0.16	0.20	0.17	0.18	0.17	0.18
Cadmium	mg/L	0.00004-0.00037 [2]	<0.00002	<0.000020	<0.000020	<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	-	0.0021	0.00053	<0.0003	<0.00030	<0.00030	
Copper	mg/L	0.007	0.0022	0.0022	0.00027	0.00064	0.0017	0.00082
Lead	mg/L	0.001-0.007 [2]	0.00048	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Lithium	mg/L	-	0.12	0.16	0.15	0.16	0.15	
Manganese	mg/L	0.05	0.061	0.041	0.017	0.01	0.015	<0.0040
Mercury	mg/L	0.000005	<0.0000050	0.0000027	<0.0000020	0.0000035	<0.0000020	<0.0000019
Molybdenum	mg/L	-	0.0058	0.0015	0.0014	0.0013	0.0014	
Nickel	mg/L	0.007-0.170 [2]	0.0086	0.0033	0.00081	0.0008	0.0011	0.00067
Phosphorus	mg/L	-	<0.10	<0.10	0.13	<0.10	<0.10	
Selenium	mg/L	0.002	0.00064	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Silicon	mg/L	-	5.2	3.9	3.6	3.6	3.9	
Silver	mg/L	0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Strontium	mg/L	-	0.17	0.23	0.24	0.27	0.27	
Sulphur	mg/L	-	220	270	250	270	280	
Thallium	mg/L	-	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	
Tin	mg/L	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	
Titanium	mg/L	-	0.018	<0.0010	<0.0010	<0.0010	0.0025	
Uranium	mg/L	0.01	0.0034	0.00099	0.0012	0.0008	0.00098	0.0011
Vanadium	mg/L	-	0.0024	0.0011	<0.0010	<0.0010	<0.0010	
Zinc	mg/L	0.03	<0.0030	0.0078	<0.0030	<0.0030	<0.0030	<0.0030

Notes:

[1] Alberta Environment and Parks (AEP). 2019. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. 198 pp. Referenced guidelines are for fine textured soils under Agricultural land use

[2] Guideline varies with hardness

[3] Guideline varies with chloride

[4] Guideline varies with pH and temperature

[5] Guideline varies with pH

"-" No applicable guideline or not analyzed

Exceeds Regulatory Limit

Italic - Detection limit greater than Tier 1 Guideline

Table E31B: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 31B					
			Jun-15	Jun-16	Jun-17	Jun-18	Jun-19	Jun-20
Volatile Organic Compounds (VOCs)								
Bromodichloromethane	mg/L	-	-	-	-	-	<0.00050	
Bromoform	mg/L	-	-	-	-	-	<0.00050	
Bromomethane	mg/L	-	-	-	-	-	<0.0020	
Carbon tetrachloride	mg/L	0.002	-	-	-	-	<0.00050	<0.00050
Chlorobenzene	mg/L	0.0013	-	-	-	-	<0.00050	<0.00050
Chloroethane	mg/L	-	-	-	-	-	<0.0010	
Chloroform	mg/L	0.08	-	-	-	-	<0.00050	<0.00050
Chloromethane	mg/L	-	-	-	-	-	<0.0020	
Dibromochloromethane	mg/L	0.1	-	-	-	-	<0.0010	<0.0010
1,2-Dibromoethane	mg/L	-	-	-	-	-	<0.00020	
1,2-Dichlorobenzene	mg/L	0.0007	-	-	-	-	<0.00050	<0.00050
1,3-Dichlorobenzene	mg/L	-	-	-	-	-	<0.00050	
1,4-Dichlorobenzene	mg/L	0.001	-	-	-	-	<0.00050	<0.00050
1,1-Dichloroethane	mg/L	-	-	-	-	-	<0.00050	
1,2-Dichloroethane	mg/L	0.005	-	-	-	-	<0.00050	<0.00050
1,1-Dichloroethene	mg/L	0.014	-	-	-	-	<0.00050	<0.00050
1,2-Dichloroethene (cis)	mg/L	-	-	-	-	-	<0.00050	
1,2-Dichloroethene (trans)	mg/L	-	-	-	-	-	<0.00050	
1,2-Dichloropropane	mg/L	-	-	-	-	-	<0.00050	
1,3-Dichloropropene [cis]	mg/L	-	-	-	-	-	<0.00050	
1,3-Dichloropropene [trans]	mg/L	-	-	-	-	-	<0.00050	
Methyl t-Butyl Ether (MTBE)	mg/L	0.015	-	-	-	-	<0.00050	<0.00050
Methylene Chloride	mg/L	0.05	-	-	-	-	<0.0020	<0.0020
Methyl Methacrylate	mg/L	0.47	-	-	-	-	<0.00050	<0.00050
Styrene	mg/L	-	-	-	-	-	<0.00050	
1,1,1,2-Tetrachloroethane	mg/L	-	-	-	-	-	<0.0010	
1,1,2,2-Tetrachloroethane	mg/L	-	-	-	-	-	<0.0020	
Tetrachloroethene	mg/L	0.01	-	-	-	-	<0.00050	<0.00050
1,2,3-Trichlorobenzene	mg/L	0.008	-	-	-	-	<0.0010	<0.0010
1,2,4-Trichlorobenzene	mg/L	0.015	-	-	-	-	<0.0010	<0.0010
1,3,5-Trichlorobenzene	mg/L	0.014	-	-	-	-	<0.00050	<0.00050
1,1,1-Trichloroethane	mg/L	-	-	-	-	-	<0.00050	
1,1,2-Trichloroethane	mg/L	-	-	-	-	-	<0.00050	
Trichloroethene	mg/L	0.005	-	-	-	-	<0.00050	<0.00050
Trichlorofluoromethane	mg/L	-	-	-	-	-	<0.00050	
Trihalomethanes	mg/L	-	-	-	-	-	<0.0013	<0.0013
1,2,4-Trimethylbenzene	mg/L	-	-	-	-	-	<0.00050	
1,3,5-Trimethylbenzene	mg/L	-	-	-	-	-	<0.00050	
Vinyl chloride	mg/L	0.002	-	-	-	-	<0.00050	<0.00050

Notes:

[1] Alberta Environment and Parks (AEP). 2019. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. 198 pp. Referenced guidelines are for fine textured soils under Agricultural land use

[2] Guideline varies with hardness

[3] Guideline varies with chloride

[4] Guideline varies with pH and temperature

[5] Guideline varies with pH

"-" No applicable guideline or not analyzed

Exceeds Regulatory Limit

Italic - Detection limit greater than Tier 1 Guideline

Table E32A: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 32A					
			Jun-15	Jun-16	Jun-17	Jun-18	Jun-19	May-20
Field Measurements								
Field pH	-	-	8.2	7.79	7.6	7.51	7.65	7.74
Field EC	mS	-	8.66	7.91	8.49	13.26	8.1	8.1
Field Temperature	°C	-	7.6	8.2	7.3	11.7	11.5	8.1
Routine Water								
pH	-	6.5 - 8.5	8.16	8.25	8.12	8	8.04	8.12
Conductivity (EC)	µS/cm	1000	8200	8100	8000	8100	8200	8000
Calcium	mg/L	-	120	120	120	120	120	110
Magnesium	mg/L	-	15	15	15	16	<20	12
Sodium	mg/L	200	2000	2000	2000	2100	1900	2000
Potassium	mg/L	-	11	8.4	7.7	8	<30	6.5
Iron	mg/L	0.3	<0.60	0.12	<0.60	<0.60	*<0.60*	*<0.60*
Sulphate	mg/L	128-429 [2]	4100	3900	3400	3500	3300	3200
Chloride	mg/L	100	8.9	3.1	3.2	2.8	3.7	4.1
Bicarbonate	mg/L	-	960	980	1000	1000	1000	810
Carbonate	mg/L	-	<0.50	<0.50	<0.50	<1.0	<1.0	<1.0
Hydroxide	mg/L	-	<0.50	<0.50	<0.50	<1.0	<1.0	<1.0
Nitrate (N)	mg/L	3	<0.010	<0.050	<0.22	0.058	<0.20	0.11
Nitrite (N)	mg/L	0.02 - 0.20 [3]	0.013	<0.050	0.71	0.017	<0.20	0.26
Nitrate and Nitrate (N)	mg/L	-	0.013	<0.020	-	0.075	<0.28	0.37
Total Dissolved Solids (TDS)	mg/L	500	6700	6500	6100	6300	5900	5800
Hardness	mg/L	-	370	360	350	360	300	320
Alkalinity (total as CaCO3)	mg/L	-	790	800	850	840	820	670
Alkalinity (pp as CaCO3)	mg/L	-	<0.50	<0.50	<0.50	-	<1.0	
Ionic Balance	N/A	-	0.92	1.0	4.4	4.5	2.8	7.6
Water Nutrients								
Ammonia-N	mg/L	0.018-190 [4]	3.5	2.9	3.2	2.8	2.9	3
TKN	mg/L	-	6.8	3.2	3.2	3.2	3.2	3.1
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	0.0011	0.0011
Ethylbenzene	mg/L	0.0016	<0.00040	<0.00040	<0.00040	<0.00040	0.00043	0.00043
Xylene	mg/L	0.02	<0.00080	<0.00080	<0.00080	<0.00089	0.0026	0.0026
F1 (C6-C10)	mg/L	2.2	<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	0.28
Organics								
COD	mg/L	-	410	26	19	39	39	26
TOC	mg/L	-	-	-	-	-	-	
DOC	mg/L	-	12	7.9	7.2	7.6	7.8	8.9
Oil & Grease	mg/L	-	-	-	-	-	-	
Metals								
Aluminum	mg/L	0.0007 / 0.05 [5]	<0.030	0.029	0.008	0.008	<0.0030	<0.0030
Antimony	mg/L	0.006	<0.0060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic	mg/L	0.005	0.0041	0.00051	0.00037	0.00035	0.00039	0.00061
Barium	mg/L	1	<0.10	0.015	<0.10	<0.10	<1.0	0.021
Beryllium	mg/L	-	<0.010	<0.0010	<0.0010	<0.0010	<0.0010	
Boron	mg/L	1	0.85	1.2	1.2	1.2	1.1	0.94
Cadmium	mg/L	0.00004-0.00037 [2]	<0.00020	<0.000020	0.000021	0.000021	<0.000020	0.000027
Chromium	mg/L	0.05	<0.010	0.0015	<0.0010	<0.0010	<0.0010	<0.0010
Cobalt	mg/L	-	<0.0030	0.00077	0.00062	0.00044	0.00047	
Copper	mg/L	0.007	<0.0020	0.0031	0.00073	0.0082	0.0016	0.0012
Lead	mg/L	0.001-0.007 [2]	<0.0020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Lithium	mg/L	-	0.36	0.47	0.49	0.45	<2.0	
Manganese	mg/L	0.05	0.15	0.12	0.14	0.12	0.11	0.16
Mercury	mg/L	0.000005	<0.0000050	0.0000023	<0.0000020	0.0000032	<0.0000020	<0.0000019
Molybdenum	mg/L	-	0.014	0.00054	0.00068	0.00069	0.00064	
Nickel	mg/L	0.007-0.170 [2]	0.011	0.0032	0.0016	0.0026	0.0011	0.0018
Phosphorus	mg/L	-	<1.0	<0.10	<1.0	<1.0	<10	
Selenium	mg/L	0.002	<0.0020	<0.00020	<0.00020	<0.00020	0.00025	<0.00020
Silicon	mg/L	-	2.4	5.2	5.3	5.2	<10	
Silver	mg/L	0.0001	*<0.0010*	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Strontium	mg/L	-	2.6	2.9	3.0	3.0	2.8	
Sulphur	mg/L	-	1300	1300	1300	1300	1300	
Thallium	mg/L	-	<0.0020	<0.00020	<0.00020	<0.00020	<0.00020	
Tin	mg/L	-	<0.010	<0.0010	<0.0010	<0.0010	<0.0010	
Titanium	mg/L	-	<0.010	<0.0010	<0.0010	<0.0010	<0.0010	
Uranium	mg/L	0.01	0.0080	0.00016	0.00014	0.00013	0.00011	0.00042
Vanadium	mg/L	-	<0.010	<0.0010	<0.0010	<0.0010	<0.0010	
Zinc	mg/L	0.03	<0.030	0.015	<0.0030	0.0091	<0.0030	<0.0030

Notes:

[1] Alberta Environment and Parks (AEP). 2019. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. 198 pp. Referenced guidelines are for fine textured soils under Agricultural land use

[2] Guideline varies with hardness

[3] Guideline varies with chloride

[4] Guideline varies with pH and temperature

[5] Guideline varies with pH

"-" No applicable guideline or not analyzed

Exceeds Regulatory Limit

Italic - Detection limit greater than Tier 1 Guideline

Table E32A: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 32A					
			Jun-15	Jun-16	Jun-17	Jun-18	Jun-19	May-20
Volatile Organic Compounds (VOCs)								
Bromodichloromethane	mg/L	-	-	-	-	-	<0.00050	
Bromoform	mg/L	-	-	-	-	-	<0.00050	
Bromomethane	mg/L	-	-	-	-	-	<0.0020	
Carbon tetrachloride	mg/L	0.002	-	-	-	-	<0.00050	<0.00050
Chlorobenzene	mg/L	0.0013	-	-	-	-	<0.00050	<0.00050
Chloroethane	mg/L	-	-	-	-	-	<0.0010	
Chloroform	mg/L	0.08	-	-	-	-	<0.00050	<0.00050
Chloromethane	mg/L	-	-	-	-	-	<0.0020	
Dibromochloromethane	mg/L	0.1	-	-	-	-	<0.0010	<0.0010
1,2-Dibromoethane	mg/L	-	-	-	-	-	<0.00020	
1,2-Dichlorobenzene	mg/L	0.0007	-	-	-	-	<0.00050	<0.00050
1,3-Dichlorobenzene	mg/L	-	-	-	-	-	<0.00050	
1,4-Dichlorobenzene	mg/L	0.001	-	-	-	-	<0.00050	<0.00050
1,1-Dichloroethane	mg/L	-	-	-	-	-	<0.00050	
1,2-Dichloroethane	mg/L	0.005	-	-	-	-	<0.00050	<0.00050
1,1-Dichloroethene	mg/L	0.014	-	-	-	-	<0.00050	<0.00050
1,2-Dichloroethene (cis)	mg/L	-	-	-	-	-	<0.00050	
1,2-Dichloroethene (trans)	mg/L	-	-	-	-	-	<0.00050	
1,2-Dichloropropane	mg/L	-	-	-	-	-	<0.00050	
1,3-Dichloropropene [cis]	mg/L	-	-	-	-	-	<0.00050	
1,3-Dichloropropene [trans]	mg/L	-	-	-	-	-	<0.00050	
Methyl t-Butyl Ether (MTBE)	mg/L	0.015	-	-	-	-	<0.00050	<0.00050
Methylene Chloride	mg/L	0.05	-	-	-	-	<0.0020	<0.0020
Methyl Methacrylate	mg/L	0.47	-	-	-	-	<0.00050	<0.00050
Styrene	mg/L	-	-	-	-	-	<0.00050	
1,1,1,2-Tetrachloroethane	mg/L	-	-	-	-	-	<0.0010	
1,1,2,2-Tetrachloroethane	mg/L	-	-	-	-	-	<0.0020	
Tetrachloroethene	mg/L	0.01	-	-	-	-	<0.00050	<0.00050
1,2,3-Trichlorobenzene	mg/L	0.008	-	-	-	-	<0.0010	<0.0010
1,2,4-Trichlorobenzene	mg/L	0.015	-	-	-	-	<0.0010	<0.0010
1,3,5-Trichlorobenzene	mg/L	0.014	-	-	-	-	<0.00050	<0.00050
1,1,1-Trichloroethane	mg/L	-	-	-	-	-	<0.00050	
1,1,2-Trichloroethane	mg/L	-	-	-	-	-	<0.00050	
Trichloroethene	mg/L	0.005	-	-	-	-	<0.00050	<0.00050
Trichlorofluoromethane	mg/L	-	-	-	-	-	<0.00050	
Trihalomethanes	mg/L	-	-	-	-	-	<0.0013	<0.0013
1,2,4-Trimethylbenzene	mg/L	-	-	-	-	-	<0.00050	
1,3,5-Trimethylbenzene	mg/L	-	-	-	-	-	<0.00050	
Vinyl chloride	mg/L	0.002	-	-	-	-	<0.00050	<0.00050

Notes:

[1] Alberta Environment and Parks (AEP). 2019. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. 198 pp. Referenced guidelines are for fine textured soils under Agricultural land use

[2] Guideline varies with hardness

[3] Guideline varies with chloride

[4] Guideline varies with pH and temperature

[5] Guideline varies with pH

"-" No applicable guideline or not analyzed

Exceeds Regulatory Limit

Italic - Detection limit greater than Tier 1 Guideline

Table E32B: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 32B					
			Jun-15	Jun-16	Jun-17	Jun-18	Jun-19	May-20
Field Measurements								
Field pH	-	-	7.7	7.69	7.4	7.48	7.50	7.03
Field EC	mS	-	12.55	13.26	13.01	8	12.01	12.22
Field Temperature	°C	-	7.6	9.1	6.8	9.6	11.7	8.5
Routine Water								
pH	-	6.5 - 8.5	7.73	7.97	7.98	7.82	7.98	7.92
Conductivity (EC)	µS/cm	1000	12,000	13,000	12,000	12,000	12,000	12,000
Calcium	mg/L	-	210	230	210	220	220	220
Magnesium	mg/L	-	100	120	100	110	92	96
Sodium	mg/L	200	2800	3200	3000	3200	2900	3200
Potassium	mg/L	-	18	17	15	16	<30	14
Iron	mg/L	0.3	<0.60	<0.60	<0.60	<0.60	*<0.60*	*0.22*
Sulphate	mg/L	128-429 [2]	6300	6800	5700	6400	5700	4500
Chloride	mg/L	100	110	120	120	130	130	140
Bicarbonate	mg/L	-	1300	1300	1300	1300	1200	1100
Carbonate	mg/L	-	<0.50	<0.50	<0.50	<1.0	<1.0	<1.0
Hydroxide	mg/L	-	<0.50	<0.50	<0.50	<1.0	<1.0	<1.0
Nitrate (N)	mg/L	3	<0.050	<0.050	<0.22	0.14	<0.10	0.17
Nitrite (N)	mg/L	0.02 - 0.20 [3]	<0.050	<0.050	<0.16	0.073	<0.10	0.11
Nitrate and Nitrate (N)	mg/L	-	<0.050	<0.020	-	0.22	<0.14	0.28
Total Dissolved Solids (TDS)	mg/L	500	10,000	11,000	9,800	11,000	9700	8700
Hardness	mg/L	-	930	1100	950	1000	930	940
Alkalinity (total as CaCO3)	mg/L	-	1100	1100	1000	1000	1000	930
Alkalinity (pp as CaCO3)	mg/L	-	<0.50	<0.50	<0.50	-	<1.0	
Ionic Balance	N/A	-	0.91	0.97	1.9	1.1	0.83	14
Water Nutrients								
Ammonia-N	mg/L	0.018-190 [4]	1.3	1.5	1.5	1.1	1.3	1.5
TKN	mg/L	-	3.5	2.6	2.3	2	2.3	2.4
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	<0.00089	<0.00089	<0.00089
F1 (C6-C10)	mg/L	2.2	<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	-	210	78	74	85	51	68
TOC	mg/L	-	-	-	-	-	-	
DOC	mg/L	-	18	15	17	15	15	13
Oil & Grease	mg/L	-	-	-	-	-	-	
Metals								
Aluminum	mg/L	0.0007 / 0.05 [5]	0.0045	0.0038	0.016	0.27	<0.0030	<0.0030
Antimony	mg/L	0.006	0.0016	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic	mg/L	0.005	0.012	0.0016	0.00085	0.0011	0.00081	0.00068
Barium	mg/L	1	<0.10	<0.10	<0.10	<0.10	<1.0	0.014
Beryllium	mg/L	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	
Boron	mg/L	1	0.40	0.48	0.46	0.48	0.46	0.39
Cadmium	mg/L	0.00004-0.00037 [2]	0.00011	0.00046	0.000083	0.00014	0.000028	<0.000020
Chromium	mg/L	0.05	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Cobalt	mg/L	-	0.0093	0.0054	0.0028	0.0033	0.0018	
Copper	mg/L	0.007	0.0012	0.0036	0.0022	0.001	0.00023	0.00029
Lead	mg/L	0.001-0.007 [2]	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Lithium	mg/L	-	0.43	0.54	0.47	0.52	<2.0	
Manganese	mg/L	0.05	0.68	0.85	0.67	0.57	0.52	0.6
Mercury	mg/L	0.000005	<0.0000050	<0.0000020	<0.0000020	0.0000037	<0.0000020	<0.0000019
Molybdenum	mg/L	-	0.0089	0.0016	0.0012	0.007	0.0010	
Nickel	mg/L	0.007-0.170 [2]	0.031	0.013	0.0066	0.0089	0.0037	0.005
Phosphorus	mg/L	-	<1.0	<1.0	<1.0	<1.0	<10	
Selenium	mg/L	0.002	0.00079	0.00046	<0.00020	0.00028	0.00063	<0.00020
Silicon	mg/L	-	3.9	4.7	4.7	4.6	<10	
Silver	mg/L	0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Strontium	mg/L	-	4.3	5.1	4.7	5.1	4.6	
Sulphur	mg/L	-	2000	2300	2000	2200	2100	
Thallium	mg/L	-	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	
Tin	mg/L	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	
Titanium	mg/L	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	
Uranium	mg/L	0.01	0.0027	0.00085	0.00084	0.0006	0.00045	0.00049
Vanadium	mg/L	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	
Zinc	mg/L	0.03	0.0055	0.0040	<0.0030	<0.0030	<0.0030	<0.0030

Notes:

[1] Alberta Environment and Parks (AEP). 2019. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. 198 pp. Referenced guidelines are for fine textured soils under Agricultural land use

[2] Guideline varies with hardness

[3] Guideline varies with chloride

[4] Guideline varies with pH and temperature

[5] Guideline varies with pH

"-" No applicable guideline or not analyzed

Exceeds Regulatory Limit

Italic - Detection limit greater than Tier 1 Guideline

Table E32B: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 32B					
			Jun-15	Jun-16	Jun-17	Jun-18	Jun-19	May-20
Volatile Organic Compounds (VOCs)								
Bromodichloromethane	mg/L	-	-	-	-	-	<0.00050	
Bromoform	mg/L	-	-	-	-	-	<0.00050	
Bromomethane	mg/L	-	-	-	-	-	<0.0020	
Carbon tetrachloride	mg/L	0.002	-	-	-	-	<0.00050	<0.00050
Chlorobenzene	mg/L	0.0013	-	-	-	-	<0.00050	<0.00050
Chloroethane	mg/L	-	-	-	-	-	<0.0010	
Chloroform	mg/L	0.08	-	-	-	-	<0.00050	<0.00050
Chloromethane	mg/L	-	-	-	-	-	<0.0020	
Dibromochloromethane	mg/L	0.1	-	-	-	-	<0.0010	<0.0010
1,2-Dibromoethane	mg/L	-	-	-	-	-	<0.00020	
1,2-Dichlorobenzene	mg/L	0.0007	-	-	-	-	<0.00050	<0.00050
1,3-Dichlorobenzene	mg/L	-	-	-	-	-	<0.00050	
1,4-Dichlorobenzene	mg/L	0.001	-	-	-	-	<0.00050	<0.00050
1,1-Dichloroethane	mg/L	-	-	-	-	-	<0.00050	
1,2-Dichloroethane	mg/L	0.005	-	-	-	-	<0.00050	<0.00050
1,1-Dichloroethene	mg/L	0.014	-	-	-	-	<0.00050	<0.00050
1,2-Dichloroethene (cis)	mg/L	-	-	-	-	-	<0.00050	
1,2-Dichloroethene (trans)	mg/L	-	-	-	-	-	<0.00050	
1,2-Dichloropropane	mg/L	-	-	-	-	-	<0.00050	
1,3-Dichloropropene [cis]	mg/L	-	-	-	-	-	<0.00050	
1,3-Dichloropropene [trans]	mg/L	-	-	-	-	-	<0.00050	
Methyl t-Butyl Ether (MTBE)	mg/L	0.015	-	-	-	-	<0.00050	<0.00050
Methylene Chloride	mg/L	0.05	-	-	-	-	<0.0020	<0.0020
Methyl Methacrylate	mg/L	0.47	-	-	-	-	<0.00050	<0.00050
Styrene	mg/L	-	-	-	-	-	<0.00050	
1,1,1,2-Tetrachloroethane	mg/L	-	-	-	-	-	<0.0010	
1,1,2,2-Tetrachloroethane	mg/L	-	-	-	-	-	<0.0020	
Tetrachloroethene	mg/L	0.01	-	-	-	-	<0.00050	<0.00050
1,2,3-Trichlorobenzene	mg/L	0.008	-	-	-	-	<0.0010	<0.0010
1,2,4-Trichlorobenzene	mg/L	0.015	-	-	-	-	<0.0010	<0.0010
1,3,5-Trichlorobenzene	mg/L	0.014	-	-	-	-	<0.00050	<0.00050
1,1,1-Trichloroethane	mg/L	-	-	-	-	-	<0.00050	
1,1,2-Trichloroethane	mg/L	-	-	-	-	-	<0.00050	
Trichloroethene	mg/L	0.005	-	-	-	-	<0.00050	<0.00050
Trichlorofluoromethane	mg/L	-	-	-	-	-	<0.00050	
Trihalomethanes	mg/L	-	-	-	-	-	<0.0013	<0.0013
1,2,4-Trimethylbenzene	mg/L	-	-	-	-	-	<0.00050	
1,3,5-Trimethylbenzene	mg/L	-	-	-	-	-	<0.00050	
Vinyl chloride	mg/L	0.002	-	-	-	-	<0.00050	<0.00050

