2025 Groundwater Monitoring Report
Lindsay Thurber Comprehensive High School
Portion of NE and SE 21-38-27 W4M

PRESENTED TO

The City of Red Deer

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EXECUTIVE SUMMARY

The City of Red Deer (The City) retained Tetra Tech Canada Inc. (Tetra Tech) to conduct the 2025 groundwater monitoring and sampling program at the former landfill located north and east of the Lindsay Thurber Comprehensive High School (LTCHS). The site includes portions of Lot 1MR Plan 852 0510, Lot 4ER Plan 912 0819, and Lot S Plan 4154S, which contains the LTCHS (4204 – 58 Street). The site lies within the northeast and southeast portions of Section 21-38-27 W4M, in Red Deer, Alberta, hereafter referred to as the Site.

The objectives of the monitoring program were to assess the environmental condition of the Site and potential impacts on the environment related to the Site's former use as a landfill, including assessing the likelihood of interaction between groundwater at the former landfill and Gaetz Lake, and to provide recommendations related to risk management activities at the Site.

Tetra Tech's scope of work for the 2025 monitoring and sampling program at the LTCHS Site included conducting annual groundwater monitoring and sampling events at monitoring wells MW-02, MW-03, MW-04, BH8, and 22MW05, including measuring groundwater levels within each groundwater monitoring well and observing monitoring well integrity.

Based upon the results of the groundwater and soil vapour monitoring and sampling conducted in 2025 and previous years, Tetra Tech has developed the following conclusions:

- The groundwater elevations measured in October 2025 were used to infer a groundwater flow direction to the northwest, towards the Red Deer River. The average horizontal hydraulic gradient at the Site was approximately 0.002 m/m. The groundwater elevations decreased overall at all monitoring wells in 2025 compared to previous events, marking a change from the increasing or stable trend observed in recent years. Seasonal fluctuations have historically been observed at the monitoring wells, with spring elevations generally higher than the fall elevations.

- Based on a review of groundwater elevations from the monitoring well network and the 2023 datalogger recordings from Gaetz Lake and monitoring well 22MW05, immediately adjacent to Gaetz Lake (Tetra Tech 2024), Gaetz Lake appears to recharge the shallow groundwater west of the lake, with groundwater migrating toward the Red Deer River. The 2025 groundwater elevations agree with the previous assessment that groundwater within the footprint of the former landfill is migrating toward the Red Deer River rather than Gaetz Lake.

- Routine groundwater quality parameters and dissolved metals concentrations that exceeded the Tier 1 Guidelines at one or more monitoring wells in 2025 included total dissolved solids (TDS) and the dissolved metals arsenic, iron, and manganese. The measured concentrations of these parameters show leachate indicator parameters and anoxic conditions at the Site. Notably, the dissolved iron concentration at 22MW05 has increased compared to previous years. Dissolved barium concentrations remain stable at the Site, previous guideline exceedances are no longer observed due to the 2023 increase of the Tier 1 Guideline value from 1.0 mg/L to 2.0 mg/L. Dissolved ammonia concentrations at MW-04 and BH8 have also increased compared to previous years, though they remained below Tier 1 Guidelines.

- Sulphate concentrations were non-detectable at wells 22MW05, MW-04, and MW-03 in 2025. Although this was previously attributed to sulphate reduction, the increasing dissolved iron levels suggest this is unlikely. Instead, the negligible sulphate concentrations likely reflect the natural low-sulphate composition of the local river gravels rather than leachate impact.

- Concentrations of benzene, toluene, ethylbenzene, and xylenes (BTEX) were less than the analytical detection limits at all monitoring wells in 2025. In 2025, most volatile organic compound (VOC) concentrations measured less than the analytical detection limits and less than the Tier 1 Guideline. Detectable concentrations of VOC parameter 1,2-dichloroethene (cis) were measured at monitoring wells BH8, MW-02, and MW-03. The concentration at BH8 showed a slight increase compared to previous years, while the concentration at MW-02 showed a slight decrease; this VOC does not have an established Tier 1 Guideline.

- Vinyl chloride was detected at monitoring well BH8 (0.0027 mg/L) in 2025, marginally exceeding the Tier 1 Guideline. This was the first detectable concentration of vinyl chloride at the Site since 2021. Vinyl chloride is a byproduct of the degradation solvents commonly used in dry-cleaning as well as other industrial uses such as cleaning and de-greasing metals. The marginal exceedance suggests a minor landfill leachate impact.

- Monitoring and/or analytical testing of the vapour probes was not conducted in 2025 based on previous results that suggest there is little indication that vapour migration poses a hazard to receptors. Historical testing indicates the presence of landfill gas (LFG) (characterized by methane concentrations at and greater than the explosive range) in the landfill area; however, an interceptor trench is present between the waste mass and the LTCHS. Ongoing methane monitoring has been completed on behalf of the LTCHS, and recent results reported by North Shore Environmental Consultants Inc. (2025), included in Appendix E, suggest the interceptor trench is performing as intended, with methane concentrations measured on the LTCHS side of the interceptor trench remaining below applicable criteria.