Notes:

[1] Alberta Environment and Parks (AEP). 2019. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. 198 pp. Referenced guidelines are for fine textured soils under Agricultural land use

[2] Guideline varies with hardness

[3] Guideline varies with chloride

[4] Guideline varies with pH and temperature

[5] Guideline varies with pH

"-" No applicable guideline or not analyzed

Exceeds Regulatory Limit

Italic - Detection limit greater than Tier 1 Guideline

Table E33A: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 33A					
			May-15	Jun-16	Jun-17	Jun-18	Jun-19	Jun-20
Field Measurements								
Field pH	-	-	8.6	8.66	-	8.97	8.54	8.81
Field EC	mS	-	2.54	2.01	-	2.37	1.859	1.768
Field Temperature	°C	-	6.9	7.0	-	10.9	9.6	8.1
Routine Water								
pH	-	6.5 - 8.5	8.32	8.52	8.52	8.57	8.72	8.45
Conductivity (EC)	µS/cm	1000	3300	2100	1800	1800	1800	1800
Calcium	mg/L	-	35	7.4	4.7	6.4	3.6	4
Magnesium	mg/L	-	10	1.4	0.7	0.81	0.41	0.52
Sodium	mg/L	200	930	480	390	460	410	450
Potassium	mg/L	-	5.8	2.2	1.4	2	1.5	1.5
Iron	mg/L	0.3	<0.060	0.60	<0.060	1.2	0.34	<0.060
Sulphate	mg/L	128-429 [2]	860	230	130	75	51	59
Chloride	mg/L	100	28	27	24	28	24	24
Bicarbonate	mg/L	-	1100	990	990	1100	960	1000
Carbonate	mg/L	-	2.6	16	18	30	60	15
Hydroxide	mg/L	-	<0.50	<0.50	<0.50	<1.0	<1.0	<1.0
Nitrate (N)	mg/L	3	<0.010	<0.010	<0.044	0.021	<0.010	<0.010
Nitrite (N)	mg/L	0.02 - 0.20 [3]	<0.010	<0.010	<0.033	<0.010	<0.010	<0.010
Nitrate and Nitrate (N)	mg/L	-	<0.010	<0.020	<0.010	0.021	<0.014	<0.014
Total Dissolved Solids (TDS)	mg/L	500	2400	1200	1100	1100	1000	1100
Hardness	mg/L	-	130	24	15	19	11	12
Alkalinity (total as CaCO3)	mg/L	-	870	840	840	930	890	860
Alkalinity (pp as CaCO3)	mg/L	-	2.2	13	15	-	50	
Ionic Balance	N/A	-	1.2	0.96	7.7	0.47	3.2	2.5
Water Nutrients								
Ammonia-N	mg/L	0.018-190 [4]	1.3	0.89	0.79	0.7	1.4	0.58
TKN	mg/L	-	8.0	2.6	2.4	1.5	9.2	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	<0.00089	<0.00089	<0.00089
F1 (C6-C10)	mg/L	2.2	<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	-	460	140	130	110	730	67
TOC	mg/L	-	-	-	-	-	-	
DOC	mg/L	-	39	33	25	26	23	27
Oil & Grease	mg/L	-	-	-	-	-	-	
Metals								
Aluminum	mg/L	0.0007 / 0.05 [5]	0.0044	0.66	0.005	0.22	0.081	0.0083
Antimony	mg/L	0.006	0.00076	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic	mg/L	0.005	0.0089	0.0042	0.0018	0.0056	0.0011	0.00088
Barium	mg/L	1	0.070	0.080	0.053	0.11	0.059	0.024
Beryllium	mg/L	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	
Boron	mg/L	1	0.50	0.71	0.68	0.82	0.87	0.75
Cadmium	mg/L	0.00004-0.00037 [2]	<0.000020	<0.000020	<0.000020	<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	-	0.0032	0.0016	0.00057	0.0016	0.00030	
Copper	mg/L	0.007	0.0017	0.028	<0.00020	0.0012	0.00087	0.0019
Lead	mg/L	0.001-0.007 [2]	<0.00020	0.00094	<0.00020	0.00073	<0.00020	<0.00020
Lithium	mg/L	-	0.20	0.089	0.07	0.087	0.078	
Manganese	mg/L	0.05	0.13	0.058	0.027	0.081	0.037	0.069
Mercury	mg/L	0.000005	<0.0000050	<0.0000060	<0.0000020	0.000016	<0.0000020	<0.0000019
Molybdenum	mg/L	-	0.023	0.018	0.016	0.022	0.021	0.0026
Nickel	mg/L	0.007-0.170 [2]	0.016	0.0083	0.0022	0.009	0.00074	0.0027
Phosphorus	mg/L	-	<0.10	0.17	<0.10	0.11	0.16	
Selenium	mg/L	0.002	0.00058	<0.00020	<0.00020	0.00028	<0.00020	<0.00020
Silicon	mg/L	-	3.5	3.9	3.3	3.8	3.9	
Silver	mg/L	0.0001	<0.00010	<0.00010	<0.0001	<0.00010	<0.00010	<0.00010
Strontium	mg/L	-	0.7	0.16	0.093	0.12	0.073	
Sulphur	mg/L	-	360	64	35	35	16	
Thallium	mg/L	-	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	
Tin	mg/L	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	
Titanium	mg/L	-	<0.0010	0.0095	<0.0010	0.0034	0.0015	
Uranium	mg/L	0.01	0.0096	0.0035	0.0012	0.0013	0.00054	0.00096
Vanadium	mg/L	-	0.0015	0.0040	0.0014	0.003	<0.0010	
Zinc	mg/L	0.03	<0.0030	<0.0030	<0.0030	0.004	<0.0030	<0.0030

Notes:

[1] Alberta Environment and Parks (AEP). 2019. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. 198 pp. Referenced guidelines are for fine textured soils under Agricultural land use

[2] Guideline varies with hardness

[3] Guideline varies with chloride

[4] Guideline varies with pH and temperature

[5] Guideline varies with pH

"-" No applicable guideline or not analyzed

Exceeds Regulatory Limit

Italic - Detection limit greater than Tier 1 Guideline

Table E33A: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 33A					
			May-15	Jun-16	Jun-17	Jun-18	Jun-19	Jun-20
Volatile Organic Compounds (VOCs)								
Bromodichloromethane	mg/L	-	-	-	-	-	<0.00050	
Bromoform	mg/L	-	-	-	-	-	<0.00050	
Bromomethane	mg/L	-	-	-	-	-	<0.0020	
Carbon tetrachloride	mg/L	0.002	-	-	-	-	<0.00050	<0.00050
Chlorobenzene	mg/L	0.0013	-	-	-	-	<0.00050	<0.00050
Chloroethane	mg/L	-	-	-	-	-	<0.0010	
Chloroform	mg/L	0.08	-	-	-	-	<0.00050	<0.00050
Chloromethane	mg/L	-	-	-	-	-	<0.0020	
Dibromochloromethane	mg/L	0.1	-	-	-	-	<0.0010	<0.0010
1,2-Dibromoethane	mg/L	-	-	-	-	-	<0.00020	
1,2-Dichlorobenzene	mg/L	0.0007	-	-	-	-	<0.00050	<0.00050
1,3-Dichlorobenzene	mg/L	-	-	-	-	-	<0.00050	
1,4-Dichlorobenzene	mg/L	0.001	-	-	-	-	<0.00050	<0.00050
1,1-Dichloroethane	mg/L	-	-	-	-	-	<0.00050	
1,2-Dichloroethane	mg/L	0.005	-	-	-	-	<0.00050	<0.00050
1,1-Dichloroethene	mg/L	0.014	-	-	-	-	<0.00050	<0.00050
1,2-Dichloroethene (cis)	mg/L	-	-	-	-	-	<0.00050	
1,2-Dichloroethene (trans)	mg/L	-	-	-	-	-	<0.00050	
1,2-Dichloropropane	mg/L	-	-	-	-	-	<0.00050	
1,3-Dichloropropene [cis]	mg/L	-	-	-	-	-	<0.00050	
1,3-Dichloropropene [trans]	mg/L	-	-	-	-	-	<0.00050	
Methyl t-Butyl Ether (MTBE)	mg/L	0.015	-	-	-	-	<0.00050	<0.00050
Methylene Chloride	mg/L	0.05	-	-	-	-	<0.0020	<0.0020
Methyl Methacrylate	mg/L	0.47	-	-	-	-	<0.00050	<0.00050
Styrene	mg/L	-	-	-	-	-	<0.00050	
1,1,1,2-Tetrachloroethane	mg/L	-	-	-	-	-	<0.0010	
1,1,2,2-Tetrachloroethane	mg/L	-	-	-	-	-	<0.0020	
Tetrachloroethene	mg/L	0.01	-	-	-	-	<0.00050	<0.00050
1,2,3-Trichlorobenzene	mg/L	0.008	-	-	-	-	<0.0010	<0.0010
1,2,4-Trichlorobenzene	mg/L	0.015	-	-	-	-	<0.0010	<0.0010
1,3,5-Trichlorobenzene	mg/L	0.014	-	-	-	-	<0.00050	<0.00050
1,1,1-Trichloroethane	mg/L	-	-	-	-	-	<0.00050	
1,1,2-Trichloroethane	mg/L	-	-	-	-	-	<0.00050	
Trichloroethene	mg/L	0.005	-	-	-	-	<0.00050	<0.00050
Trichlorofluoromethane	mg/L	-	-	-	-	-	<0.00050	
Trihalomethanes	mg/L	-	-	-	-	-	<0.0013	<0.0013
1,2,4-Trimethylbenzene	mg/L	-	-	-	-	-	<0.00050	
1,3,5-Trimethylbenzene	mg/L	-	-	-	-	-	<0.00050	
Vinyl chloride	mg/L	0.002	-	-	-	-	<0.00050	<0.00050

Notes:

[1] Alberta Environment and Parks (AEP). 2019. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. 198 pp. Referenced guidelines are for fine textured soils under Agricultural land use

[2] Guideline varies with hardness

[3] Guideline varies with chloride

[4] Guideline varies with pH and temperature

[5] Guideline varies with pH

"-" No applicable guideline or not analyzed

Exceeds Regulatory Limit

Italic - Detection limit greater than Tier 1 Guideline

Table E33B: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 33B					
			May-15	Jun-16	Jun-17	Jun-18	Jun-19	Jun-20
Field Measurements								
Field pH	-	-	7.5	7.48	-	7.88	7.36	7.35
Field EC	mS	-	5.18	5.34	-	5.65	5.42	5.85
Field Temperature	°C	-	6.0	6.9	-	11.6	13.0	7.6
Routine Water								
pH	-	6.5 - 8.5	7.89	8.15	7.99	7.82	7.96	7.85
Conductivity (EC)	µS/cm	1000	5000	5400	5600	5500	5600	5800
Calcium	mg/L	-	91	110	130	120	130	120
Magnesium	mg/L	-	26	38	42	39	40	40
Sodium	mg/L	200	1200	1300	1200	1300	1300	1400
Potassium	mg/L	-	6.9	6.9	6.1	6.4	6.6	6
Iron	mg/L	0.3	<0.060	0.35	<0.6	<0.060	1.6	0.66
Sulphate	mg/L	128-429 [2]	1900	2000	2100	2100	1900	2200
Chloride	mg/L	100	21	20	21	22	23	23
Bicarbonate	mg/L	-	1000	1100	1200	1300	1200	1200
Carbonate	mg/L	-	<0.50	<0.50	<0.50	<1.0	<1.0	<1.0
Hydroxide	mg/L	-	<0.50	<0.50	<0.50	<1.0	<1.0	<1.0
Nitrate (N)	mg/L	3	<0.010	<0.050	0.68	0.097	0.011	0.017
Nitrite (N)	mg/L	0.02 - 0.20 [3]	<0.010	<0.050	0.2	0.056	0.023	0.015
Nitrate and Nitrate (N)	mg/L	-	<0.010	<0.020	0.21	0.15	0.034	0.032
Total Dissolved Solids (TDS)	mg/L	500	3700	4000	4100	4200	4000	4400
Hardness	mg/L	-	340	440	490	460	490	470
Alkalinity (total as CaCO3)	mg/L	-	850	920	1000	1000	1000	1000
Alkalinity (pp as CaCO3)	mg/L	-	<0.50	<0.50	<0.50	-	<1.0	
Ionic Balance	N/A	-	1.0	1.0	0.82	1.3	2.4	4.1
Water Nutrients								
Ammonia-N	mg/L	0.018-190 [4]	0.83	0.78	0.6	0.44	0.58	0.82
TKN	mg/L	-	5.3	2.6	2.7	2.3	2.4	1.9
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	<0.00089	<0.00089	<0.00089
F1 (C6-C10)	mg/L	2.2	<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	-	280	140	150	120	150	116
TOC	mg/L	-	-	-	-	-	-	
DOC	mg/L	-	45	44	49	48	59	48
Oil & Grease	mg/L	-	-	-	-	-	-	
Metals								
Aluminum	mg/L	0.0007 / 0.05 [5]	0.0056	0.060	0.0049	0.073	0.19	0.1
Antimony	mg/L	0.006	0.0013	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic	mg/L	0.005	0.0065	0.0013	0.0014	0.0021	0.0013	0.0012
Barium	mg/L	1	0.038	0.031	<0.10	0.025	0.028	0.022
Beryllium	mg/L	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	
Boron	mg/L	1	0.23	0.28	0.25	0.27	0.29	0.25
Cadmium	mg/L	0.00004-0.00037 [2]	<0.000020	<0.000020	0.000044	0.00002	0.000020	<0.000020
Chromium	mg/L	0.05	<0.0010	0.0020	<0.0010	<0.0010	<0.0010	<0.0010
Cobalt	mg/L	-	0.0030	0.0020	0.0024	0.0026	0.0013	
Copper	mg/L	0.007	0.00037	0.0027	0.0028	0.0012	0.00038	0.00041
Lead	mg/L	0.001-0.007 [2]	<0.00020	0.00024	<0.00020	<0.00020	0.00039	0.00022
Lithium	mg/L	-	0.30	0.35	0.37	0.34	0.35	
Manganese	mg/L	0.05	0.19	0.24	0.25	0.23	0.22	0.23
Mercury	mg/L	0.000005	<0.0000050	0.00023	0.0000076	0.0000053	<0.0000020	<0.0000019
Molybdenum	mg/L	-	0.0070	0.00038	0.0008	0.00077	0.00044	
Nickel	mg/L	0.007-0.170 [2]	0.015	0.0096	0.011	0.01	0.0090	0.0099
Phosphorus	mg/L	-	<0.10	<0.10	<1.0	<0.10	<0.10	
Selenium	mg/L	0.002	0.00064	0.00038	0.00043	0.00048	0.00060	0.00046
Silicon	mg/L	-	3.9	5.0	4.6	4.9	5.0	
Silver	mg/L	0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Strontium	mg/L	-	1.6	2.1	2.3	2.3	2.1	
Sulphur	mg/L	-	610	720	690	720	730	
Thallium	mg/L	-	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	
Tin	mg/L	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	
Titanium	mg/L	-	<0.0010	0.0033	<0.0010	<0.0010	0.0066	
Uranium	mg/L	0.01	0.0021	0.00016	0.00026	0.00014	<0.00010	<0.00010
Vanadium	mg/L	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	
Zinc	mg/L	0.03	<0.0030	0.0056	<0.0030	<0.0030	<0.0030	<0.0030

Notes:

[1] Alberta Environment and Parks (AEP). 2019. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. 198 pp. Referenced guidelines are for fine textured soils under Agricultural land use

[2] Guideline varies with hardness

[3] Guideline varies with chloride

[4] Guideline varies with pH and temperature

[5] Guideline varies with pH

"-" No applicable guideline or not analyzed

Exceeds Regulatory Limit

Italic - Detection limit greater than Tier 1 Guideline

Table E33B: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 33B					
			May-15	Jun-16	Jun-17	Jun-18	Jun-19	Jun-20
Volatile Organic Compounds (VOCs)								
Bromodichloromethane	mg/L	-	-	-	-	-	<0.00050	
Bromoform	mg/L	-	-	-	-	-	<0.00050	
Bromomethane	mg/L	-	-	-	-	-	<0.0020	
Carbon tetrachloride	mg/L	0.002	-	-	-	-	<0.00050	<0.00050
Chlorobenzene	mg/L	0.0013	-	-	-	-	<0.00050	<0.00050
Chloroethane	mg/L	-	-	-	-	-	<0.0010	
Chloroform	mg/L	0.08	-	-	-	-	<0.00050	<0.00050
Chloromethane	mg/L	-	-	-	-	-	<0.0020	
Dibromochloromethane	mg/L	0.1	-	-	-	-	<0.0010	<0.0010
1,2-Dibromoethane	mg/L	-	-	-	-	-	<0.00020	
1,2-Dichlorobenzene	mg/L	0.0007	-	-	-	-	<0.00050	<0.00050
1,3-Dichlorobenzene	mg/L	-	-	-	-	-	<0.00050	
1,4-Dichlorobenzene	mg/L	0.001	-	-	-	-	<0.00050	<0.00050
1,1-Dichloroethane	mg/L	-	-	-	-	-	<0.00050	
1,2-Dichloroethane	mg/L	0.005	-	-	-	-	<0.00050	<0.00050
1,1-Dichloroethene	mg/L	0.014	-	-	-	-	<0.00050	<0.00050
1,2-Dichloroethene (cis)	mg/L	-	-	-	-	-	<0.00050	
1,2-Dichloroethene (trans)	mg/L	-	-	-	-	-	<0.00050	
1,2-Dichloropropane	mg/L	-	-	-	-	-	<0.00050	
1,3-Dichloropropene [cis]	mg/L	-	-	-	-	-	<0.00050	
1,3-Dichloropropene [trans]	mg/L	-	-	-	-	-	<0.00050	
Methyl t-Butyl Ether (MTBE)	mg/L	0.015	-	-	-	-	<0.00050	<0.00050
Methylene Chloride	mg/L	0.05	-	-	-	-	<0.0020	<0.0020
Methyl Methacrylate	mg/L	0.47	-	-	-	-	<0.00050	<0.00050
Styrene	mg/L	-	-	-	-	-	<0.00050	
1,1,1,2-Tetrachloroethane	mg/L	-	-	-	-	-	<0.0010	
1,1,2,2-Tetrachloroethane	mg/L	-	-	-	-	-	<0.0020	
Tetrachloroethene	mg/L	0.01	-	-	-	-	<0.00050	<0.00050
1,2,3-Trichlorobenzene	mg/L	0.008	-	-	-	-	<0.0010	<0.0010
1,2,4-Trichlorobenzene	mg/L	0.015	-	-	-	-	<0.0010	<0.0010
1,3,5-Trichlorobenzene	mg/L	0.014	-	-	-	-	<0.00050	<0.00050
1,1,1-Trichloroethane	mg/L	-	-	-	-	-	<0.00050	
1,1,2-Trichloroethane	mg/L	-	-	-	-	-	<0.00050	
Trichloroethene	mg/L	0.005	-	-	-	-	<0.00050	<0.00050
Trichlorofluoromethane	mg/L	-	-	-	-	-	<0.00050	
Trihalomethanes	mg/L	-	-	-	-	-	<0.0013	<0.0013
1,2,4-Trimethylbenzene	mg/L	-	-	-	-	-	<0.00050	
1,3,5-Trimethylbenzene	mg/L	-	-	-	-	-	<0.00050	
Vinyl chloride	mg/L	0.002	-	-	-	-	<0.00050	<0.00050

Notes:

[1] Alberta Environment and Parks (AEP). 2019. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. 198 pp. Referenced guidelines are for fine textured soils under Agricultural land use

[2] Guideline varies with hardness

[3] Guideline varies with chloride

[4] Guideline varies with pH and temperature

[5] Guideline varies with pH

"-" No applicable guideline or not analyzed

Exceeds Regulatory Limit

Italic - Detection limit greater than Tier 1 Guideline

Table E35-Deep: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW-35-DEEP				
			Jun-16	Jun-17	Jun-18	Jun-19	Jun-20
Field Measurements							
Field pH	-	-	8.22	8.1	7.66	7.90	7.64
Field EC	mS	-	4.90	3.92	-	5.39	5270
Field Temperature	°C	-	8.9	10	13.2	10.4	9.8
Routine Water							
pH	-	6.5 - 8.5	8.19	8.13	8.14	8.29	8.11
Conductivity (EC)	µS/cm	1000	4700	5300	5100	5300	5600
Calcium	mg/L	-	18	20	20	21	24
Magnesium	mg/L	-	2.1	2.1	2	2.0	2.4
Sodium	mg/L	200	970	1100	1100	1300	1200
Potassium	mg/L	-	3.3	3.8	3.7	3.6	3.9
Iron	mg/L	0.3	<0.060	<0.060	<0.060	<0.060	
Sulphate	mg/L	128-429 [2]	25	13	25	27	23
Chloride	mg/L	100	1100	1400	1400	1400	1500
Bicarbonate	mg/L	-	560	500	540	530	440
Carbonate	mg/L	-	<0.50	<0.50	<1.0	<1.0	<1.0
Hydroxide	mg/L	-	<0.50	<0.50	<1.0	<1.0	<1.0
Nitrate (N)	mg/L	3	0.25	<0.22	<0.02	<0.010	<0.010
Nitrite (N)	mg/L	0.02 - 0.20 [3]	<0.010	<0.16	<0.010	<0.010	<0.010
Nitrate and Nitrate (N)	mg/L	-	0.25	<0.050	<0.020	<0.014	<0.014
Total Dissolved Solids (TDS)	mg/L	500	2400	2800	2800	3000	3000
Hardness	mg/L	-	53	58	59	60	69
Alkalinity (total as CaCO3)	mg/L	-	460	410	450	430	360
Alkalinity (pp as CaCO3)	mg/L	-	<0.50	<0.50	-	<1.0	-
Ionic Balance	N/A	-	1.0	2.3	1.7	9.5	2.7
Water Nutrients		-	-	-	-	-	
Ammonia-N	mg/L	0.018-190 [4]	1.1	1.2	1	1.1	1.5
TKN	mg/L	-	2.2	2.5	2.2	1.8	2
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	<0.00089	<0.00089	<0.00089
F1 (C6-C10)	mg/L	2.2	<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
Organics							
COD	mg/L	-	110	130	100	110	144
TOC	mg/L	-	-	-	-	-	-
DOC	mg/L	-	18	-	19	19	29
Oil & Grease	mg/L	-	-	-	-	-	-
Metals							
Aluminum	mg/L	0.0007 / 0.05 [5]	0.017	0.0031	0.0034	0.0044	0.0054
Antimony	mg/L	0.006	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic	mg/L	0.005	0.0018	0.00081	0.00089	0.00092	0.00087
Barium	mg/L	1	0.27	0.41	0.38	0.39	0.42
Beryllium	mg/L	-	<0.0010	<0.0010	<0.0010	<0.0010	-
Boron	mg/L	1	0.69	0.75	0.81	0.75	0.78
Cadmium	mg/L	0.00004-0.00037 [2]	0.000040	<0.000020	<0.000020	0.000040	<0.000020
Chromium	mg/L	0.05	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Cobalt	mg/L	-	0.00069	0.00052	0.00051	0.00051	-
Copper	mg/L	0.007	0.00094	0.00048	0.00079	0.00034	<0.00020
Lead	mg/L	0.001-0.007 [2]	<0.00020	<0.00020	<0.00020	<0.00020	-
Lithium	mg/L	-	0.15	0.19	0.17	0.17	-
Manganese	mg/L	0.05	0.048	0.053	0.061	0.082	0.12
Mercury	mg/L	0.000005	0.0000020	<0.0000020	<0.0000020	<0.0000020	<0.0000019
Molybdenum	mg/L	-	0.021	0.017	0.02	0.018	-
Nickel	mg/L	0.007-0.170 [2]	0.0038	0.0013	0.0017	0.0017	0.0018
Phosphorus	mg/L	-	<0.10	<0.10	<0.10	<0.10	-
Selenium	mg/L	0.002	0.00020	<0.00020	0.0003	<0.00020	<0.00020
Silicon	mg/L	-	3.5	3.6	3.6	3.7	-
Silver	mg/L	0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Strontium	mg/L	-	0.36	0.5	0.45	0.50	-
Sulphur	mg/L	-	9.2	4.6	8	8.2	-
Thallium	mg/L	-	<0.00020	<0.00020	<0.00020	<0.00020	-
Tin	mg/L	-	<0.0010	0.0013	<0.0010	<0.0010	-
Titanium	mg/L	-	<0.0010	<0.0010	<0.0010	<0.0010	-
Uranium	mg/L	0.01	0.0023	0.00064	0.00075	0.00078	0.00081
Vanadium	mg/L	-	<0.0010	<0.0010	<0.0010	<0.0010	-
Zinc	mg/L	0.03	<0.0030	0.16	0.48	0.030	<0.0030

Notes:

[1] Alberta Environment and Parks (AEP). 2019. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. 198 pp. Referenced guidelines are for fine textured soils under Agricultural land use

[2] Guideline varies with hardness

[3] Guideline varies with chloride

[4] Guideline varies with pH and temperature

[5] Guideline varies with pH

"-" No applicable guideline or not analyzed

Exceeds Regulatory Limit

Italic - Detection limit greater than Tier 1 Guideline

Table E35-Deep: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW-35-DEEP				
			Jun-16	Jun-17	Jun-18	Jun-19	Jun-20
Volatile Organic Compounds (VOCs)							
Bromodichloromethane	mg/L	-	-	-	-	<0.00050	-
Bromoform	mg/L	-	-	-	-	<0.00050	-
Bromomethane	mg/L	-	-	-	-	<0.0020	-
Carbon tetrachloride	mg/L	0.002	-	-	-	<0.00050	<0.00050
Chlorobenzene	mg/L	0.0013	-	-	-	<0.00050	<0.00050
Chloroethane	mg/L	-	-	-	-	<0.0010	-
Chloroform	mg/L	0.08	-	-	-	<0.00050	<0.00050
Chloromethane	mg/L	-	-	-	-	<0.0020	-
Dibromochloromethane	mg/L	0.1	-	-	-	<0.0010	<0.0010
1,2-Dibromoethane	mg/L	-	-	-	-	<0.00020	-
1,2-Dichlorobenzene	mg/L	0.0007	-	-	-	<0.00050	<0.00050
1,3-Dichlorobenzene	mg/L	-	-	-	-	<0.00050	-
1,4-Dichlorobenzene	mg/L	0.001	-	-	-	<0.00050	<0.00050
1,1-Dichloroethane	mg/L	-	-	-	-	<0.00050	-
1,2-Dichloroethane	mg/L	0.005	-	-	-	<0.00050	-
1,1-Dichloroethene	mg/L	0.014	-	-	-	<0.00050	<0.00050
1,2-Dichloroethene (cis)	mg/L	-	-	-	-	<0.00050	-
1,2-Dichloroethene (trans)	mg/L	-	-	-	-	<0.00050	-
1,2-Dichloropropane	mg/L	-	-	-	-	<0.00050	-
1,3-Dichloropropene [cis]	mg/L	-	-	-	-	<0.00050	-
1,3-Dichloropropene [trans]	mg/L	-	-	-	-	<0.00050	-
Methyl t-Butyl Ether (MTBE)	mg/L	0.015	-	-	-	<0.00050	<0.00050
Methylene Chloride	mg/L	0.05	-	-	-	<0.0020	<0.0020
Methyl Methacrylate	mg/L	0.47	-	-	-	<0.00050	<0.00050
Styrene	mg/L	-	-	-	-	<0.00050	-
1,1,1,2-Tetrachloroethane	mg/L	-	-	-	-	<0.0010	-
1,1,2,2-Tetrachloroethane	mg/L	-	-	-	-	<0.0020	-
Tetrachloroethene	mg/L	0.01	-	-	-	<0.00050	<0.00050
1,2,3-Trichlorobenzene	mg/L	0.008	-	-	-	<0.0010	<0.0010
1,2,4-Trichlorobenzene	mg/L	0.015	-	-	-	<0.0010	<0.0010
1,3,5-Trichlorobenzene	mg/L	0.014	-	-	-	<0.00050	<0.00050
1,1,1-Trichloroethane	mg/L	-	-	-	-	<0.00050	-
1,1,2-Trichloroethane	mg/L	-	-	-	-	<0.00050	-
Trichloroethene	mg/L	0.005	-	-	-	<0.00050	<0.00050
Trichlorofluoromethane	mg/L	-	-	-	-	<0.00050	-
Trihalomethanes	mg/L	-	-	-	-	<0.0013	<0.0013
1,2,4-Trimethylbenzene	mg/L	-	-	-	-	<0.00050	-
1,3,5-Trimethylbenzene	mg/L	-	-	-	-	<0.00050	-
Vinyl chloride	mg/L	0.002	-	-	-	<0.00050	<0.00050

Notes:

[1] Alberta Environment and Parks (AEP). 2019. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. 198 pp. Referenced guidelines are for fine textured soils under Agricultural land use

[2] Guideline varies with hardness

[3] Guideline varies with chloride

[4] Guideline varies with pH and temperature

[5] Guideline varies with pH

"-" No applicable guideline or not analyzed

Exceeds Regulatory Limit

Italic - Detection limit greater than Tier 1 Guideline

Table E35A: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW-35A				
			Jun-16	Jun-17	Jun-18	Jun-19	Jun-20
Field Measurements							
Field pH	-	-	-	-	-	8.6	
Field EC	mS	-	-	-	-	1.992	
Field Temperature	℃	-	-	-	-	12.5	
Routine Water							
pH	-	6.5 - 8.5	8.60	8.61	8.44	-	8.47
Conductivity (EC)	µS/cm	1000	1500	1600	1600	-	1700
Calcium	mg/L	-	3.8	3.6	3.6	-	3.4
Magnesium	mg/L	-	0.36	0.34	0.32	-	0.3
Sodium	mg/L	200	370	390	410	-	450
Potassium	mg/L	-	2.2	3.1	2.2	-	1.9
Iron	mg/L	0.3	0.11	<0.060	0.28	-	0.069
Sulphate	mg/L	128-429 [2]	41	21	17	-	16
Chloride	mg/L	100	36	36	40	-	40
Bicarbonate	mg/L	-	900	960	1000	-	960
Carbonate	mg/L	-	26	23	16	-	18
Hydroxide	mg/L	-	<0.50	<0.50	<1.0	-	<1.0
Nitrate (N)	mg/L	3	<0.010	<0.044	<0.020	-	<0.010
Nitrite (N)	mg/L	0.02 - 0.20 [3]	<0.010	<0.033	<0.010	-	<0.010
Nitrate and Nitrate (N)	mg/L	-	<0.020	<0.010	<0.020	-	<0.014
Total Dissolved Solids (TDS)	mg/L	500	930	950	990	-	1000
Hardness	mg/L	-	11	10	10	-	9.7
Alkalinity (total as CaCO3)	mg/L	-	780	830	860	-	820
Alkalinity (pp as CaCO3)	mg/L	-	22	19	-	-	
Ionic Balance	N/A	-	0.95	2.4	1.2	-	5.6
Water Nutrients							
Ammonia-N	mg/L	0.018-190 [4]	0.83	-	0.33	0.68	0.37
TKN	mg/L	-	12	-	7	3.7	3.4
Hydrocarbons							
Benzene	mg/L	0.005	<0.00040	0.00049	0.003	<0.00040	-
Toluene	mg/L	0.024	<0.00040	<0.00040	<0.00040	<0.00040	-
Ethylbenzene	mg/L	0.0016	<0.00040	<0.00040	<0.00040	<0.00040	-
Xylene	mg/L	0.02	<0.00080	<0.00080	<0.00089	<0.00089	-
F1 (C6-C10)	mg/L	2.2	<0.10	<0.10	<0.10	<0.10	-
F2 (>C10-C16)	mg/L	1.1	<0.27	<0.27	-	<0.10	-
Organics							
COD	mg/L	-	1100	-	310	140	
TOC	mg/L	-	-	-	-	-	
DOC	mg/L	-	15	-	-	-	18
Oil & Grease	mg/L	-	-	-	-	-	
Metals							
Aluminum	mg/L	0.0007 / 0.05 [5]	0.092	0.055	0.12	-	0.0076
Antimony	mg/L	0.006	<0.00060	<0.00060	<0.00060	-	<0.00060
Arsenic	mg/L	0.005	0.0035	0.0023	0.0015	-	0.0011
Barium	mg/L	1	0.080	0.13	0.084	-	
Beryllium	mg/L	-	<0.0010	<0.0010	<0.0010	-	0.078
Boron	mg/L	1	0.75	0.74	0.79	-	0.82
Cadmium	mg/L	0.00004-0.00037 [2]	<0.000020	<0.000020	<0.000020	-	<0.000020
Chromium	mg/L	0.05	<0.0010	<0.0010	<0.0010	-	<0.0010
Cobalt	mg/L	-	0.00042	0.00035	0.00035	-	
Copper	mg/L	0.007	0.0011	0.00065	0.0022	-	0.0025
Lead	mg/L	0.001-0.007 [2]	<0.00020	<0.00020	<0.00020	-	<0.00020
Lithium	mg/L	-	0.068	0.069	0.074	-	
Manganese	mg/L	0.05	0.012	0.013	0.028	-	0.017
Mercury	mg/L	0.000005	<0.000020	<0.0000020	-	-	<0.0000019
Molybdenum	mg/L	-	0.020	0.016	0.016	-	
Nickel	mg/L	0.007-0.170 [2]	0.0053	0.0034	0.0016	-	0.0017
Phosphorus	mg/L	-	0.15	1.2	0.58	-	
Selenium	mg/L	0.002	<0.00020	<0.00020	<0.00020	-	0.00026
Silicon	mg/L	-	3.7	3.5	4.4	-	
Silver	mg/L	0.0001	<0.00010	<0.00010	<0.00010	-	<0.00010
Strontium	mg/L	-	0.076	0.086	0.081	-	
Sulphur	mg/L	-	11	5.9	5.4	-	
Thallium	mg/L	-	<0.00020	<0.00020	<0.00020	-	
Tin	mg/L	-	<0.0010	<0.0010	<0.0010	-	
Titanium	mg/L	-	0.0015	<0.0010	0.0028	-	
Uranium	mg/L	0.01	0.0013	0.00095	0.00073	-	0.00076
Vanadium	mg/L	-	0.0014	0.0012	0.0015	-	
Zinc	mg/L	0.03	0.0035	<0.0030	<0.0030	-	<0.0030

Notes:

[1] Alberta Environment and Parks (AEP). 2019. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. 198 pp. Referenced guidelines are for fine textured soils under Agricultural land use

[2] Guideline varies with hardness

[3] Guideline varies with chloride

[4] Guideline varies with pH and temperature

[5] Guideline varies with pH

"-" No applicable guideline or not analyzed

Exceeds Regulatory Limit

Italic - Detection limit greater than Tier 1 Guideline

Table E35A: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW-35A				
			Jun-16	Jun-17	Jun-18	Jun-19	Jun-20
Volatile Organic Compounds (VOCs)							
Bromodichloromethane	mg/L	-	-	-	-	<0.00050	-
Bromoform	mg/L	-	-	-	-	<0.00050	-
Bromomethane	mg/L	-	-	-	-	<0.0020	-
Carbon tetrachloride	mg/L	0.002	-	-	-	<0.00050	-
Chlorobenzene	mg/L	0.0013	-	-	-	<0.00050	-
Chloroethane	mg/L	-	-	-	-	<0.0010	-
Chloroform	mg/L	0.08	-	-	-	<0.00050	-
Chloromethane	mg/L	-	-	-	-	<0.0020	-
Dibromochloromethane	mg/L	0.1	-	-	-	<0.0010	-
1,2-Dibromoethane	mg/L	-	-	-	-	<0.00020	-
1,2-Dichlorobenzene	mg/L	0.0007	-	-	-	<0.00050	-
1,3-Dichlorobenzene	mg/L	-	-	-	-	<0.00050	-
1,4-Dichlorobenzene	mg/L	0.001	-	-	-	<0.00050	-
1,1-Dichloroethane	mg/L	-	-	-	-	<0.00050	-
1,2-Dichloroethane	mg/L	0.005	-	-	-	<0.00050	-
1,1-Dichloroethene	mg/L	0.014	-	-	-	<0.00050	-
1,2-Dichloroethene (cis)	mg/L	-	-	-	-	<0.00050	-
1,2-Dichloroethene (trans)	mg/L	-	-	-	-	<0.00050	-
1,2-Dichloropropane	mg/L	-	-	-	-	<0.00050	-
1,3-Dichloropropene [cis]	mg/L	-	-	-	-	<0.00050	-
1,3-Dichloropropene [trans]	mg/L	-	-	-	-	<0.00050	-
Methyl t-Butyl Ether (MTBE)	mg/L	0.015	-	-	-	<0.00050	-
Methylene Chloride	mg/L	0.05	-	-	-	<0.0020	-
Methyl Methacrylate	mg/L	0.47	-	-	-	<0.00050	-
Styrene	mg/L	-	-	-	-	<0.00050	-
1,1,1,2-Tetrachloroethane	mg/L	-	-	-	-	<0.0010	-
1,1,2,2-Tetrachloroethane	mg/L	-	-	-	-	<0.0020	-
Tetrachloroethene	mg/L	0.01	-	-	-	<0.00050	-
1,2,3-Trichlorobenzene	mg/L	0.008	-	-	-	<0.0010	-
1,2,4-Trichlorobenzene	mg/L	0.015	-	-	-	<0.0010	-
1,3,5-Trichlorobenzene	mg/L	0.014	-	-	-	<0.00050	-
1,1,1-Trichloroethane	mg/L	-	-	-	-	<0.00050	-
1,1,2-Trichloroethane	mg/L	-	-	-	-	<0.00050	-
Trichloroethene	mg/L	0.005	-	-	-	<0.00050	-
Trichlorofluoromethane	mg/L	-	-	-	-	<0.00050	-
Trihalomethanes	mg/L	-	-	-	-	<0.0013	-
1,2,4-Trimethylbenzene	mg/L	-	-	-	-	<0.00050	-
1,3,5-Trimethylbenzene	mg/L	-	-	-	-	<0.00050	-
Vinyl chloride	mg/L	0.002	-	-	-	<0.00050	-

Notes:

[1] Alberta Environment and Parks (AEP). 2019. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. 198 pp. Referenced guidelines are for fine textured soils under Agricultural land use

[2] Guideline varies with hardness
[3] Guideline varies with chloride
[4] Guideline varies with pH and temperature
[5] Guideline varies with pH
"-" No applicable guideline or not analyzed
Exceeds Regulatory Limit
Italic - Detection limit greater than Tier 1 Guideline

Table E35B: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW-35B				
			Jun-16	Jun-17	Jun-18	Jun-19	Jun-20
Field Measurements							
Field pH	-	-	7.83	7.8	7.05	7.70	7.70
Field EC	mS	-	8.08	7.27	8.53	7.97	7.41
Field Temperature	℃	-	7.6	8	7.1	9.9	7.5
Routine Water							
pH	-	6.5 - 8.5	8.16	8.22	8.12	8.27	8.21
Conductivity (EC)	µS/cm	1000	7700	7600	7700	7800	7800
Calcium	mg/L	-	99	98	110	120	6100
Magnesium	mg/L	-	14	14	15	16	15
Sodium	mg/L	200	1800	1800	2000	2100	2000
Potassium	mg/L	-	7.8	8.6	8.4	9.1	7.8
Iron	mg/L	0.3	<0.60	<0.60	<0.60	*<0.60*	*<0.60*
Sulphate	mg/L	128-429 [2]	3700	3300	3500	3400	3600
Chloride	mg/L	100	5.2	6.8	6.3	6.3	6.6
Bicarbonate	mg/L	-	790	780	830	820	780
Carbonate	mg/L	-	<0.50	<0.50	<1.0	<1.0	<1.0
Hydroxide	mg/L	-	<0.50	<0.50	<1.0	<1.0	<1.0
Nitrate (N)	mg/L	3	0.42	2.5	0.76	1.6	1.5
Nitrite (N)	mg/L	0.02 - 0.20 [3]	<0.010	<0.16	<0.01	0.019	0.026
Nitrate and Nitrate (N)	mg/L	-	0.42	-	0.76	1.6	1.5
Total Dissolved Solids (TDS)	mg/L	500	6000	5700	6000	6100	6100
Hardness	mg/L	-	300	300	330	360	340
Alkalinity (total as CaCO3)	mg/L	-	650	640	680	680	640
Alkalinity (pp as CaCO3)	mg/L	-	<0.50	<0.50	-	<1.0	
Ionic Balance	N/A	-	0.95	2.3	2.8	8.0	2.7
Water Nutrients							
Ammonia-N	mg/L	0.018-190 [4]	1.9	2	1.3	1.2	1.1
TKN	mg/L	-	2.7	2.5	2	1.7	1.5
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	0.0004	0.0004
Ethylbenzene	mg/L	0.0016	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	<0.00080	<0.00080	<0.00089	<0.00089	<0.00089
F1 (C6-C10)	mg/L	2.2	<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
Organics							
COD	mg/L	-	37	66	33	37	28
TOC	mg/L	-	-	-	-	-	
DOC	mg/L	-	8.2	12	10	10	8.9
Oil & Grease	mg/L	-	-	-	-	-	
Metals							
Aluminum	mg/L	0.0007 / 0.05 [5]	0.012	0.0035	0.0047	0.0032	0.0032
Antimony	mg/L	0.006	0.00069	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic	mg/L	0.005	0.0019	0.0014	0.0011	0.0011	0.0011
Barium	mg/L	1	<0.10	<0.1	<0.10	<0.10	<0.10
Beryllium	mg/L	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Boron	mg/L	1	0.70	0.71	0.82	0.84	0.84
Cadmium	mg/L	0.00004-0.00037 [2]	<0.000020	0.000022	<0.000020	0.000065	0.000065
Chromium	mg/L	0.05	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Cobalt	mg/L	-	0.00065	0.00054	0.00032	0.00037	0.00037
Copper	mg/L	0.007	0.0018	0.0032	0.0016	0.0026	0.0026
Lead	mg/L	0.001-0.007 [2]	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Lithium	mg/L	-	0.50	0.52	0.55	0.66	0.66
Manganese	mg/L	0.05	0.066	0.074	0.049	0.049	0.049
Mercury	mg/L	0.000005	<0.0000020	<0.0000020	0.0000027	<0.0000020	<0.0000020
Molybdenum	mg/L	-	0.0055	0.0041	0.0031	0.0031	0.0031
Nickel	mg/L	0.007-0.170 [2]	0.0041	0.0036	0.0028	0.0033	0.0033
Phosphorus	mg/L	-	<1.0	<1.0	<1.0	<1.0	<1.0
Selenium	mg/L	0.002	0.00082	0.00053	0.00034	0.00049	0.00049
Silicon	mg/L	-	3.1	3.1	3.3	3.5	3.5
Silver	mg/L	0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Strontium	mg/L	-	2.2	2.3	2.6	2.5	2.5
Sulphur	mg/L	-	1200	1200	1200	1300	1300
Thallium	mg/L	-	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Tin	mg/L	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Titanium	mg/L	-	<0.0010	<0.0010	<0.0010	0.0011	0.0011
Uranium	mg/L	0.01	0.0023	0.0015	0.001	0.0010	0.0010
Vanadium	mg/L	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Zinc	mg/L	0.03	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030

Notes:

[1] Alberta Environment and Parks (AEP). 2019. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. 198 pp. Referenced guidelines are for fine textured soils under Agricultural land use

[2] Guideline varies with hardness

[3] Guideline varies with chloride

[4] Guideline varies with pH and temperature

[5] Guideline varies with pH

"-" No applicable guideline or not analyzed

Exceeds Regulatory Limit

Italic - Detection limit greater than Tier 1 Guideline

Table E35B: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW-35B				
			Jun-16	Jun-17	Jun-18	Jun-19	Jun-20
Volatile Organic Compounds (VOCs)							
Bromodichloromethane	mg/L	-	-	-	-	<0.00050	
Bromoform	mg/L	-	-	-	-	<0.00050	
Bromomethane	mg/L	-	-	-	-	<0.0020	
Carbon tetrachloride	mg/L	0.002	-	-	-	<0.00050	<0.00050
Chlorobenzene	mg/L	0.0013	-	-	-	<0.00050	<0.00050
Chloroethane	mg/L	-	-	-	-	<0.0010	
Chloroform	mg/L	0.08	-	-	-	<0.00050	<0.00050
Chloromethane	mg/L	-	-	-	-	<0.0020	
Dibromochloromethane	mg/L	0.1	-	-	-	<0.0010	<0.0010
1,2-Dibromoethane	mg/L	-	-	-	-	<0.00020	
1,2-Dichlorobenzene	mg/L	0.0007	-	-	-	<0.00050	<0.00050
1,3-Dichlorobenzene	mg/L	-	-	-	-	<0.00050	
1,4-Dichlorobenzene	mg/L	0.001	-	-	-	<0.00050	<0.00050
1,1-Dichloroethane	mg/L	-	-	-	-	<0.00050	
1,2-Dichloroethane	mg/L	0.005	-	-	-	<0.00050	<0.00050
1,1-Dichloroethene	mg/L	0.014	-	-	-	<0.00050	<0.00050
1,2-Dichloroethene (cis)	mg/L	-	-	-	-	<0.00050	
1,2-Dichloroethene (trans)	mg/L	-	-	-	-	<0.00050	
1,2-Dichloropropane	mg/L	-	-	-	-	<0.00050	
1,3-Dichloropropene [cis]	mg/L	-	-	-	-	<0.00050	
1,3-Dichloropropene [trans]	mg/L	-	-	-	-	<0.00050	
Methyl t-Butyl Ether (MTBE)	mg/L	0.015	-	-	-	<0.00050	<0.00050
Methylene Chloride	mg/L	0.05	-	-	-	<0.0020	<0.0020
Methyl Methacrylate	mg/L	0.47	-	-	-	<0.00050	<0.00050
Styrene	mg/L	-	-	-	-	<0.00050	
1,1,1,2-Tetrachloroethane	mg/L	-	-	-	-	<0.0010	
1,1,2,2-Tetrachloroethane	mg/L	-	-	-	-	<0.0020	
Tetrachloroethene	mg/L	0.01	-	-	-	<0.00050	<0.00050
1,2,3-Trichlorobenzene	mg/L	0.008	-	-	-	<0.0010	<0.0010
1,2,4-Trichlorobenzene	mg/L	0.015	-	-	-	<0.0010	<0.0010
1,3,5-Trichlorobenzene	mg/L	0.014	-	-	-	<0.00050	<0.00050
1,1,1-Trichloroethane	mg/L	-	-	-	-	<0.00050	
1,1,2-Trichloroethane	mg/L	-	-	-	-	<0.00050	
Trichloroethene	mg/L	0.005	-	-	-	<0.00050	<0.00050
Trichlorofluoromethane	mg/L	-	-	-	-	<0.00050	
Trihalomethanes	mg/L	-	-	-	-	<0.0013	<0.0013
1,2,4-Trimethylbenzene	mg/L	-	-	-	-	<0.00050	
1,3,5-Trimethylbenzene	mg/L	-	-	-	-	<0.00050	
Vinyl chloride	mg/L	0.002	-	-	-	<0.00050	<0.00050

Notes:

[1] Alberta Environment and Parks (AEP). 2019. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. 198 pp. Referenced guidelines are for fine textured soils under Agricultural land use

[2] Guideline varies with hardness
[3] Guideline varies with chloride
[4] Guideline varies with pH and temperature
[5] Guideline varies with pH
"-" No applicable guideline or not analyzed
Exceeds Regulatory Limit
Italic - Detection limit greater than Tier 1 Guideline

Table E36-Deep: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW-36-DEEP				
			Jun-16	Jun-17	Jun-18	Jun-19	Jun-20
Field Measurements							
Field pH	-	-	8.52	8	7.38	8.05	7.78
Field EC	mS	-	3.83	4.84	4.9	5.28	4760
Field Temperature	℃	-	7.7	10.3	10.9	12.3	11.4
Routine Water							
pH	-	6.5 - 8.5	8.51	8.33	8.19	8.39	8.32
Conductivity (EC)	µS/cm	1000	3600	4800	4700	4800	4800
Calcium	mg/L	-	17	18	18	18	19
Magnesium	mg/L	-	2.4	2.1	2	1.9	2.1
Sodium	mg/L	200	800	1100	1100	1100	1100
Potassium	mg/L	-	5.4	3.9	3.7	3.7	3.6
Iron	mg/L	0.3	0.41	<0.060	<0.060	<0.060	
Sulphate	mg/L	128-429 [2]	46	11	10	11	12
Chloride	mg/L	100	770	1100	1000	980	1100
Bicarbonate	mg/L	-	650	940	960	900	910
Carbonate	mg/L	-	13	3.1	<1.0	16	3.8
Hydroxide	mg/L	-	<0.50	<0.50	<1.0	<1.0	<1.0
Nitrate (N)	mg/L	3	0.018	<0.044	<0.020	<0.010	<0.010
Nitrite (N)	mg/L	0.02 - 0.20 [3]	0.043	<0.033	<0.010	<0.010	<0.010
Nitrate and Nitrate (N)	mg/L	-	0.061	<0.01	<0.020	<0.014	<0.014
Total Dissolved Solids (TDS)	mg/L	500	2000	2600	2600	2500	2700
Hardness	mg/L	-	52	53	53	52	57
Alkalinity (total as CaCO3)	mg/L	-	550	770	780	770	750
Alkalinity (pp as CaCO3)	mg/L	-	11	2.6	-	13	-
Ionic Balance	N/A	-	1.1	2.3	2.6	4.7	3
Water Nutrients							
Ammonia-N	mg/L	0.018-190 [4]	0.92	1.3	1.3	1.3	1.3
TKN	mg/L	-	1.9	2.6	2.8	2.1	1.9
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	<0.00089	<0.00089	<0.00089
F1 (C6-C10)	mg/L	2.2	<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
Organics							
COD	mg/L	-	99	140	130	140	144
TOC	mg/L	-	-	-	-	-	-
DOC	mg/L	-	12	-	35	33	33
Oil & Grease	mg/L	-	-	-	-	-	-
Metals							
Aluminum	mg/L	0.0007 / 0.05 [5]	0.19	0.0069	0.0039	0.0059	0.0034
Antimony	mg/L	0.006	0.0030	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic	mg/L	0.005	0.0088	0.0024	0.0025	0.0020	0.0019
Barium	mg/L	1	0.23	0.32	0.32	0.34	0.37
Beryllium	mg/L	-	<0.0010	<0.0010	<0.0010	<0.0010	-
Boron	mg/L	1	0.71	0.97	1	1.0	1.0
Cadmium	mg/L	0.00004-0.00037 [2]	0.000070	<0.000020	<0.000020	<0.000020	<0.000020
Chromium	mg/L	0.05	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Cobalt	mg/L	-	0.00082	0.0012	0.001	0.0010	-
Copper	mg/L	0.007	0.011	0.0006	0.00085	0.00029	<0.00020
Lead	mg/L	0.001-0.007 [2]	0.00094	<0.00020	<0.00020	<0.00020	-
Lithium	mg/L	-	0.11	0.19	0.18	0.19	-
Manganese	mg/L	0.05	0.030	0.071	0.072	0.13	0.58
Mercury	mg/L	0.000005	0.00019	<0.0000020	<0.0000020	<0.0000020	<0.0000019
Molybdenum	mg/L	-	0.041	0.011	0.014	0.013	-
Nickel	mg/L	0.007-0.170 [2]	0.0086	0.0046	0.005	0.0046	0.0052
Phosphorus	mg/L	-	0.13	<0.10	<0.10	<0.10	-
Selenium	mg/L	0.002	0.00096	0.0003	0.00064	<0.00020	<0.00020
Silicon	mg/L	-	2.6	3.6	3.6	3.5	-
Silver	mg/L	0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Strontium	mg/L	-	0.34	0.46	0.4	0.42	-
Sulphur	mg/L	-	17	3.3	3.5	3.7	-
Thallium	mg/L	-	<0.00020	<0.00020	<0.00020	<0.00020	-
Tin	mg/L	-	<0.0010	0.003	0.0064	0.0025	-
Titanium	mg/L	-	0.0030	<0.0010	<0.0010	<0.0010	-
Uranium	mg/L	0.01	0.0066	0.0016	0.0016	0.0015	0.0016
Vanadium	mg/L	-	0.0078	<0.0010	<0.0010	<0.0010	-
Zinc	mg/L	0.03	0.0068	0.1	0.11	0.010	<0.0030

Notes:

[1] Alberta Environment and Parks (AEP). 2019. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. 198 pp. Referenced guidelines are for fine textured soils under Agricultural land use

[2] Guideline varies with hardness

[3] Guideline varies with chloride

[4] Guideline varies with pH and temperature

[5] Guideline varies with pH

"-" No applicable guideline or not analyzed

Exceeds Regulatory Limit

Italic - Detection limit greater than Tier 1 Guideline

Table E36-Deep: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW-36-DEEP				
			Jun-16	Jun-17	Jun-18	Jun-19	Jun-20
Volatile Organic Compounds (VOCs)							
Bromodichloromethane	mg/L	-	-	-	-	<0.00050	-
Bromoform	mg/L	-	-	-	-	<0.00050	-
Bromomethane	mg/L	-	-	-	-	<0.0020	-
Carbon tetrachloride	mg/L	0.002	-	-	-	<0.00050	<0.00050
Chlorobenzene	mg/L	0.0013	-	-	-	<0.00050	<0.00050
Chloroethane	mg/L	-	-	-	-	<0.0010	-
Chloroform	mg/L	0.08	-	-	-	<0.00050	<0.00050
Chloromethane	mg/L	-	-	-	-	<0.0020	-
Dibromochloromethane	mg/L	0.1	-	-	-	<0.0010	<0.0010
1,2-Dibromoethane	mg/L	-	-	-	-	<0.00020	-
1,2-Dichlorobenzene	mg/L	0.0007	-	-	-	<0.00050	<0.00050
1,3-Dichlorobenzene	mg/L	-	-	-	-	<0.00050	-
1,4-Dichlorobenzene	mg/L	0.001	-	-	-	<0.00050	<0.00050
1,1-Dichloroethane	mg/L	-	-	-	-	<0.00050	-
1,2-Dichloroethane	mg/L	0.005	-	-	-	<0.00050	-
1,1-Dichloroethene	mg/L	0.014	-	-	-	<0.00050	<0.00050
1,2-Dichloroethene (cis)	mg/L	-	-	-	-	<0.00050	-
1,2-Dichloroethene (trans)	mg/L	-	-	-	-	<0.00050	-
1,2-Dichloropropane	mg/L	-	-	-	-	<0.00050	-
1,3-Dichloropropene [cis]	mg/L	-	-	-	-	<0.00050	-
1,3-Dichloropropene [trans]	mg/L	-	-	-	-	<0.00050	-
Methyl t-Butyl Ether (MTBE)	mg/L	0.015	-	-	-	<0.00050	<0.00050
Methylene Chloride	mg/L	0.05	-	-	-	<0.0020	<0.0020
Methyl Methacrylate	mg/L	0.47	-	-	-	<0.00050	<0.00050
Styrene	mg/L	-	-	-	-	<0.00050	-
1,1,1,2-Tetrachloroethane	mg/L	-	-	-	-	<0.0010	-
1,1,2,2-Tetrachloroethane	mg/L	-	-	-	-	<0.0020	-
Tetrachloroethene	mg/L	0.01	-	-	-	<0.00050	<0.00050
1,2,3-Trichlorobenzene	mg/L	0.008	-	-	-	<0.0010	<0.0010
1,2,4-Trichlorobenzene	mg/L	0.015	-	-	-	<0.0010	<0.0010
1,3,5-Trichlorobenzene	mg/L	0.014	-	-	-	<0.00050	<0.00050
1,1,1-Trichloroethane	mg/L	-	-	-	-	<0.00050	-
1,1,2-Trichloroethane	mg/L	-	-	-	-	<0.00050	-
Trichloroethene	mg/L	0.005	-	-	-	<0.00050	<0.00050
Trichlorofluoromethane	mg/L	-	-	-	-	<0.00050	-
Trihalomethanes	mg/L	-	-	-	-	<0.0013	<0.0013
1,2,4-Trimethylbenzene	mg/L	-	-	-	-	<0.00050	-
1,3,5-Trimethylbenzene	mg/L	-	-	-	-	<0.00050	-
Vinyl chloride	mg/L	0.002	-	-	-	<0.00050	<0.00050

Notes:

[1] Alberta Environment and Parks (AEP). 2019. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. 198 pp. Referenced guidelines are for fine textured soils under Agricultural land use

[2] Guideline varies with hardness
[3] Guideline varies with chloride
[4] Guideline varies with pH and temperature
[5] Guideline varies with pH
"-" No applicable guideline or not analyzed
Exceeds Regulatory Limit
Italic - Detection limit greater than Tier 1 Guideline

Table E36A: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW-36A				
			Jun-16	Jun-17	Jun-18	Jun-19	Jun-20
Field Measurements							
Field pH	-	-	8.87	8.8	8.57	8.73	8.6
Field EC	mS	-	1.588	1.633	1.609	1.68	1.57
Field Temperature	℃	-	9.1	6.5	9.2	9.9	7.8
Routine Water							
pH	-	6.5 - 8.5	8.66	8.52	8.52	8.71	8.55
Conductivity (EC)	µS/cm	1000	1600	1600	1600	1600	1600
Calcium	mg/L	-	3.9	3.3	3.2	3.2	960
Magnesium	mg/L	-	0.41	0.32	0.33	0.23	0.42
Sodium	mg/L	200	390	380	410	380	440
Potassium	mg/L	-	1.4	1.3	1.4	1.5	1.4
Iron	mg/L	0.3	<0.060	<0.060	<0.060	0.076	0.1
Sulphate	mg/L	128-429 [2]	<1.0	2.9	<1.0	1.8	<1.0
Chloride	mg/L	100	7.4	7.1	7.1	8.9	8.2
Bicarbonate	mg/L	-	970	1000	1000	960	980
Carbonate	mg/L	-	25	18	24	58	26
Hydroxide	mg/L	-	<0.50	<0.50	<1.0	<1.0	<1.0
Nitrate (N)	mg/L	3	<0.010	<0.044	<0.020	0.018	<0.010
Nitrite (N)	mg/L	0.02 - 0.20 [3]	<0.010	<0.033	<0.010	<0.010	<0.010
Nitrate and Nitrate (N)	mg/L	-	<0.020	<0.010	<0.020	0.018	<0.014
Total Dissolved Solids (TDS)	mg/L	500	900	930	960	930	960
Hardness	mg/L	-	12	9.5	9.3	9	11
Alkalinity (total as CaCO3)	mg/L	-	830	880	900	890	840
Alkalinity (pp as CaCO3)	mg/L	-	21	15	-	48	
Ionic Balance	N/A	-	1.0	2.7	0.69	3.0	6.2
Water Nutrients							
Ammonia-N	mg/L	0.018-190 [4]	0.60	0.52	0.63	0.69	0.6
TKN	mg/L	-	1.3	1.2	1	1.0	1.4
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	<0.00089	<0.00089	<0.00089
F1 (C6-C10)	mg/L	2.2	<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
Organics							
COD	mg/L	-	55	42	44	57	47
TOC	mg/L	-	-	-	-	-	
DOC	mg/L	-	13	14	13	10	13
Oil & Grease	mg/L	-	-	-	-	-	
Metals							
Aluminum	mg/L	0.0007 / 0.05 [5]	0.015	0.0093	0.0071	0.047	0.0043
Antimony	mg/L	0.006	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic	mg/L	0.005	0.0012	0.00075	0.001	0.00069	0.00095
Barium	mg/L	1	0.031	0.034	0.033	0.046	0.044
Beryllium	mg/L	-	<0.0010	<0.0010	<0.0010	<0.0010	
Boron	mg/L	1	0.82	0.79	0.84	0.87	0.81
Cadmium	mg/L	0.00004-0.00037 [2]	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
Chromium	mg/L	0.05	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Cobalt	mg/L	-	0.00056	0.00043	0.00033	0.00040	
Copper	mg/L	0.007	0.0026	<0.00020	0.00041	0.00099	<0.00020
Lead	mg/L	0.001-0.007 [2]	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Lithium	mg/L	-	0.064	0.067	0.069	0.073	
Manganese	mg/L	0.05	0.022	0.032	0.039	0.033	0.23
Mercury	mg/L	0.000005	0.000017	<0.0000020	0.0000026	<0.0000020	<0.0000019
Molybdenum	mg/L	-	0.010	0.0088	0.011	0.0081	
Nickel	mg/L	0.007-0.170 [2]	0.0019	0.00085	0.0012	0.00067	0.0022
Phosphorus	mg/L	-	0.13	0.11	0.18	0.15	
Selenium	mg/L	0.002	0.00023	<0.00020	<0.00020	<0.00020	<0.00020
Silicon	mg/L	-	3.4	3.5	3.6	3.5	
Silver	mg/L	0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Strontium	mg/L	-	0.045	0.046	0.047	0.049	
Sulphur	mg/L	-	1.0	0.72	0.95	0.45	
Thallium	mg/L	-	<0.00020	<0.00020	<0.00020	<0.00020	
Tin	mg/L	-	<0.0010	<0.0010	<0.0010	<0.0010	
Titanium	mg/L	-	<0.0010	<0.0010	<0.0010	0.0033	
Uranium	mg/L	0.01	0.00037	0.00026	0.00058	0.00018	0.0011
Vanadium	mg/L	-	0.0028	0.0021	<0.0010	0.0032	
Zinc	mg/L	0.03	0.0033	<0.0030	<0.0030	<0.0030	<0.0030

Notes:

[1] Alberta Environment and Parks (AEP). 2019. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. 198 pp. Referenced guidelines are for fine textured soils under Agricultural land use

[2] Guideline varies with hardness
[3] Guideline varies with chloride
[4] Guideline varies with pH and temperature
[5] Guideline varies with pH
"-" No applicable guideline or not analyzed
Exceeds Regulatory Limit
Italic - Detection limit greater than Tier 1 Guideline

Table E36A: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW-36A				
			Jun-16	Jun-17	Jun-18	Jun-19	Jun-20
Volatile Organic Compounds (VOCs)							
Bromodichloromethane	mg/L	-	-	-	-	<0.00050	
Bromoform	mg/L	-	-	-	-	<0.00050	
Bromomethane	mg/L	-	-	-	-	<0.0020	
Carbon tetrachloride	mg/L	0.002	-	-	-	<0.00050	<0.00050
Chlorobenzene	mg/L	0.0013	-	-	-	<0.00050	<0.00050
Chloroethane	mg/L	-	-	-	-	<0.0010	
Chloroform	mg/L	0.08	-	-	-	<0.00050	<0.00050
Chloromethane	mg/L	-	-	-	-	<0.0020	
Dibromochloromethane	mg/L	0.1	-	-	-	<0.0010	<0.0010
1,2-Dibromoethane	mg/L	-	-	-	-	<0.00020	
1,2-Dichlorobenzene	mg/L	0.0007	-	-	-	<0.00050	<0.00050
1,3-Dichlorobenzene	mg/L	-	-	-	-	<0.00050	
1,4-Dichlorobenzene	mg/L	0.001	-	-	-	<0.00050	<0.00050
1,1-Dichloroethane	mg/L	-	-	-	-	<0.00050	
1,2-Dichloroethane	mg/L	0.005	-	-	-	<0.00050	<0.00050
1,1-Dichloroethene	mg/L	0.014	-	-	-	<0.00050	<0.00050
1,2-Dichloroethene (cis)	mg/L	-	-	-	-	<0.00050	
1,2-Dichloroethene (trans)	mg/L	-	-	-	-	<0.00050	
1,2-Dichloropropane	mg/L	-	-	-	-	<0.00050	
1,3-Dichloropropene [cis]	mg/L	-	-	-	-	<0.00050	
1,3-Dichloropropene [trans]	mg/L	-	-	-	-	<0.00050	
Methyl t-Butyl Ether (MTBE)	mg/L	0.015	-	-	-	<0.00050	<0.00050
Methylene Chloride	mg/L	0.05	-	-	-	<0.0020	<0.0020
Methyl Methacrylate	mg/L	0.47	-	-	-	<0.00050	<0.00050
Styrene	mg/L	-	-	-	-	<0.00050	
1,1,1,2-Tetrachloroethane	mg/L	-	-	-	-	<0.0010	
1,1,2,2-Tetrachloroethane	mg/L	-	-	-	-	<0.0020	
Tetrachloroethene	mg/L	0.01	-	-	-	<0.00050	<0.00050
1,2,3-Trichlorobenzene	mg/L	0.008	-	-	-	<0.0010	<0.0010
1,2,4-Trichlorobenzene	mg/L	0.015	-	-	-	<0.0010	<0.0010
1,3,5-Trichlorobenzene	mg/L	0.014	-	-	-	<0.00050	<0.00050
1,1,1-Trichloroethane	mg/L	-	-	-	-	<0.00050	
1,1,2-Trichloroethane	mg/L	-	-	-	-	<0.00050	
Trichloroethene	mg/L	0.005	-	-	-	<0.00050	<0.00050
Trichlorofluoromethane	mg/L	-	-	-	-	<0.00050	
Trihalomethanes	mg/L	-	-	-	-	<0.0013	<0.0013
1,2,4-Trimethylbenzene	mg/L	-	-	-	-	<0.00050	
1,3,5-Trimethylbenzene	mg/L	-	-	-	-	<0.00050	
Vinyl chloride	mg/L	0.002	-	-	-	<0.00050	<0.00050

Notes:

[1] Alberta Environment and Parks (AEP). 2019. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. 198 pp. Referenced guidelines are for fine textured soils under Agricultural land use

[2] Guideline varies with hardness
[3] Guideline varies with chloride
[4] Guideline varies with pH and temperature
[5] Guideline varies with pH
"-" No applicable guideline or not analyzed
Exceeds Regulatory Limit
Italic - Detection limit greater than Tier 1 Guideline

Table E37A: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	19MW37A Nov-19	19MW37A Jun-20
Field Measurements				
Field pH	-	-	8.10	8.14
Field EC	mS	-	3.24	3.9
Field Temperature	°C	-	1.0	6.5
Routine Water				
pH	-	6.5 - 8.5	8.06	8.38
Conductivity (EC)	µS/cm	1000	3000	3800
Calcium	mg/L	-	32	26
Magnesium	mg/L	-	12	9.1
Sodium	mg/L	200	770	960
Potassium	mg/L	-	5.5	4.9
Iron	mg/L	0.3	3.8	<0.060
Sulphate	mg/L	128-429 [2]	730	1200
Chloride	mg/L	100	8.0	6.3
Bicarbonate	mg/L	-	1100	850
Carbonate	mg/L	-	<1.0	8.2
Hydroxide	mg/L	-	<1.0	<1.0
Nitrate (N)	mg/L	3	0.029	<0.010
Nitrite (N)	mg/L	0.02 - 0.20 [3]	<0.010	<0.010
Nitrate and Nitrate (N)	mg/L	-	0.029	<0.014
Total Dissolved Solids (TDS)	mg/L	500	2100	2600
Hardness	mg/L	-	130	100
Alkalinity (total as CaCO3)	mg/L	-	870	710
Alkalinity (pp as CaCO3)	mg/L	-	<1.0	
Ionic Balance	N/A	-	5.5	5.4
Water Nutrients				
Ammonia-N	mg/L	0.018-190 [4]	0.69	1.3
TKN	mg/L	-	1.3	1.5
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	<0.00089	<0.00089
F1 (C6-C10)	mg/L	2.2	<0.10	<0.10
F2 (>C10-C16)	mg/L	1.1	<0.10	<0.10
Organics				
COD	mg/L	-	62	41
TOC	mg/L	-	-	
DOC	mg/L	-	10	11
Oil & Grease	mg/L	-	-	
Metals				
Aluminum	mg/L	0.0007 / 0.05 [5]	0.90	0.01
Antimony	mg/L	0.006	<0.00060	<0.00060
Arsenic	mg/L	0.005	0.0019	0.0006
Barium	mg/L	1	0.018	<0.010
Beryllium	mg/L	-	<0.0010	
Boron	mg/L	1	0.60	0.69
Cadmium	mg/L	0.00004-0.00037 [2]	0.000051	<0.000020
Chromium	mg/L	0.05	0.0011	<0.0010
Cobalt	mg/L	-	0.0027	
Copper	mg/L	0.007	0.0029	0.0005
Lead	mg/L	0.001-0.007 [2]	0.0042	<0.00020
Lithium	mg/L	-	0.19	
Manganese	mg/L	0.05	0.43	0.28
Mercury	mg/L	0.000005	<0.0000020	<0.0000019
Molybdenum	mg/L	-	0.00061	0.0013
Nickel	mg/L	0.007-0.170 [2]	0.0061	0.0017
Phosphorus	mg/L	-	0.16	
Selenium	mg/L	0.002	<0.00020	<0.0002
Silicon	mg/L	-	6.1	
Silver	mg/L	0.0001	<0.00010	<0.0001
Strontium	mg/L	-	0.55	
Sulphur	mg/L	-	370	
Thallium	mg/L	-	<0.00020	
Tin	mg/L	-	0.0010	
Titanium	mg/L	-	0.010	
Uranium	mg/L	0.01	0.0033	0.0055
Vanadium	mg/L	-	0.0041	
Zinc	mg/L	0.03	0.014	0.0033

Notes:

[1] Alberta Environment and Parks (AEP). 2019. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. 198 pp. Referenced guidelines are for fine textured soils under Agricultural land use

[2] Guideline varies with hardness

[3] Guideline varies with chloride

[4] Guideline varies with pH and temperature

[5] Guideline varies with pH

"-" No applicable guideline or not analyzed

Total Dissolved Solids, not a measured value (TDS)

Exceeds Regulatory Limit

Italic - Detection limit greater than Tier 1 Guideline

Table E37A: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	19MW37A	19MW37A
			Nov-19	Jun-20
Volatile Organic Compounds (VOCs)				
Bromodichloromethane	mg/L	-	-	-
Bromoform	mg/L	-	-	-
Bromomethane	mg/L	-	-	-
Carbon tetrachloride	mg/L	0.002	-	<0.00050
Chlorobenzene	mg/L	0.0013	-	<0.00050
Chloroethane	mg/L	-	-	-
Chloroform	mg/L	0.08	-	<0.00050
Chloromethane	mg/L	-	-	-
Dibromochloromethane	mg/L	0.1	-	<0.0010
1,2-Dibromoethane	mg/L	-	-	-
1,2-Dichlorobenzene	mg/L	0.0007	-	<0.00050
1,3-Dichlorobenzene	mg/L	-	-	-
1,4-Dichlorobenzene	mg/L	0.001	-	<0.00050
1,1-Dichloroethane	mg/L	-	-	-
1,2-Dichloroethane	mg/L	0.005	<0.00050	<0.00050
1,1-Dichloroethene	mg/L	0.014	-	<0.00050
1,2-Dichloroethene (cis)	mg/L	-	-	<0.00050
1,2-Dichloroethene (trans)	mg/L	-	-	-
1,2-Dichloropropane	mg/L	-	-	-
1,3-Dichloropropene [cis]	mg/L	-	-	-
1,3-Dichloropropene [trans]	mg/L	-	-	-
Methyl t-Butyl Ether (MTBE)	mg/L	0.015	-	<0.00050
Methylene Chloride	mg/L	0.05	-	<0.0020
Methyl Methacrylate	mg/L	0.47	-	<0.00050
Styrene	mg/L	-	-	-
1,1,1,2-Tetrachloroethane	mg/L	-	-	-
1,1,2,2-Tetrachloroethane	mg/L	-	-	-
Tetrachloroethene	mg/L	0.01	<0.00050	<0.00050
1,2,3-Trichlorobenzene	mg/L	0.008	-	<0.0010
1,2,4-Trichlorobenzene	mg/L	0.015	-	<0.0010
1,3,5-Trichlorobenzene	mg/L	0.014	-	<0.00050
1,1,1-Trichloroethane	mg/L	-	-	-
1,1,2-Trichloroethane	mg/L	-	-	-
Trichloroethene	mg/L	0.005	<0.00050	<0.00050
Trichlorofluoromethane	mg/L	-	-	-
Trihalomethanes	mg/L	-	-	<0.0013
1,2,4-Trimethylbenzene	mg/L	-	-	-
1,3,5-Trimethylbenzene	mg/L	-	-	-
Vinyl chloride	mg/L	0.002	<0.00050	<0.00050

Notes:

[1] Alberta Environment and Parks (AEP). 2019. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. 198 pp. Referenced guidelines are for fine textured soils under Agricultural land use

[2] Guideline varies with hardness

[3] Guideline varies with chloride

[4] Guideline varies with pH and temperature

[5] Guideline varies with pH

"-" No applicable guideline or not analyzed

Total Dissolved Solids, not a measured value (TDS)

Exceeds Regulatory Limit

Italic - Detection limit greater than Tier 1 Guideline

Table E37B: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	19MW37B Nov-19	19MW37B Jun-20
Field Measurements				
Field pH	-	-	7.58	7.25
Field EC	mS	-	2.05	1.92
Field Temperature	°C	-	2.2	8.2
Routine Water				
pH	-	6.5 - 8.5	7.74	7.94
Conductivity (EC)	µS/cm	1000	1900	1900
Calcium	mg/L	-	79	73
Magnesium	mg/L	-	36	30
Sodium	mg/L	200	320	370
Potassium	mg/L	-	11	9.3
Iron	mg/L	0.3	0.096	<0.060
Sulphate	mg/L	128-429 [2]	220	230
Chloride	mg/L	100	3.6	3.3
Bicarbonate	mg/L	-	1000	1000
Carbonate	mg/L	-	<1.0	<1.0
Hydroxide	mg/L	-	<1.0	<1.0
Nitrate (N)	mg/L	3	<0.010	0.011
Nitrite (N)	mg/L	0.02 - 0.20 [3]	<0.010	<0.010
Nitrate and Nitrate (N)	mg/L	-	<0.014	<0.014
Total Dissolved Solids (TDS)	mg/L	500	1200	1200
Hardness	mg/L	-	350	310
Alkalinity (total as CaCO3)	mg/L	-	850	820
Alkalinity (pp as CaCO3)	mg/L	-	<1.0	
Ionic Balance	N/A	-	1.6	2.9
Water Nutrients				
Ammonia-N	mg/L	0.018-190 [4]	0.64	0.69
TKN	mg/L	-	3.5	0.99
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	<0.00089	<0.00089
F1 (C6-C10)	mg/L	2.2	<0.10	<0.10
F2 (>C10-C16)	mg/L	1.1	<0.10	<0.10
Organics				
COD	mg/L	-	189	19
TOC	mg/L	-	-	
DOC	mg/L	-	7.5	8.4
Oil & Grease	mg/L	-	-	
Metals				
Aluminum	mg/L	0.0007 / 0.05 [5]	<0.0030	<0.0030
Antimony	mg/L	0.006	<0.00060	<0.00060
Arsenic	mg/L	0.005	0.001	0.00051
Barium	mg/L	1	0.027	0.023
Beryllium	mg/L	-	<0.0010	
Boron	mg/L	1	0.11	0.12
Cadmium	mg/L	0.00004-0.00037 [2]	<0.000020	<0.000020
Chromium	mg/L	0.05	<0.0010	<0.0010
Cobalt	mg/L	-	0.0012	
Copper	mg/L	0.007	0.00021	0.0033
Lead	mg/L	0.001-0.007 [2]	0.00026	<0.00020
Lithium	mg/L	-	0.13	
Manganese	mg/L	0.05	0.27	0.26
Mercury	mg/L	0.000005	<0.0000020	<0.0000019
Molybdenum	mg/L	-	0.00054	
Nickel	mg/L	0.007-0.170 [2]	0.0017	0.0012
Phosphorus	mg/L	-	<0.10	
Selenium	mg/L	0.002	<0.00020	<0.00020
Silicon	mg/L	-	6	
Silver	mg/L	0.0001	<0.00010	<0.00010
Strontium	mg/L	-	0.84	
Sulphur	mg/L	-	73	
Thallium	mg/L	-	<0.00020	
Tin	mg/L	-	<0.0010	
Titanium	mg/L	-	<0.0010	
Uranium	mg/L	0.01	0.0012	0.0019
Vanadium	mg/L	-	<0.0010	
Zinc	mg/L	0.03	<0.0030	<0.0030

Notes:

[1] Alberta Environment and Parks (AEP). 2019. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. 198 pp. Referenced guidelines are for fine textured soils under Agricultural land use

[2] Guideline varies with hardness

[3] Guideline varies with chloride

[4] Guideline varies with pH and temperature

[5] Guideline varies with pH

"-" No applicable guideline or not analyzed

Exceeds Regulatory Limit

Italic - Detection limit greater than Tier 1 Guideline

Table E37B: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	19MW37B	19MW37B
			Nov-19	Jun-20
Volatile Organic Compounds (VOCs)				
Bromodichloromethane	mg/L	-	-	
Bromoform	mg/L	-	-	
Bromomethane	mg/L	-	-	
Carbon tetrachloride	mg/L	0.002	-	<0.00050
Chlorobenzene	mg/L	0.0013	-	<0.00050
Chloroethane	mg/L	-	-	
Chloroform	mg/L	0.08	-	<0.00050
Chloromethane	mg/L	-	-	
Dibromochloromethane	mg/L	0.1	-	<0.0010
1,2-Dibromoethane	mg/L	-	-	
1,2-Dichlorobenzene	mg/L	0.0007	-	<0.00050
1,3-Dichlorobenzene	mg/L	-	-	
1,4-Dichlorobenzene	mg/L	0.001	-	<0.00050
1,1-Dichloroethane	mg/L	-	-	
1,2-Dichloroethane	mg/L	0.005	<0.00050	<0.00050
1,1-Dichloroethene	mg/L	0.014	-	<0.00050
1,2-Dichloroethene (cis)	mg/L	-	-	
1,2-Dichloroethene (trans)	mg/L	-	-	
1,2-Dichloropropane	mg/L	-	-	
1,3-Dichloropropene [cis]	mg/L	-	-	
1,3-Dichloropropene [trans]	mg/L	-	-	
Methyl t-Butyl Ether (MTBE)	mg/L	0.015	-	<0.00050
Methylene Chloride	mg/L	0.05	-	<0.0020
Methyl Methacrylate	mg/L	0.47	-	<0.00050
Styrene	mg/L	-	-	
1,1,1,2-Tetrachloroethane	mg/L	-	-	
1,1,2,2-Tetrachloroethane	mg/L	-	-	
Tetrachloroethene	mg/L	0.01	<0.00050	<0.00050
1,2,3-Trichlorobenzene	mg/L	0.008	-	<0.0010
1,2,4-Trichlorobenzene	mg/L	0.015	-	<0.0010
1,3,5-Trichlorobenzene	mg/L	0.014	-	<0.00050
1,1,1-Trichloroethane	mg/L	-	-	
1,1,2-Trichloroethane	mg/L	-	-	
Trichloroethene	mg/L	0.005	<0.00050	<0.00050
Trichlorofluoromethane	mg/L	-	-	
Trihalomethanes	mg/L	-	-	<0.0013
1,2,4-Trimethylbenzene	mg/L	-	-	
1,3,5-Trimethylbenzene	mg/L	-	-	
Vinyl chloride	mg/L	0.002	<0.00050	<0.00050

Notes:

[1] Alberta Environment and Parks (AEP). 2019. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. 198 pp. Referenced guidelines are for fine textured soils under Agricultural land use

[2] Guideline varies with hardness

[3] Guideline varies with chloride

[4] Guideline varies with pH and temperature

[5] Guideline varies with pH

"-" No applicable guideline or not analyzed

Exceeds Regulatory Limit

Italic - Detection limit greater than Tier 1 Guideline

Table E38A: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	19MW38A Nov-19	19MW38A Jun-20
Field Measurements				
Field pH	-	-	7.99	8.34
Field EC	mS	-	4.45	2680
Field Temperature	°C	-	2.0	5.1
Routine Water				
pH	-	6.5 - 8.5	8.42	8.77
Conductivity (EC)	µS/cm	1000	4000	2170
Calcium	mg/L	-	31	12
Magnesium	mg/L	-	13	3
Sodium	mg/L	200	1000	420
Potassium	mg/L	-	9.9	3.6
Iron	mg/L	0.3	0.15	<0.060
Sulphate	mg/L	128-429 [2]	980	420
Chloride	mg/L	100	8.8	13.0
Bicarbonate	mg/L	-	1400	1100
Carbonate	mg/L	-	25	21
Hydroxide	mg/L	-	<1.0	<1.0
Nitrate (N)	mg/L	3	<0.010	<0.010
Nitrite (N)	mg/L	0.02 - 0.20 [3]	<0.010	0.012
Nitrate and Nitrate (N)	mg/L	-	<0.014	<0.014
Total Dissolved Solids (TDS)	mg/L	500	2800	1700
Hardness	mg/L	-	130	42
Alkalinity (total as CaCO3)	mg/L	-	1200	930
Alkalinity (pp as CaCO3)	mg/L	-	20	-
Ionic Balance	N/A	-	2.8	6.4
Water Nutrients				
Ammonia-N	mg/L	0.018-190 [4]	1.8	0.95
TKN	mg/L	-	46	1.7
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	<0.00089	<0.00089
F1 (C6-C10)	mg/L	2.2	<0.10	<0.10
F2 (>C10-C16)	mg/L	1.1	<0.10	<0.10
Organics				
COD	mg/L	-	3540	45
TOC	mg/L	-	-	-
DOC	mg/L	-	16	16
Oil & Grease	mg/L	-	-	-
Metals				
Aluminum	mg/L	0.0007 / 0.05 [5]	0.11	0.02
Antimony	mg/L	0.006	0.00075	<0.00060
Arsenic	mg/L	0.005	0.0049	0.0049
Barium	mg/L	1	0.022	0.017
Beryllium	mg/L	-	<0.0010	-
Boron	mg/L	1	0.52	0.76
Cadmium	mg/L	0.00004-0.00037 [2]	<0.000020	<0.000020
Chromium	mg/L	0.05	<0.0010	<0.0010
Cobalt	mg/L	-	0.00074	-
Copper	mg/L	0.007	0.00058	0.0016
Lead	mg/L	0.001-0.007 [2]	<0.00020	-
Lithium	mg/L	-	0.17	-
Manganese	mg/L	0.05	0.12	0.032
Mercury	mg/L	0.000005	<0.0000020	<0.0000019
Molybdenum	mg/L	-	0.015	0.0097
Nickel	mg/L	0.007-0.170 [2]	0.0055	0.005
Phosphorus	mg/L	-	<0.10	-
Selenium	mg/L	0.002	0.00052	0.0004
Silicon	mg/L	-	4.4	-
Silver	mg/L	0.0001	<0.00010	<0.00010
Strontium	mg/L	-	0.52	-
Sulphur	mg/L	-	300	-
Thallium	mg/L	-	<0.00020	-
Tin	mg/L	-	<0.0010	-
Titanium	mg/L	-	0.006	-
Uranium	mg/L	0.01	0.0094	0.0035
Vanadium	mg/L	-	0.0033	-
Zinc	mg/L	0.03	<0.0030	<0.0030

Notes:

[1] Alberta Environment and Parks (AEP). 2019. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. 198 pp. Referenced guidelines are for fine textured soils under Agricultural land use

[2] Guideline varies with hardness
[3] Guideline varies with chloride
[4] Guideline varies with pH and temperature
[5] Guideline varies with pH
"-" No applicable guideline or not analyzed
Exceeds Regulatory Limit
Italic - Detection limit greater than Tier 1 Guideline

Table E38A: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	19MW38A	19MW38A
			Nov-19	Jun-20
Volatile Organic Compounds (VOCs)				
Bromodichloromethane	mg/L	-	-	-
Bromoform	mg/L	-	-	-
Bromomethane	mg/L	-	-	-
Carbon tetrachloride	mg/L	0.002	-	<0.00050
Chlorobenzene	mg/L	0.0013	-	<0.00050
Chloroethane	mg/L	-	-	-
Chloroform	mg/L	0.08	-	<0.00050
Chloromethane	mg/L	-	-	<0.0010
Dibromochloromethane	mg/L	0.1	-	<0.00050
1,2-Dibromoethane	mg/L	-	-	-
1,2-Dichlorobenzene	mg/L	0.0007	-	<0.00050
1,3-Dichlorobenzene	mg/L	-	-	-
1,4-Dichlorobenzene	mg/L	0.001	-	<0.00050
1,1-Dichloroethane	mg/L	-	-	-
1,2-Dichloroethane	mg/L	0.005	<0.00050	<0.00050
1,1-Dichloroethene	mg/L	0.014	-	<0.00050
1,2-Dichloroethene (cis)	mg/L	-	-	-
1,2-Dichloroethene (trans)	mg/L	-	-	-
1,2-Dichloropropane	mg/L	-	-	-
1,3-Dichloropropene [cis]	mg/L	-	-	-
1,3-Dichloropropene [trans]	mg/L	-	-	-
Methyl t-Butyl Ether (MTBE)	mg/L	0.015	-	<0.00050
Methylene Chloride	mg/L	0.05	-	<0.0020
Methyl Methacrylate	mg/L	0.47	-	<0.00050
Styrene	mg/L	-	-	-
1,1,1,2-Tetrachloroethane	mg/L	-	-	-
1,1,2,2-Tetrachloroethane	mg/L	-	-	-
Tetrachloroethene	mg/L	0.01	<0.00050	<0.00050
1,2,3-Trichlorobenzene	mg/L	0.008	-	<0.0010
1,2,4-Trichlorobenzene	mg/L	0.015	-	<0.0010
1,3,5-Trichlorobenzene	mg/L	0.014	-	<0.00050
1,1,1-Trichloroethane	mg/L	-	-	-
1,1,2-Trichloroethane	mg/L	-	-	-
Trichloroethene	mg/L	0.005	<0.00050	<0.00050
Trichlorofluoromethane	mg/L	-	-	-
Trihalomethanes	mg/L	-	-	<0.0013
1,2,4-Trimethylbenzene	mg/L	-	-	-
1,3,5-Trimethylbenzene	mg/L	-	-	-
Vinyl chloride	mg/L	0.002	<0.00050	<0.00050

Notes:

[1] Alberta Environment and Parks (AEP). 2019. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. 198 pp. Referenced guidelines are for fine textured soils under Agricultural land use

[2] Guideline varies with hardness
[3] Guideline varies with chloride
[4] Guideline varies with pH and temperature
[5] Guideline varies with pH
"-" No applicable guideline or not analyzed
Exceeds Regulatory Limit
Italic - Detection limit greater than Tier 1 Guideline

Table E38B: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	19MW38B Nov-19	19MW38B Jun-20
Field Measurements				
Field pH	-	-	7.86	7.86
Field EC	mS	-	4.43	4440
Field Temperature	°C	-	1.8	5.2
Routine Water				
pH	-	6.5 - 8.5	8.23	8.27
Conductivity (EC)	µS/cm	1000	4300	4300
Calcium	mg/L	-	32	25
Magnesium	mg/L	-	20	21
Sodium	mg/L	200	980	1100
Potassium	mg/L	-	11	9.9
Iron	mg/L	0.3	0.17	<0.060
Sulphate	mg/L	128-429 [2]	960	900
Chloride	mg/L	100	2.9	3.4
Bicarbonate	mg/L	-	1700	1600
Carbonate	mg/L	-	<1.0	<1.0
Hydroxide	mg/L	-	<1.0	<1.0
Nitrate (N)	mg/L	3	<0.010	0.032
Nitrite (N)	mg/L	0.02 - 0.20 [3]	<0.010	0.035
Nitrate and Nitrate (N)	mg/L	-	<0.014	0.067
Total Dissolved Solids (TDS)	mg/L	500	2800	2900
Hardness	mg/L	-	160	150
Alkalinity (total as CaCO3)	mg/L	-	1400	1300
Alkalinity (pp as CaCO3)	mg/L	-	<1.0	-
Ionic Balance	N/A	-	1.8	6.7
Water Nutrients				
Ammonia-N	mg/L	0.018-190 [4]	0.4	0.26
TKN	mg/L	-	6.4	0.9
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	<0.00089	<0.00089
F1 (C6-C10)	mg/L	2.2	<0.10	<0.10
F2 (>C10-C16)	mg/L	1.1	<0.10	<0.10
Organics				
COD	mg/L	-	696	31
TOC	mg/L	-	-	-
DOC	mg/L	-	16	13
Oil & Grease	mg/L	-	-	-
Metals				
Aluminum	mg/L	0.0007 / 0.05 [5]	0.04	0.02
Antimony	mg/L	0.006	<0.00060	<0.00060
Arsenic	mg/L	0.005	0.0028	0.0017
Barium	mg/L	1	0.028	0.023
Beryllium	mg/L	-	<0.0010	-
Boron	mg/L	1	0.31	0.23
Cadmium	mg/L	0.00004-0.00037 [2]	<0.000020	<0.000020
Chromium	mg/L	0.05	<0.0010	<0.0010
Cobalt	mg/L	-	0.0017	-
Copper	mg/L	0.007	0.0014	0.0016
Lead	mg/L	0.001-0.007 [2]	<0.00020	-
Lithium	mg/L	-	0.13	-
Manganese	mg/L	0.05	0.15	0.15
Mercury	mg/L	0.000005	<0.0000020	<0.0000019
Molybdenum	mg/L	-	0.0045	-
Nickel	mg/L	0.007-0.170 [2]	0.0062	0.0041
Phosphorus	mg/L	-	<0.10	-
Selenium	mg/L	0.002	0.00044	0.00021
Silicon	mg/L	-	4.9	-
Silver	mg/L	0.0001	<0.00010	<0.00010
Strontium	mg/L	-	0.38	-
Sulphur	mg/L	-	280	-
Thallium	mg/L	-	<0.00020	-
Tin	mg/L	-	<0.0010	-
Titanium	mg/L	-	0.005	-
Uranium	mg/L	0.01	0.008	0.0086
Vanadium	mg/L	-	0.0011	-
Zinc	mg/L	0.03	<0.0030	<0.0030
Volatile Organic Compounds (VOCs)				
Carbon tetrachloride	mg/L	0.002	-	<0.00050
Chlorobenzene	mg/L	0.0013	-	<0.00050
Chloroform	mg/L	0.08	-	<0.00050
Chloromethane	mg/L	-	-	<0.00050
Dibromochloromethane	mg/L	0.1	-	<0.0010
1,2-Dichlorobenzene	mg/L	0.0007	-	<0.00050
1,4-Dichlorobenzene	mg/L	0.001	-	<0.00050
1,2-Dichloroethane	mg/L	0.005	<0.00050	<0.00050
1,1-Dichloroethene	mg/L	0.014	-	<0.00050
Methyl t-Butyl Ether (MTBE)	mg/L	0.015	-	<0.00050
Methylene Chloride	mg/L	0.05	-	<0.0020
Methyl Methacrylate	mg/L	0.47	-	<0.00050
Tetrachloroethene	mg/L	0.01	<0.00050	<0.00050
1,2,3-Trichlorobenzene	mg/L	0.008	-	<0.0010
1,2,4-Trichlorobenzene	mg/L	0.015	-	<0.0010
1,3,5-Trichlorobenzene	mg/L	0.014	-	<0.00050
Trichloroethene	mg/L	0.005	<0.00050	<0.00050
Trihalomethanes	mg/L	-	-	<0.0013
Vinyl chloride	mg/L	0.002	<0.00050	<0.00050

Notes:

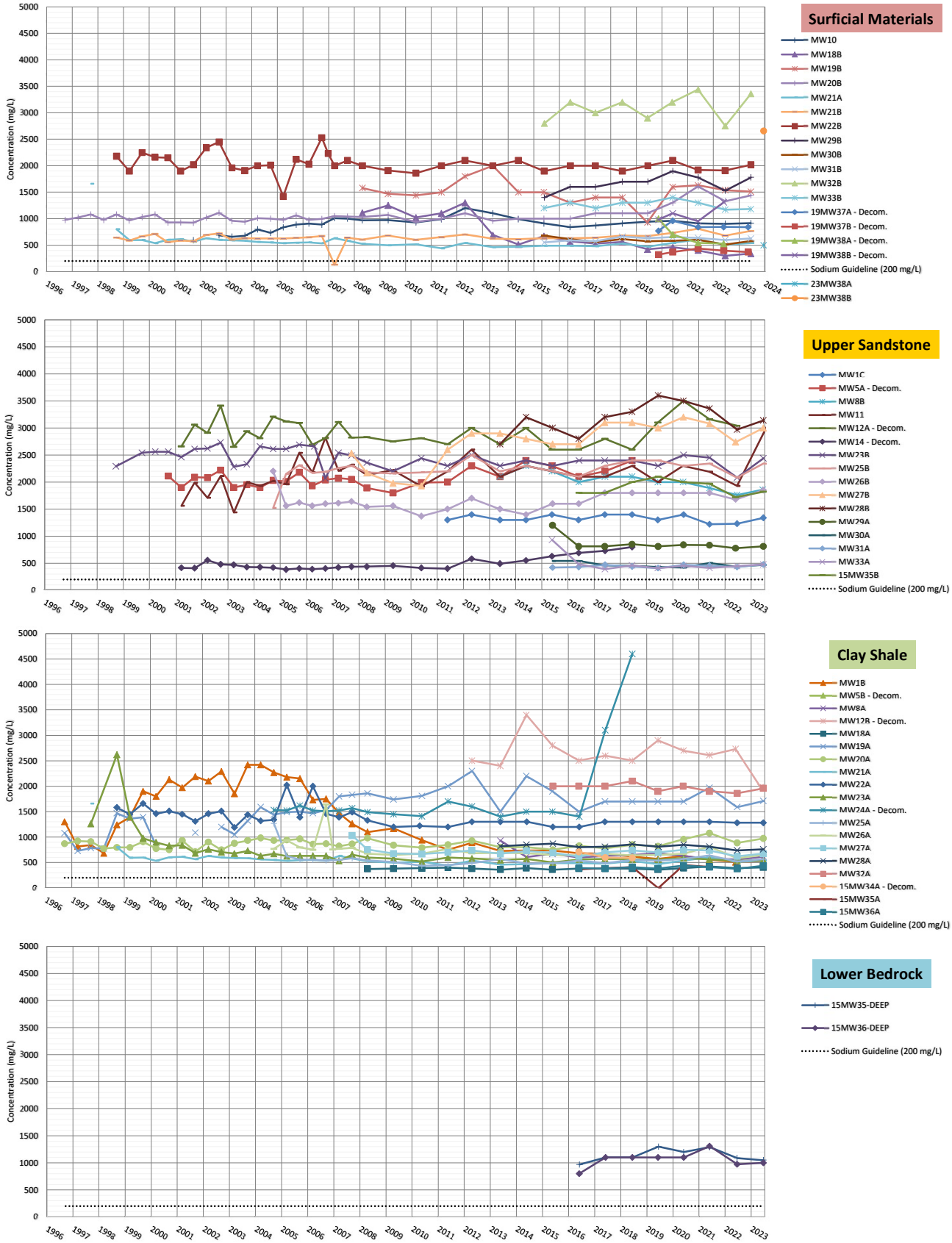
[1] Alberta Environment and Parks (AEP). 2019. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. 198 pp. Referenced guidelines are for fine textured soils under Agricultural land use

[2] Guideline varies with hardness
[3] Guideline varies with chloride
[4] Guideline varies with pH and temperature
[5] Guideline varies with pH
"-" No applicable guideline or not analyzed
Exceeds Regulatory Limit
italic - Detection limit greater than Tier 1 Guideline

APPENDIX F

CONCENTRATION TRENDS

Appendix F1 - Sodium Concentration Trends



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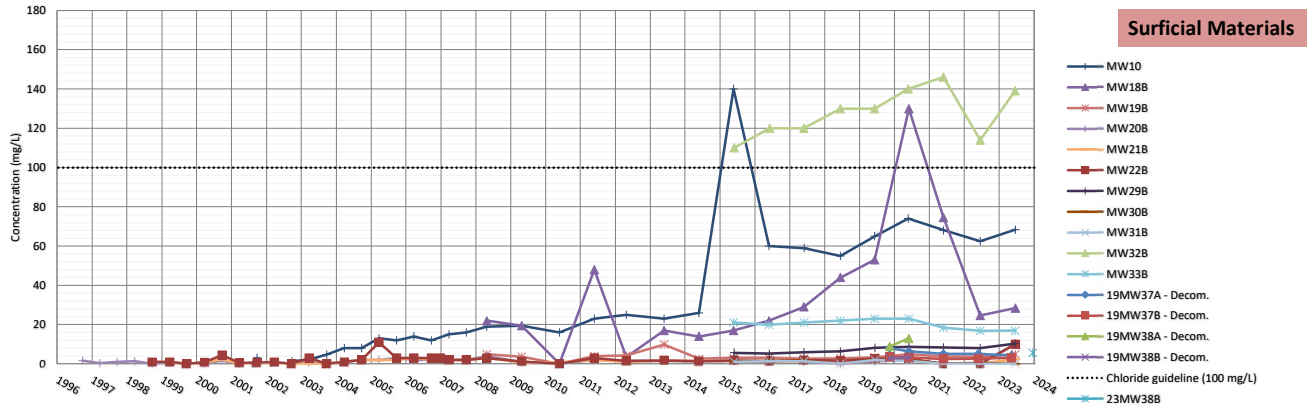
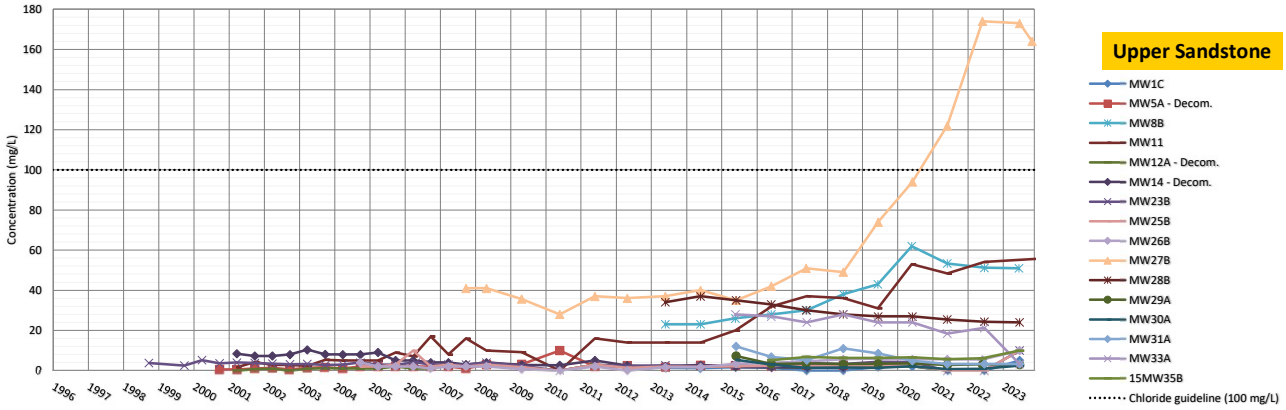
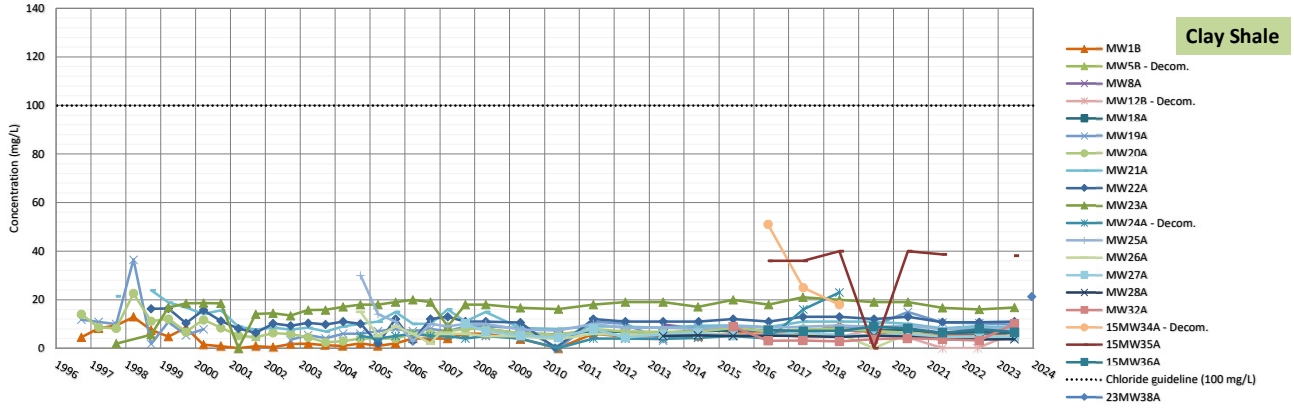
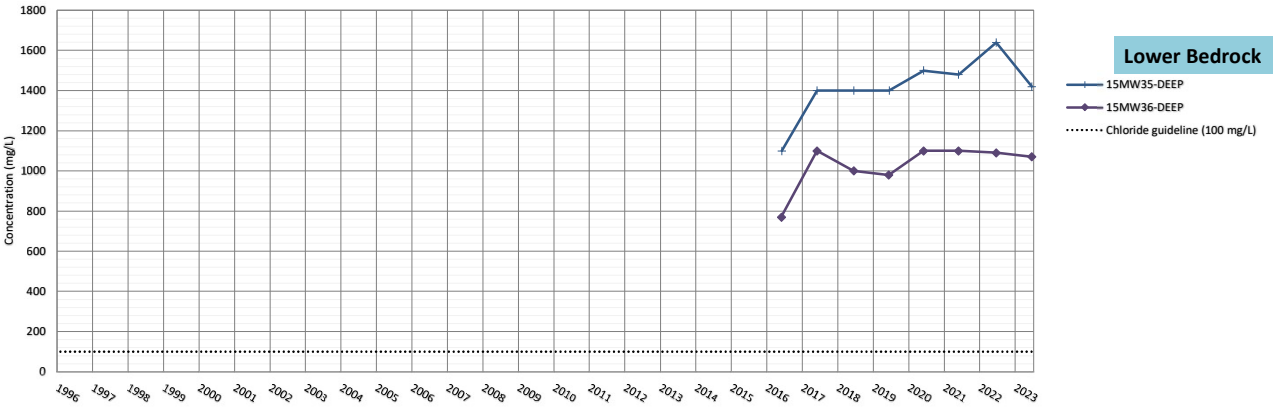
Appendix F2 - Chloride Concentration Trends

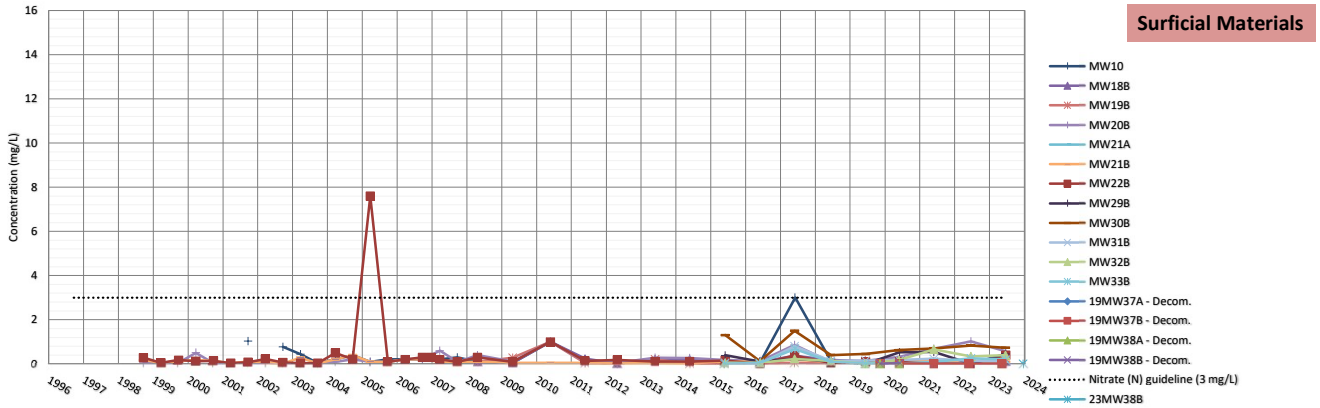


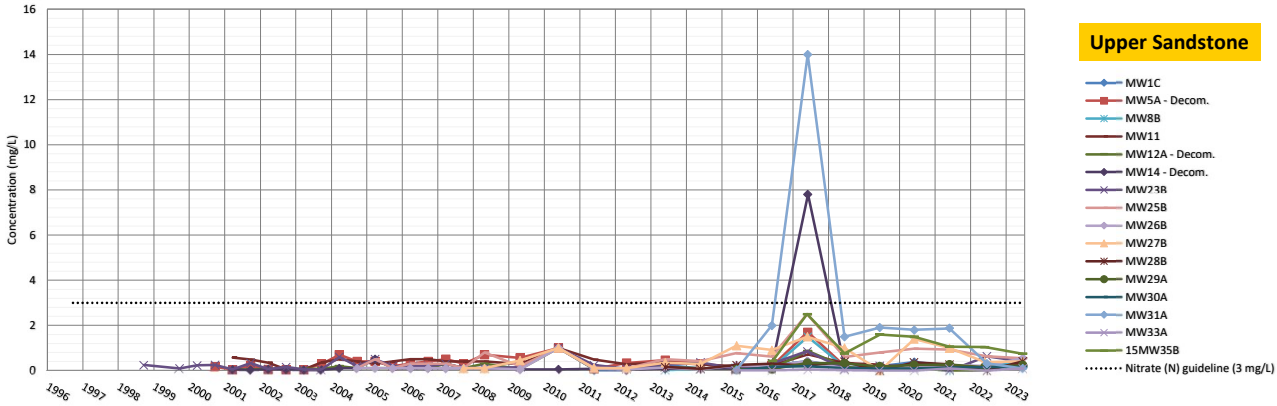


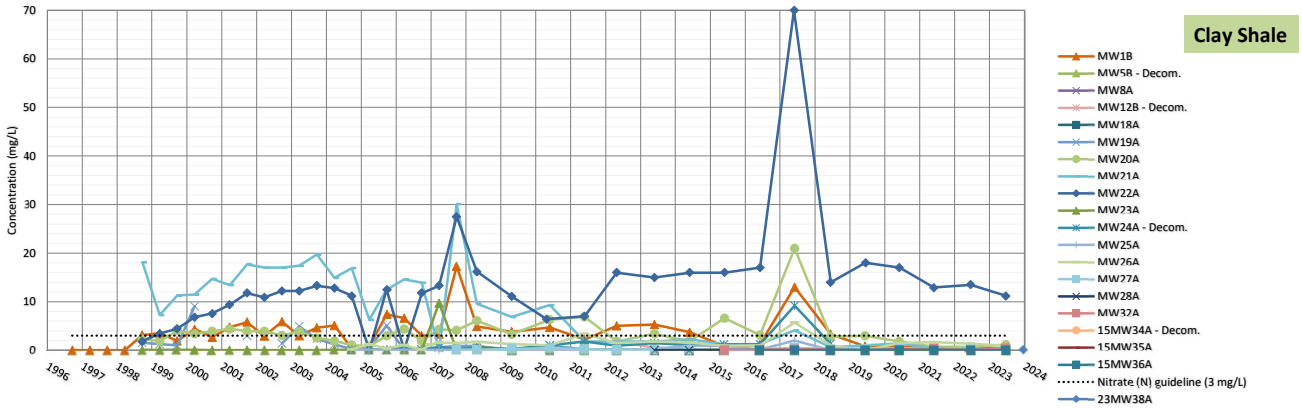


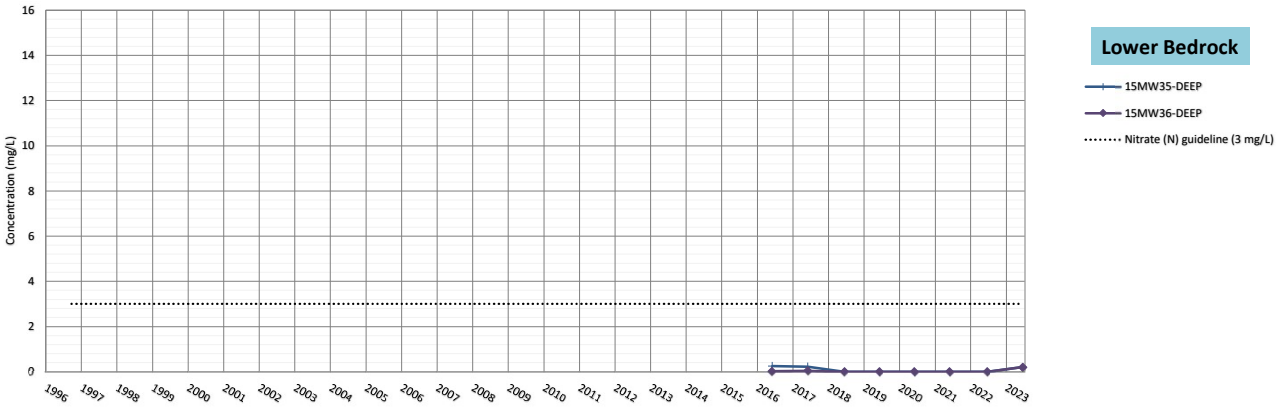


Appendix F3 - Nitrate Concentration Trends

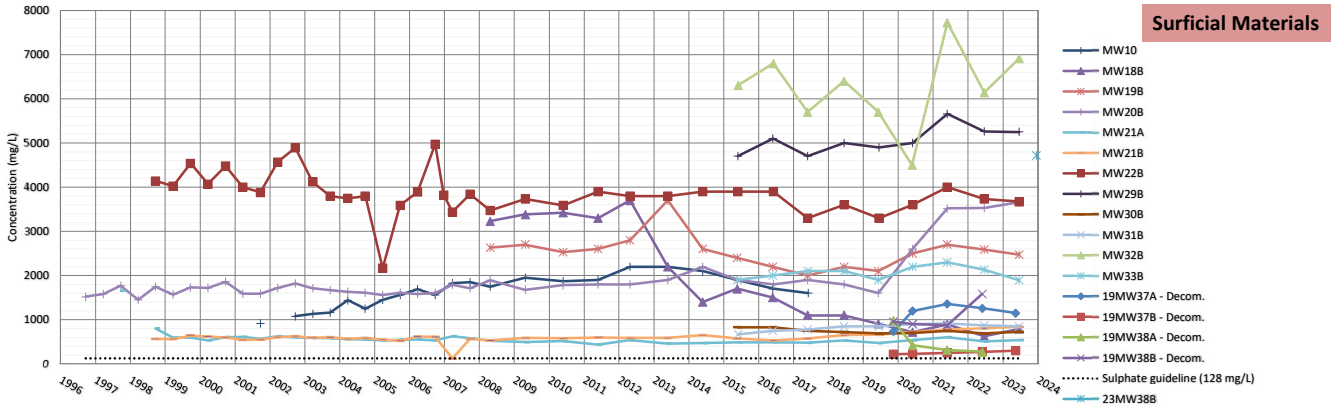


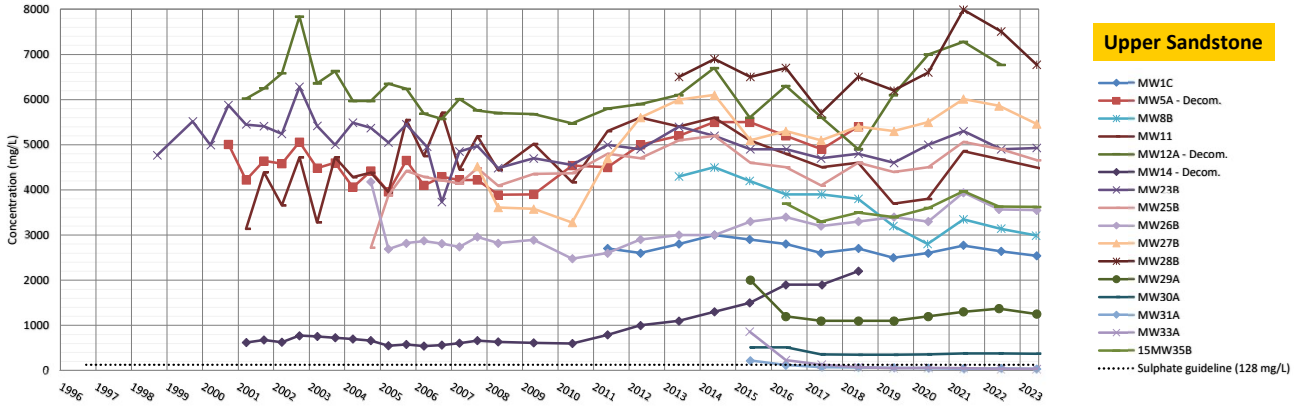


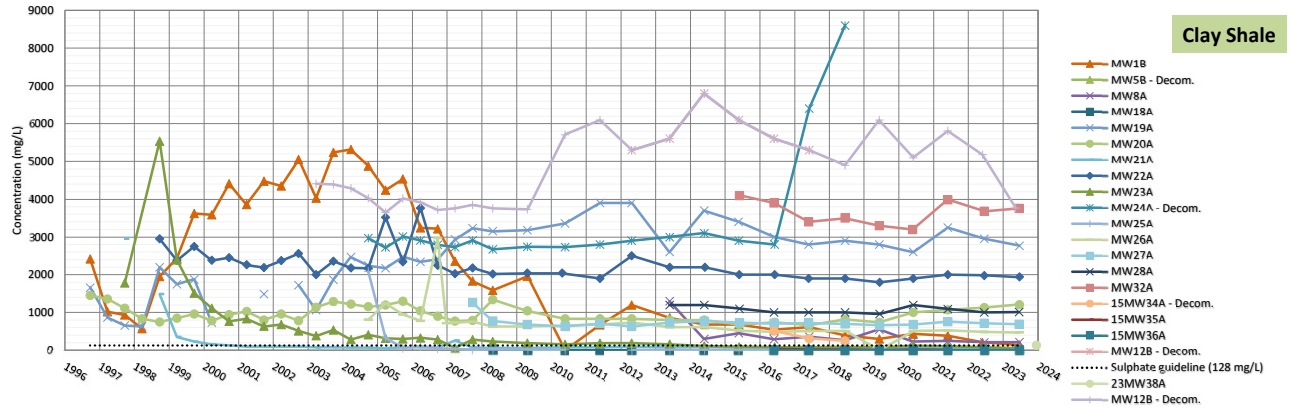


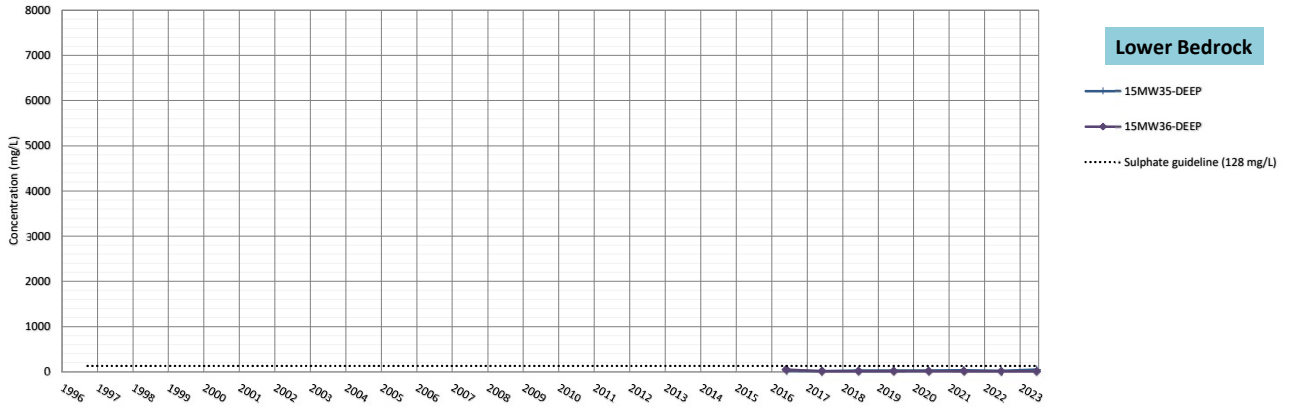


Appendix F4 - Sulphate Concentration Trends

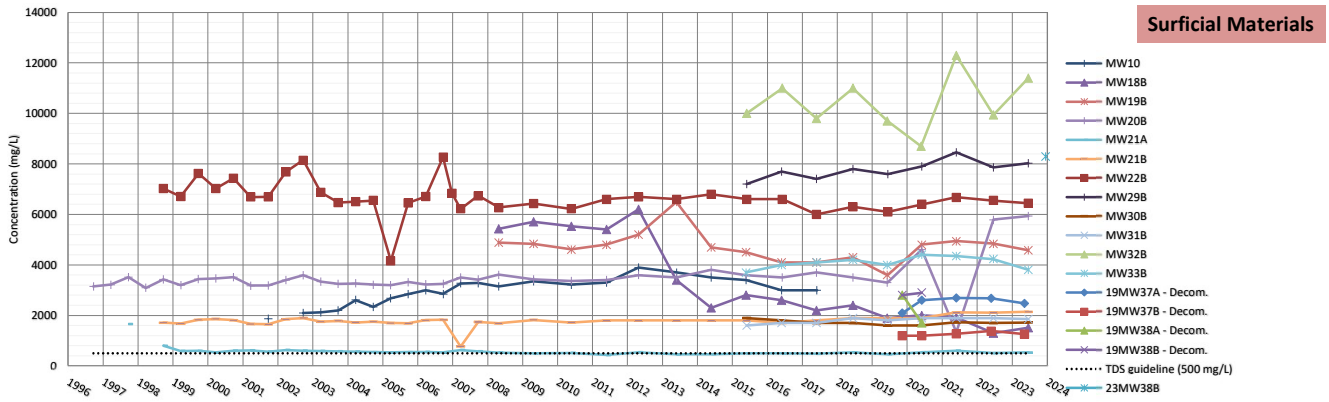


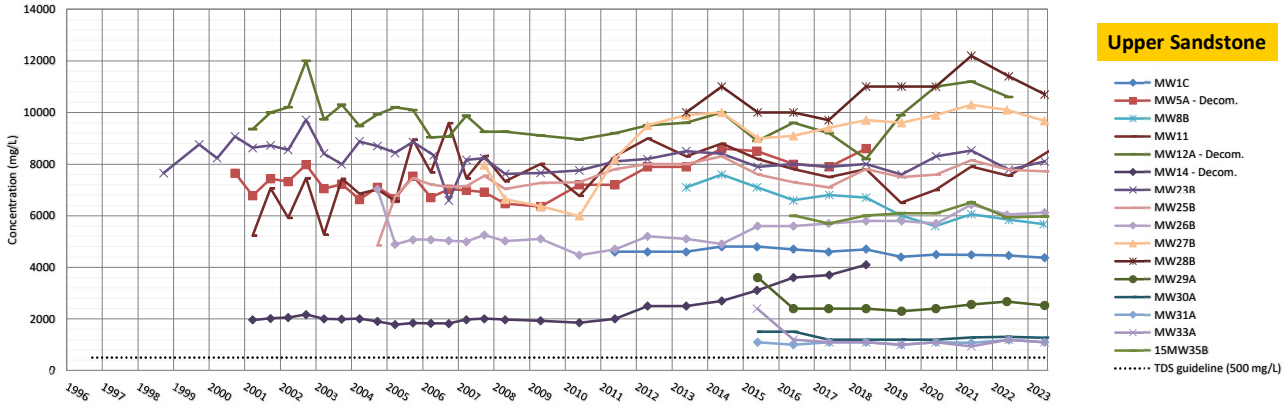


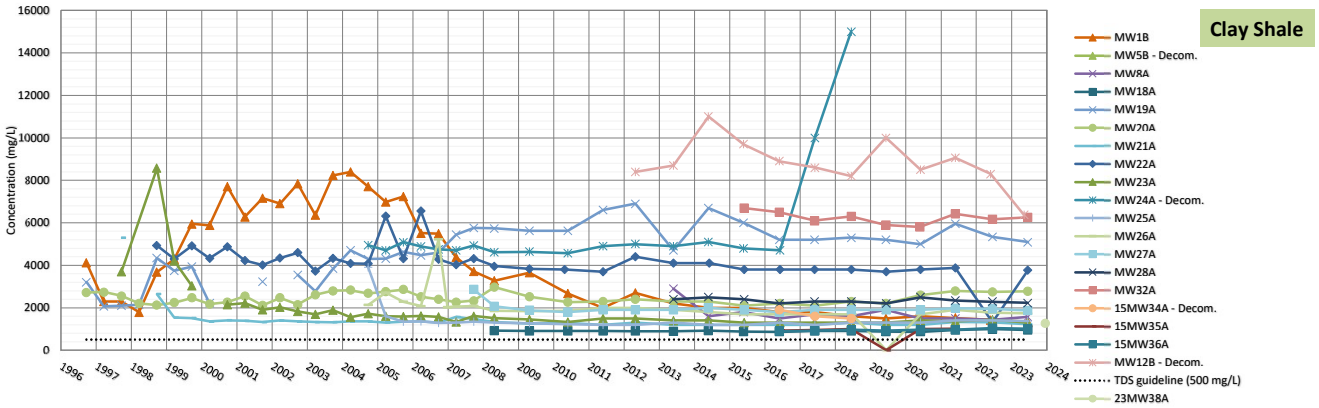


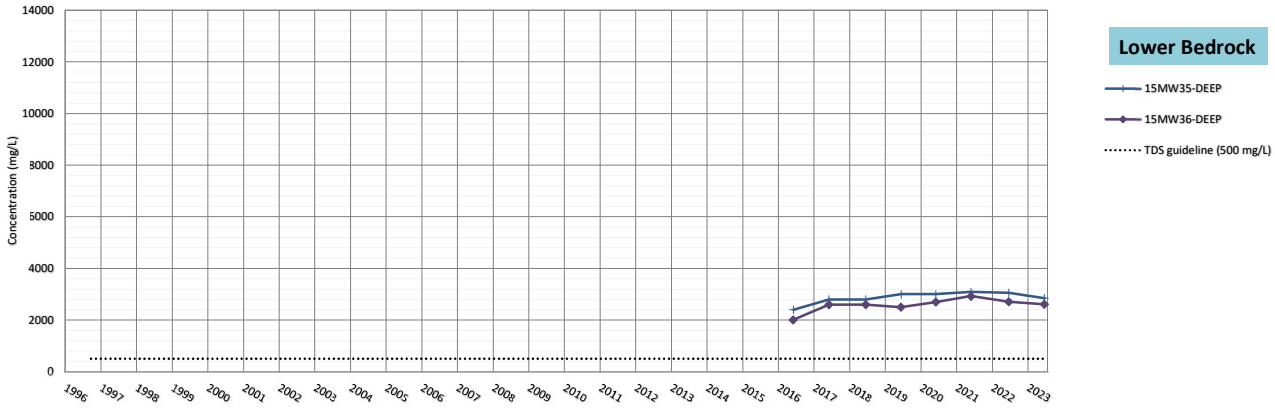


Appendix F5 - TDS Concentration Trends

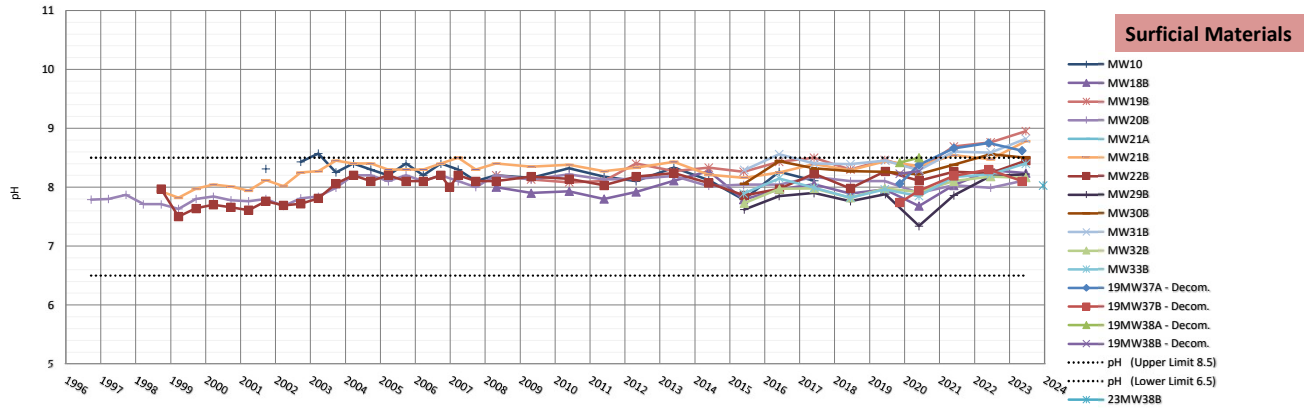


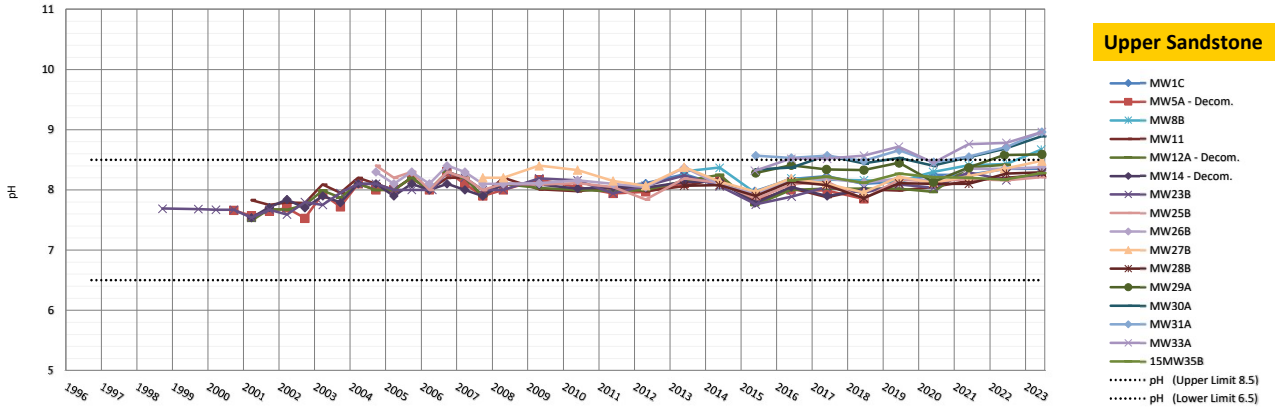


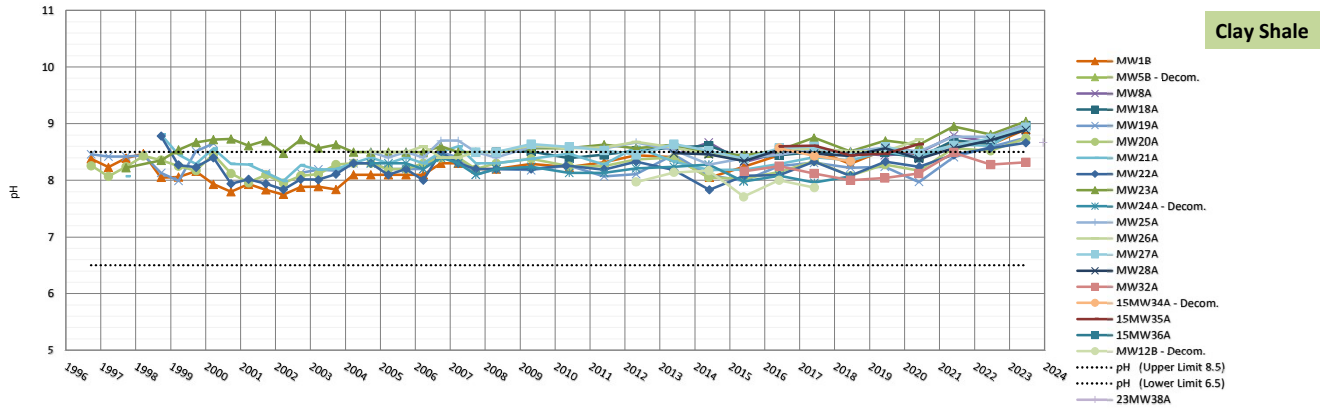


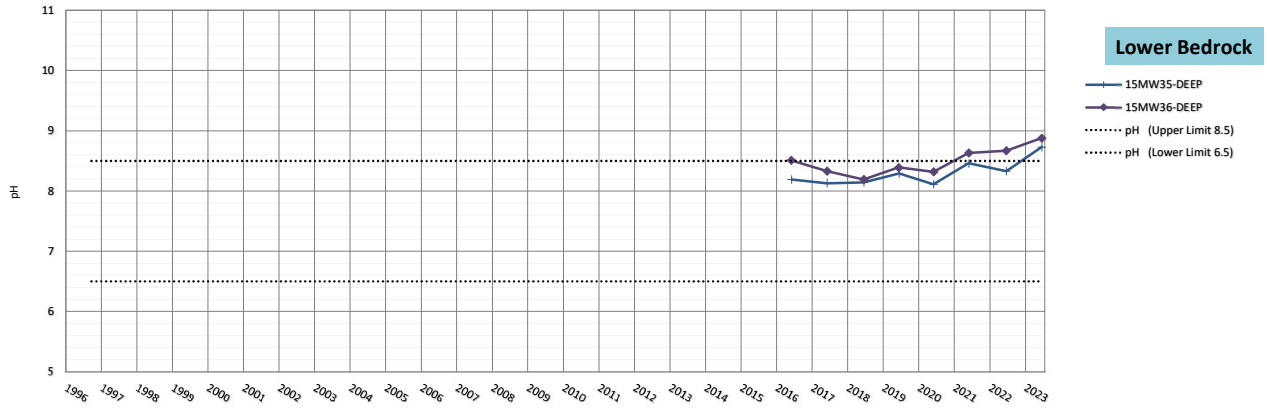


Appendix F6 - Lab pH Trends

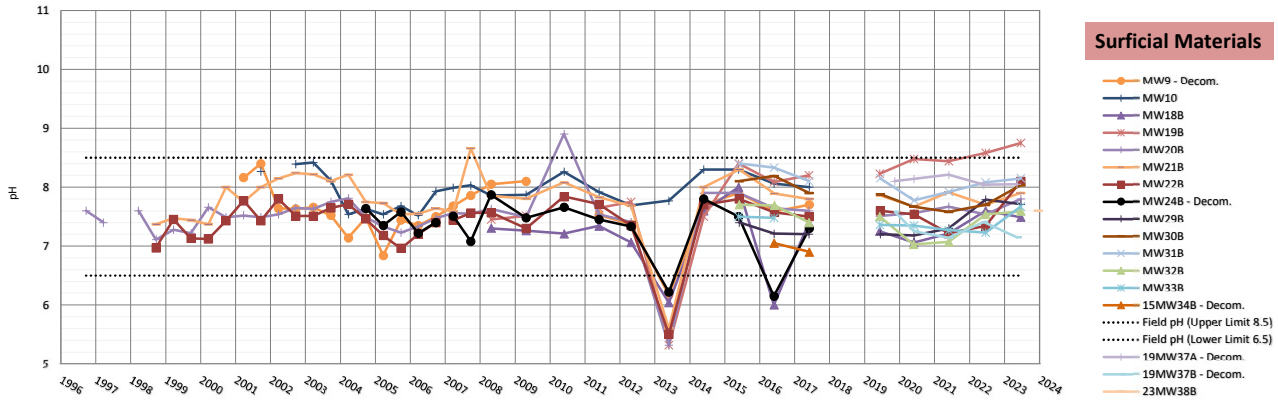


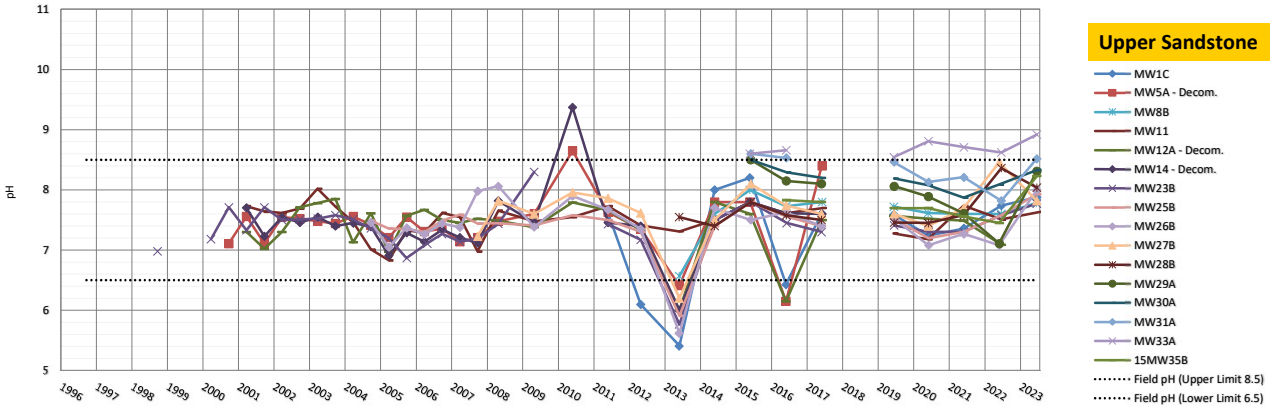


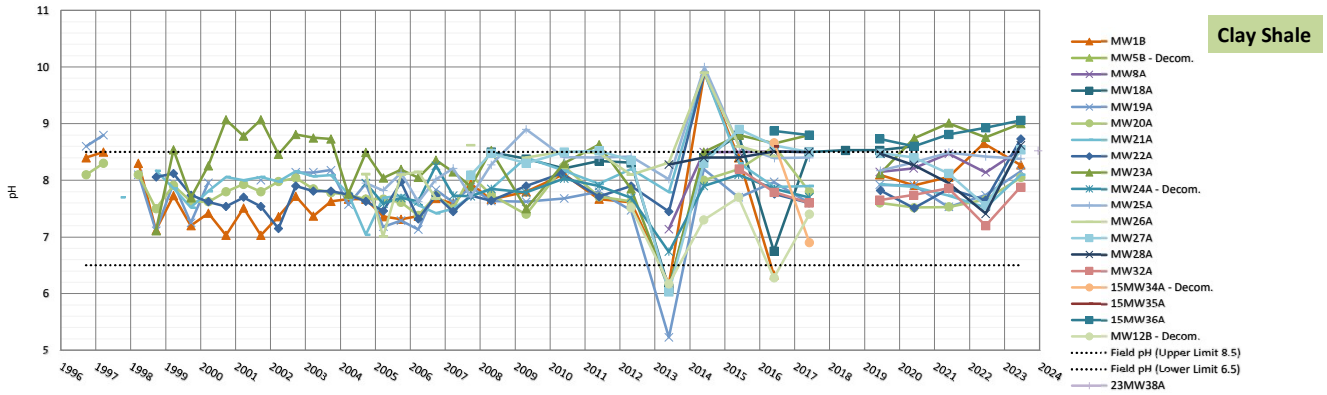


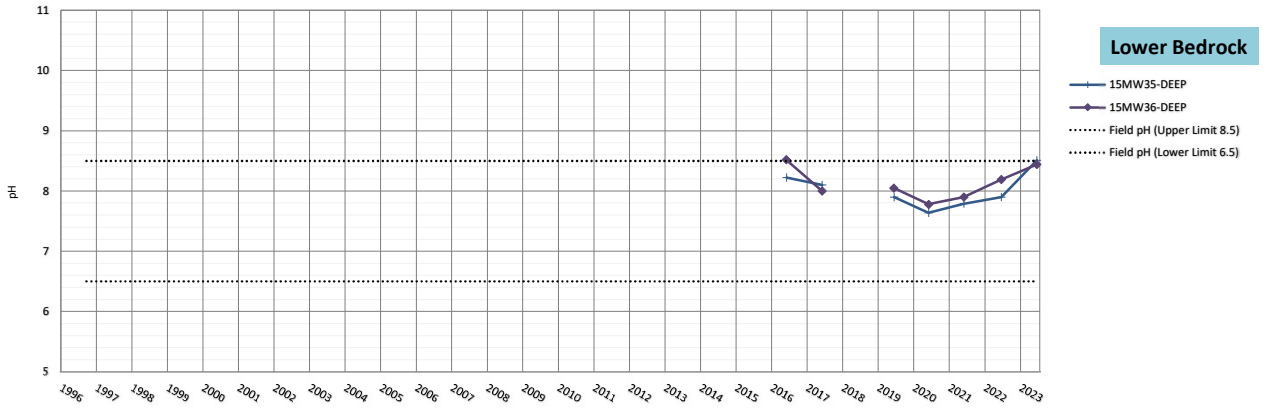


Appendix F7 - Field pH Trends

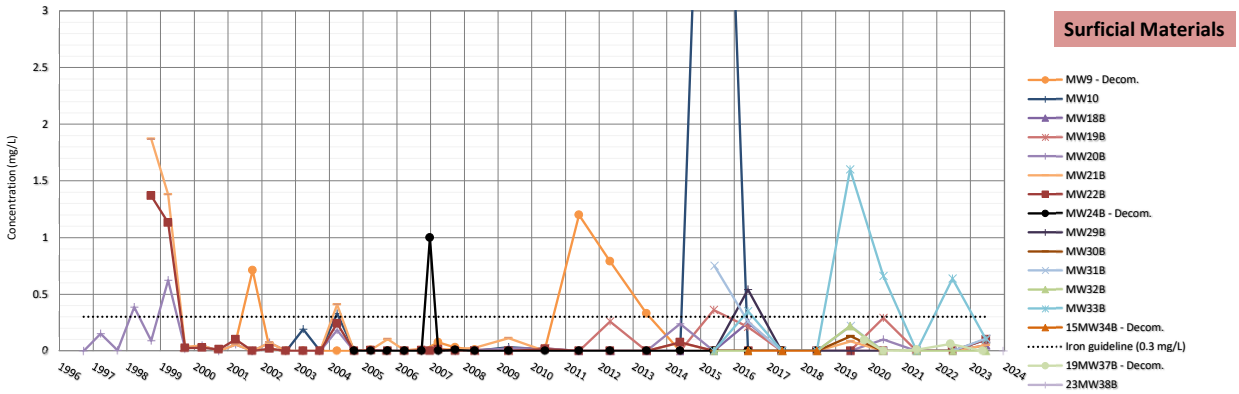


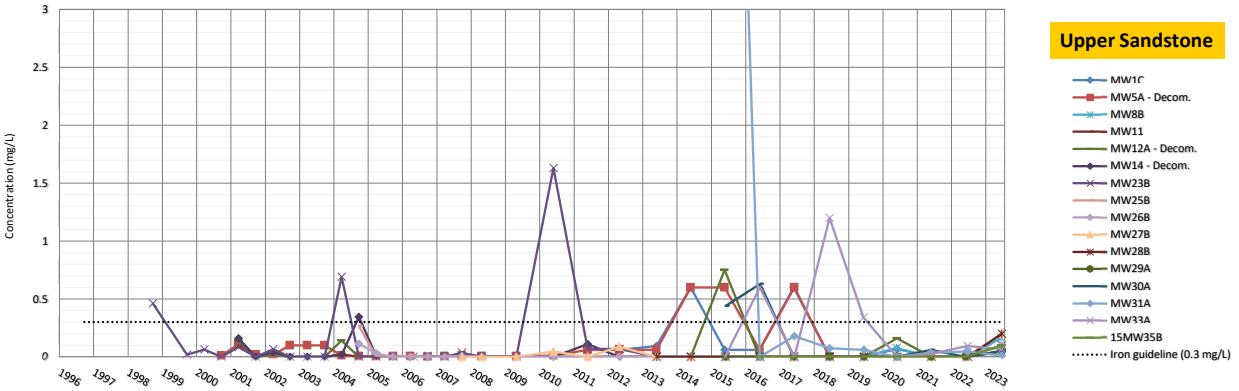


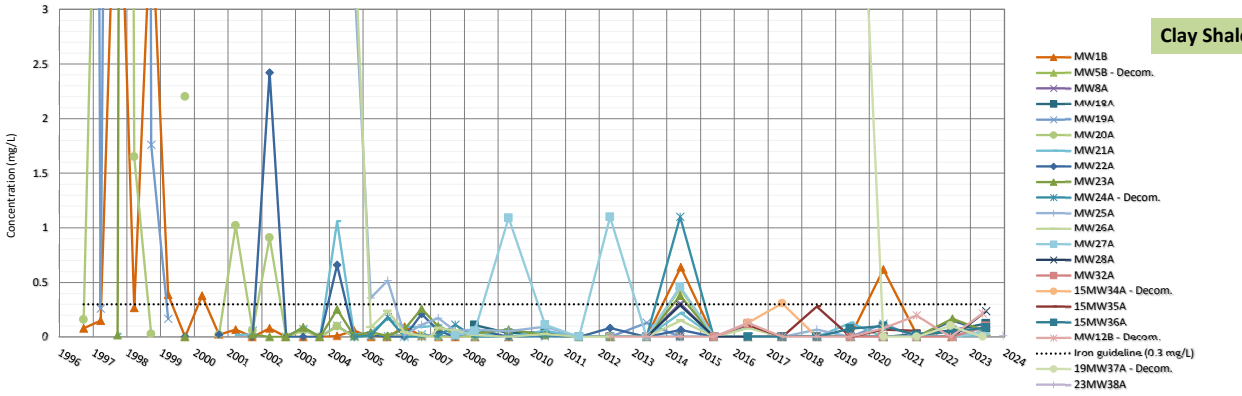


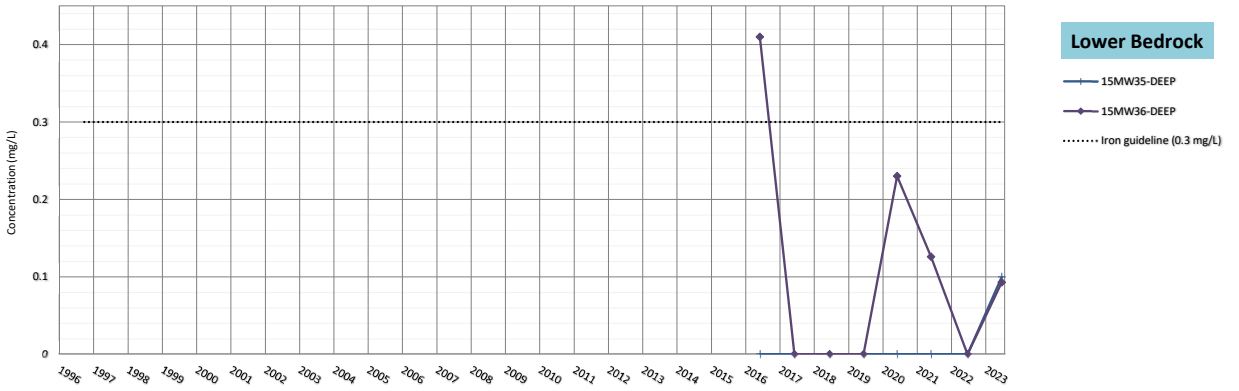


Appendix F8 - Iron Concentration Trends

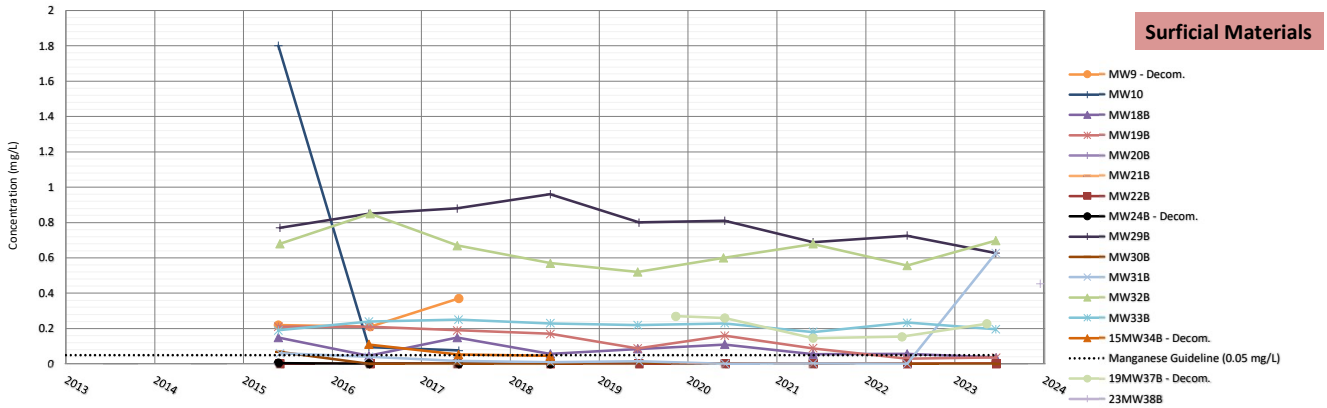


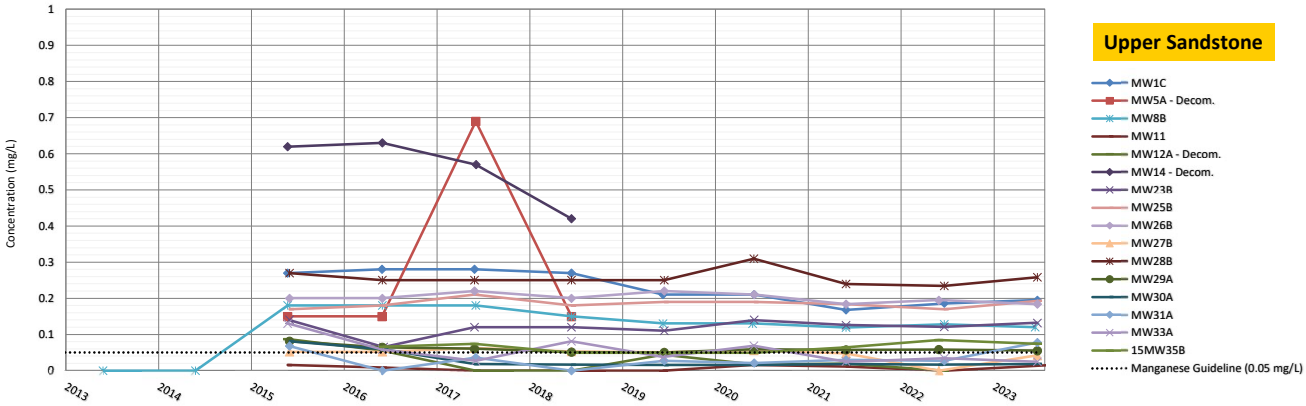


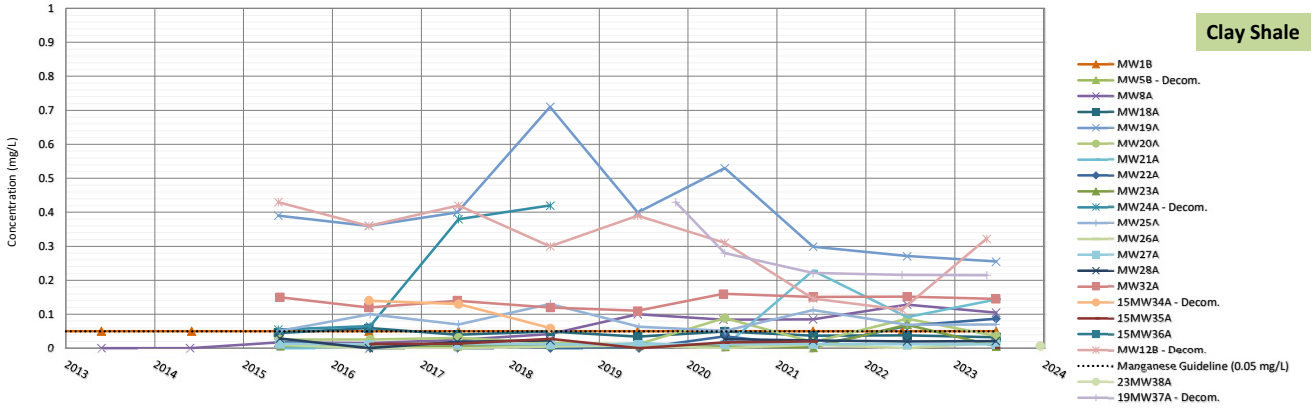


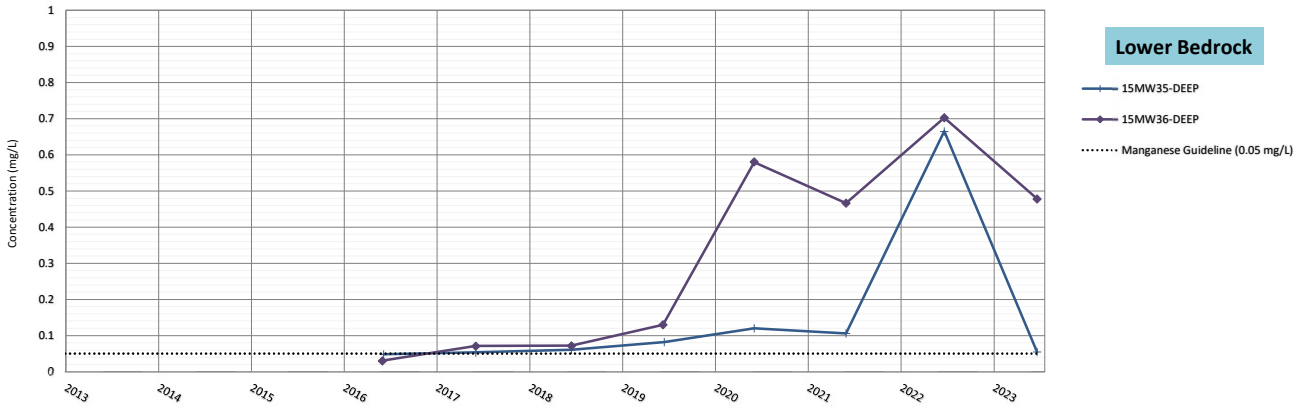


Appendix F9 - Manganese Concentration Trends

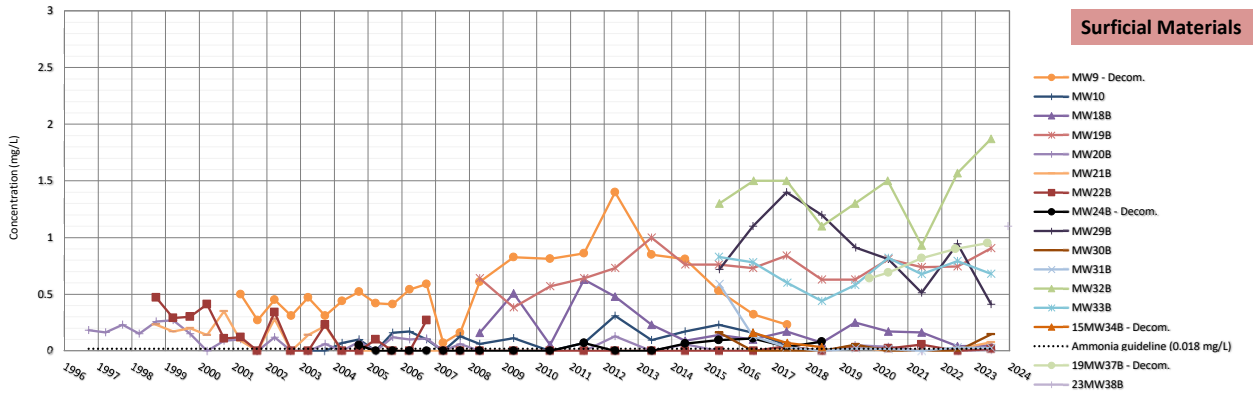


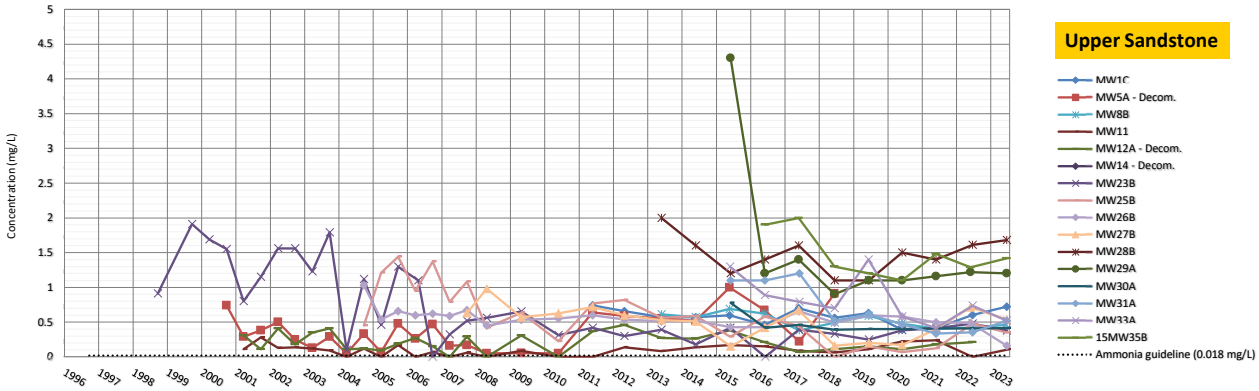


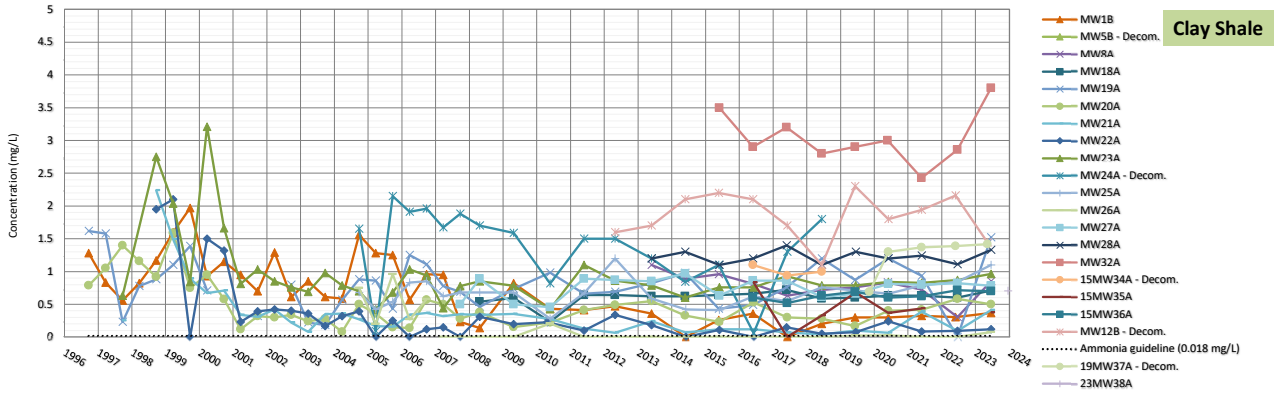


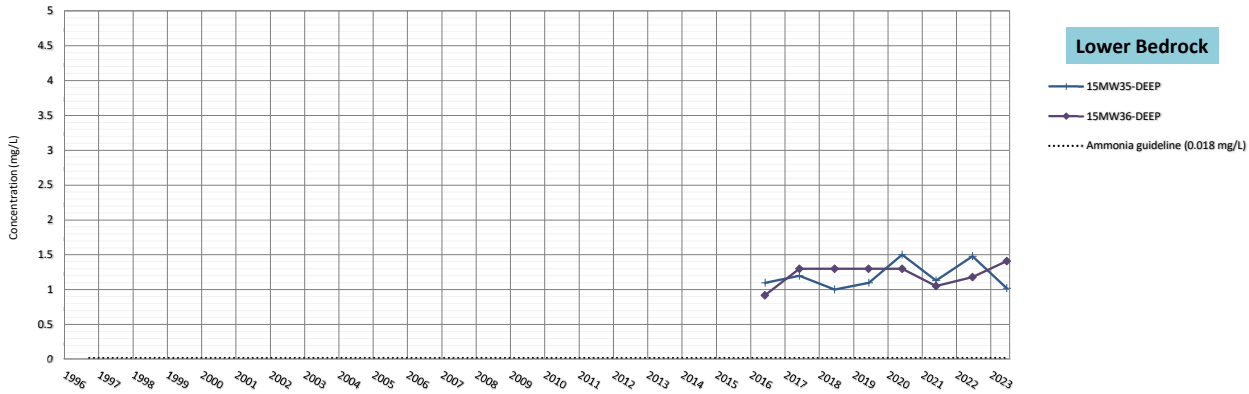


Appendix F10 - Ammonia Concentration Trends

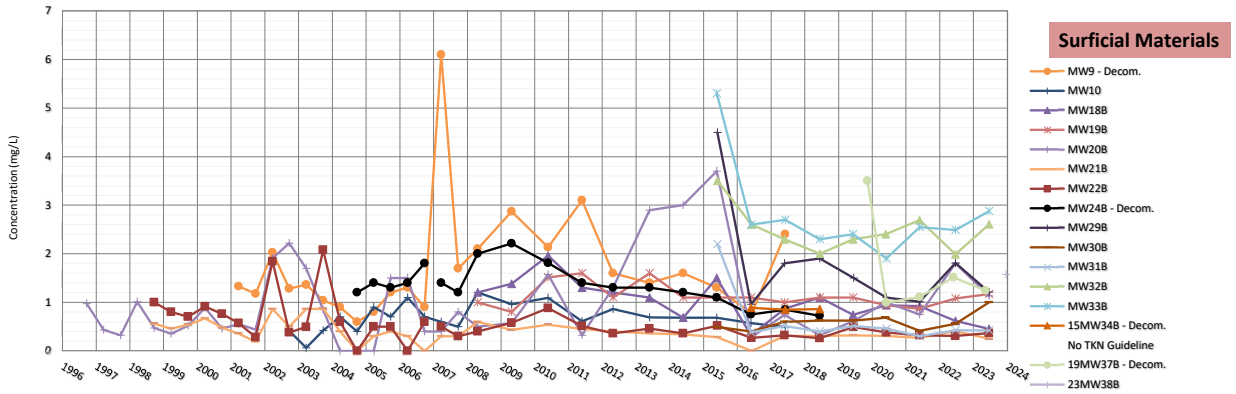


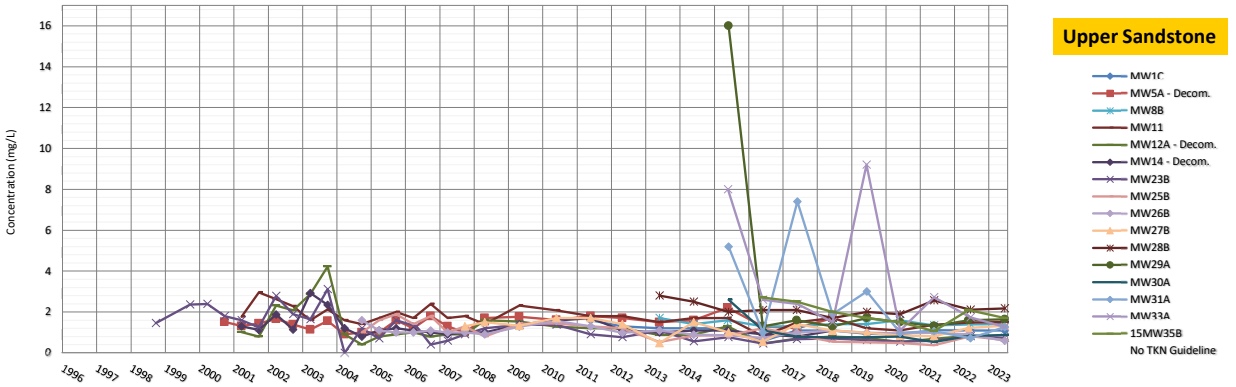


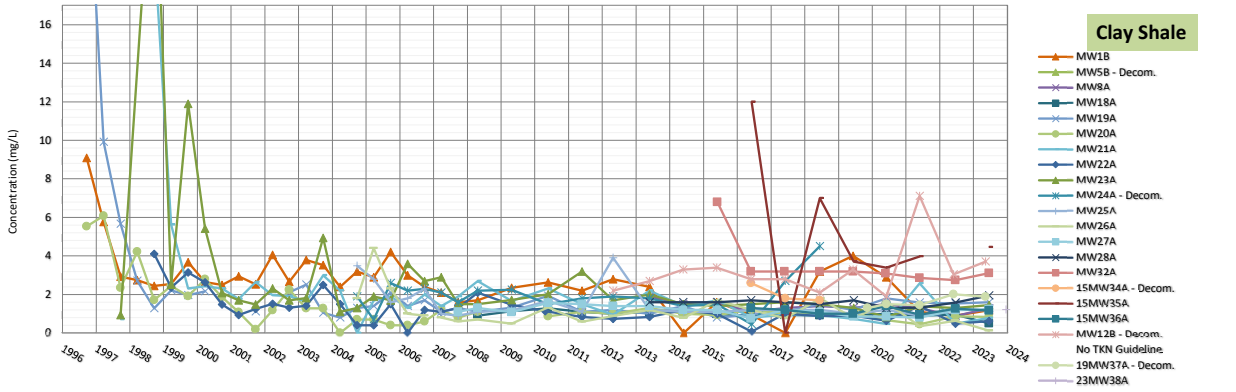


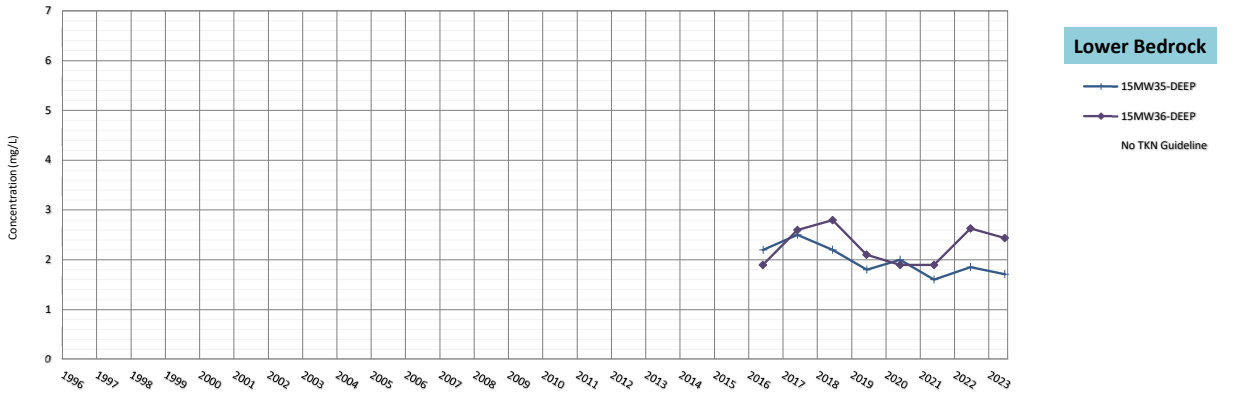


Appendix F11 - TKN Concentration Trends

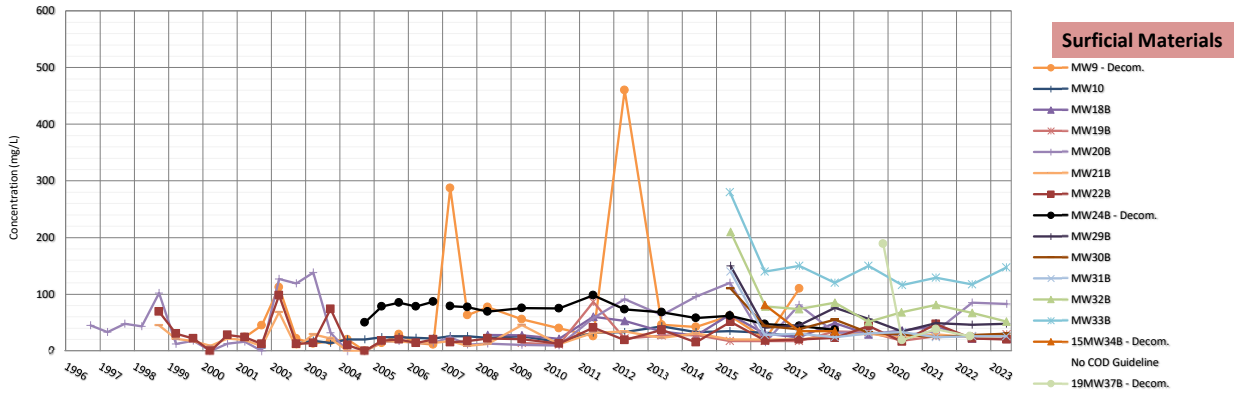


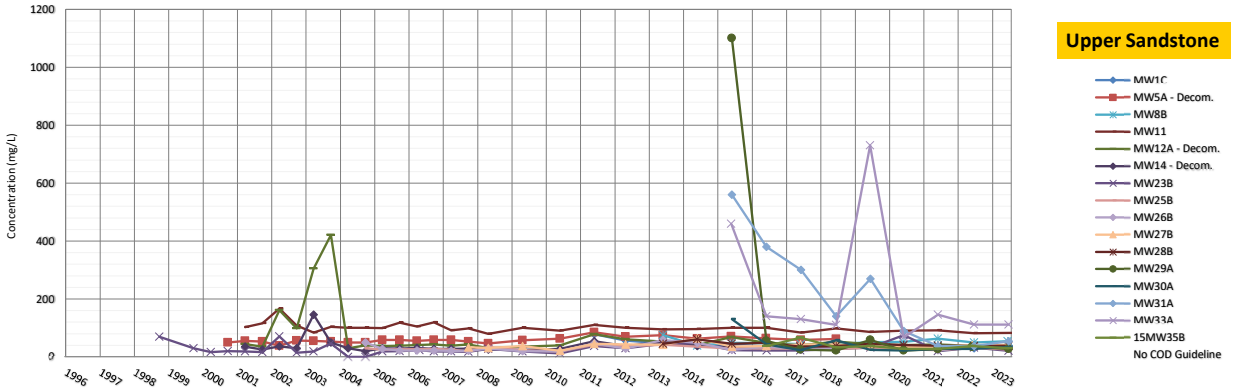


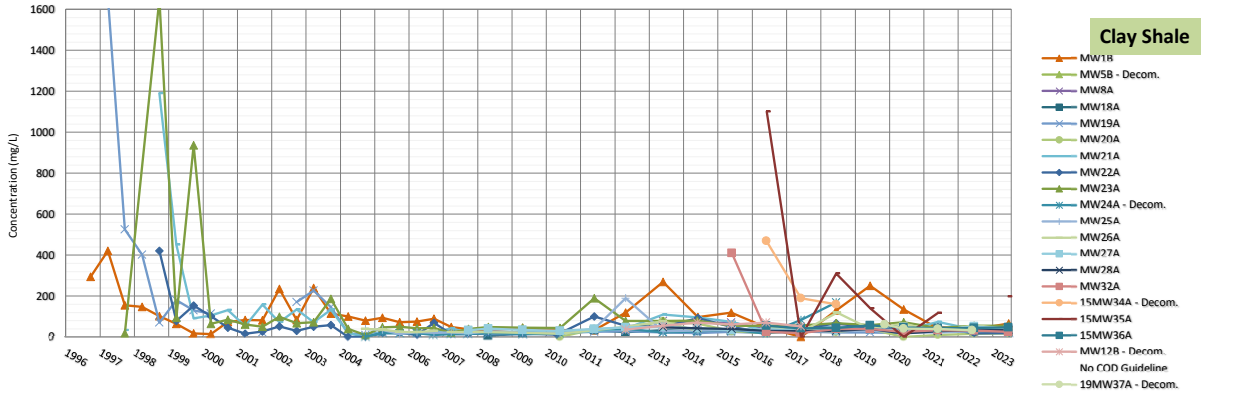


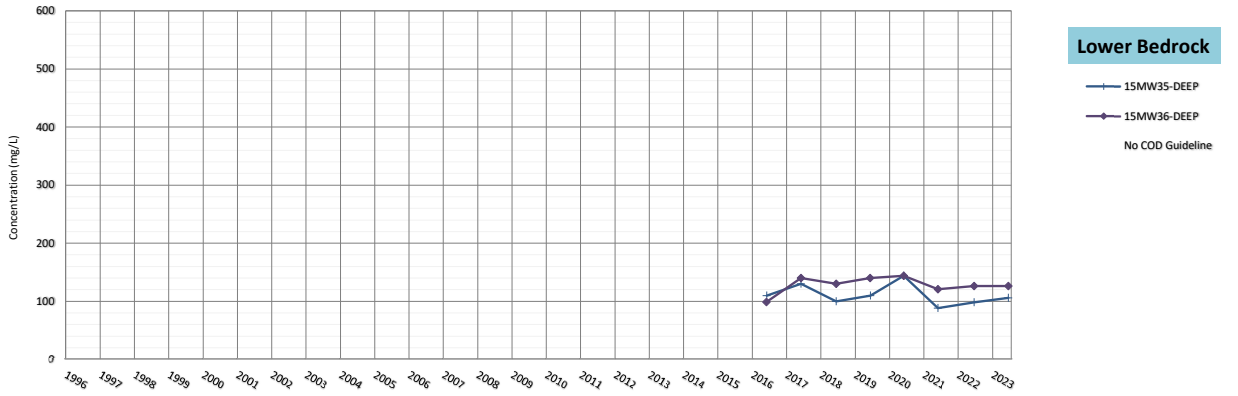


Appendix F12 - COD Concentration Trends

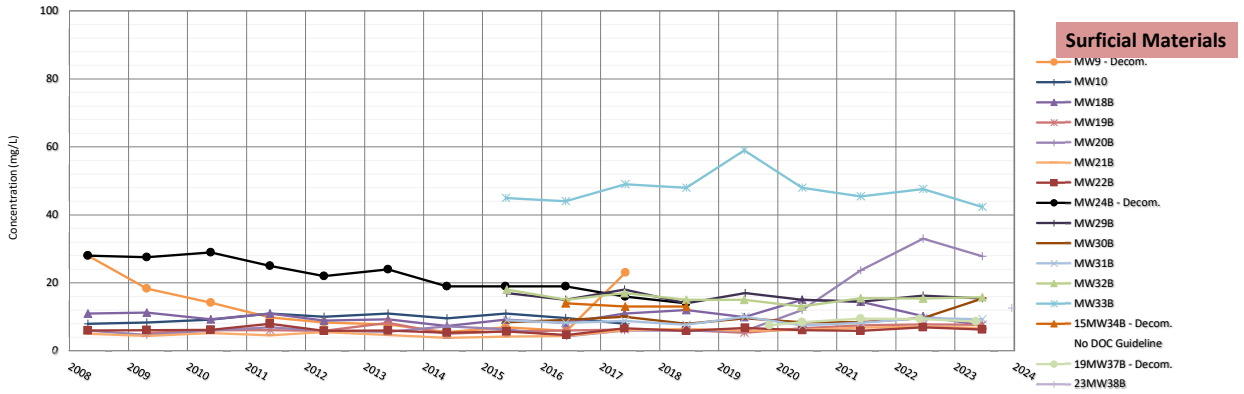


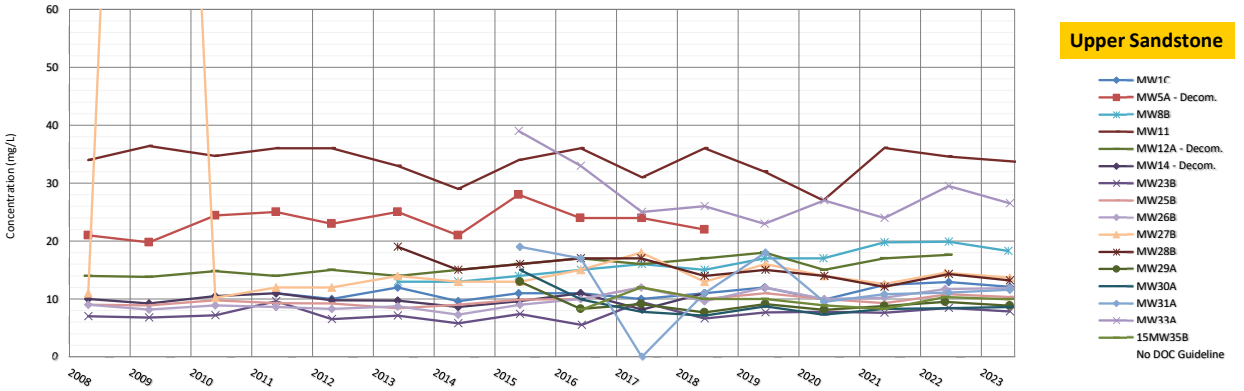


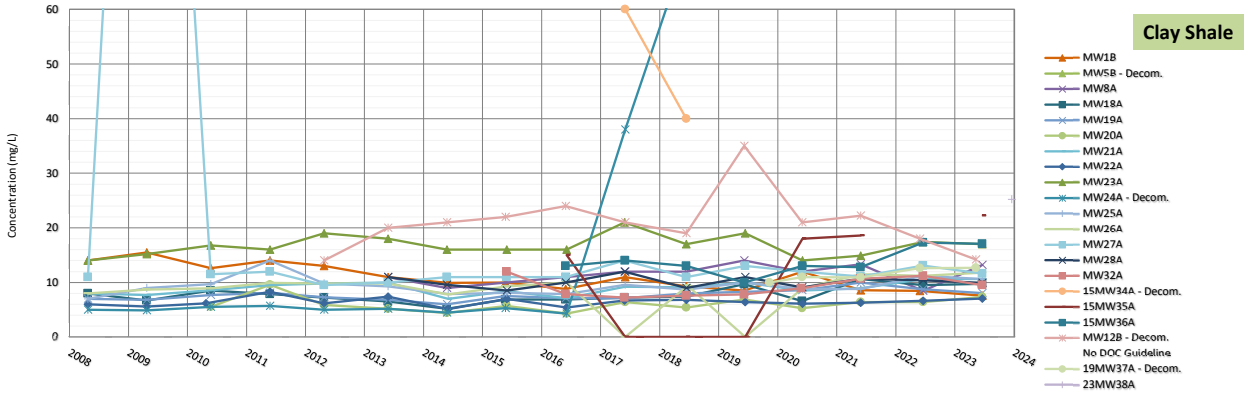


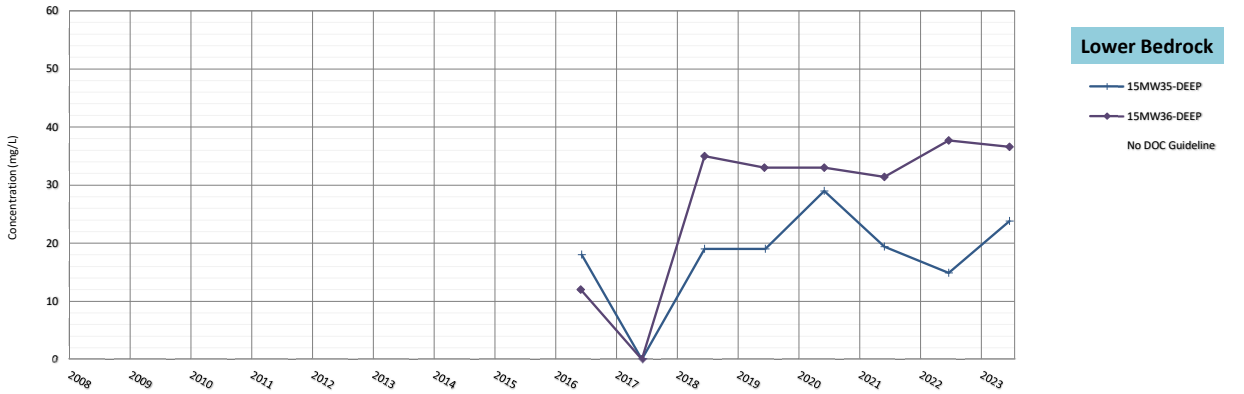


Appendix F13 - DOC Concentration Trends









APPENDIX G

TETRA TECH'S LIMITATIONS ON THE USE OF THIS DOCUMENT

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.

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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.

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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 third parties 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 exploration, 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.