- Overall, three of the five on-site monitoring wells showed minor/marginal concentrations of leachate indicator parameters in 2025.

Based upon the results of monitoring programs in 2025 and previous years, there are minor concentrations of leachate indicator parameters on-site; therefore, Tetra Tech recommends ongoing risk management, including ongoing monitoring and administrative actions. The following recommendations are made according to these risk management elements:

Ongoing Monitoring:

- Conduct a groundwater monitoring and sampling event in 2027 including monitoring wells MW-02, MW-03, MW-04, 22MW05, and BH8 to continue monitoring the groundwater flow pattern and groundwater quality, and to maintain an audit trail of environmental conditions. Further monitoring is not recommended at the monitoring wells located next to LTCHS (MW04A, MW05A, MW14A, and MW15A).

- Collect a groundwater sample from monitoring well BH8 in 2026 to confirm the presence of vinyl chloride and continue monitoring its concentration following the Tier 1 Guideline exceedance in 2025. The sample should be analyzed for the same parameters as previous samples—routine water chemistry, ammonia, dissolved metals, BTEX, petroleum hydrocarbons (PHCs), and volatile organic compounds (VOCs). This work can be completed in conjunction with other monitoring programs in the area.

- Conduct an annual site walkover when there is no snow cover to monitor areas of thin cover and confirm the ground surface and vegetation cover remain intact. Maintaining the vegetation cover will help prevent soil exposure and mitigate the potential for waste exposure at the ground surface and will also limit rainfall infiltration and associated leachate generation. If areas of thin cover are observed, corrective action should be considered as appropriate.

Administrative Actions:

- The interceptor trench adjacent to the LTCHS is operated and monitored by the LTCHS and we understand that the LTCHS provides periodic updates of the program status to The City. Based on historical and recent monitoring results, the interceptor trench appears to be performing as intended. Annual monitoring and reporting should continue to confirm the interceptor trench is operating properly and to support ongoing management activities at this Site. We recommend that The City obtain and review the collected monitoring data on an annual basis.
- Utilize the revised generic mitigative measures, described in Appendix B, when evaluating applications for development within the setback.
- Ensure that the Site is clearly identified within The City's Land Use Bylaw and appropriate administrative requirements are met for the Site in accordance with City policies.

Further to the above recommendations, as noted, the Site remains an historical landfill. It presently appears to be well maintained and capped. The City should review this status on an ongoing basis to ensure that the cover remains intact, and drainage remains positive; repairs or maintenance should be undertaken as required to maintain the Site. We note that the design and operation of the interceptor trench adjacent to the LTCHS was developed based on surface conditions similar to existing, and if changes or improvements to the surface of the landfill are contemplated (e.g., paving or installation of an impermeable cap), such work should be undertaken in conjunction with a review of the interceptor trench design and performance.

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LIMITATIONS OF REPORT

This report and its contents are intended for the sole use of The City of Red Deer 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 The City of Red Deer, 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 A or Contractual Terms and Conditions executed by both parties.

1.0 INTRODUCTION

The City of Red Deer (The City) retained Tetra Tech Canada Inc. (Tetra Tech) to conduct the 2025 groundwater monitoring and sampling program at the former landfill located north and east of the Lindsay Thurber Comprehensive High School (LTCHS). The site includes portions of Lot 1MR Plan 852 0510, Lot 4ER Plan 912 0819, and Lot S Plan 4154S, which contains the LTCHS (4204 – 58 Street). The site lies within the northeast and southeast portions of Section 21-38-27 W4M, in Red Deer, Alberta, hereafter referred to as the Site.

The scope of work for 2025 presented in Section 1.1 was based on Tetra Tech's 2023 groundwater monitoring and sampling program conducted at the Site. Those results were presented and discussed in the 2023 Groundwater Monitoring Report – Lindsay Thurber Comprehensive High School (Tetra Tech 2024).

The objectives of the monitoring program were to assess the environmental condition of the Site and potential impacts on the environment related to the Site's former use as a landfill, including assessing the likelihood of interaction between groundwater at the former landfill and Gaetz Lake, and to provide recommendations related to risk management activities at the Site.

The field components of the monitoring program were completed under Tetra Tech's detailed work plans encompassing the scope of work outlined in Section 1.1 below. The current report was completed under Tetra Tech's Limitations on the Use of this Document for conducting environmental work. A copy of these conditions is provided in Appendix A.

1.1 Scope of Work

Based on the 2023 findings and recommendations (Tetra Tech 2024), the 2025 monitoring program scope of work was outlined in the proposal titled 2025 Work Scope and Cost Estimate dated September 10, 2025 (Tetra Tech 2025). The work conducted in 2025 included the following activities:

- Conducting annual groundwater monitoring events at monitoring wells MW-02, MW-03, MW-04, BH8, and 22MW05, including measuring groundwater levels within each groundwater monitoring well and observing monitoring well integrity.
- Conducting annual groundwater sampling events at monitoring wells MW-02, MW-03, MW-04, BH8, and 22MW05:
  - Purging all five monitoring wells until practically dry or until a minimum of three well volumes had been removed and allowing the water levels in the wells to recover.
  - Measuring field parameters (pH, electrical conductivity [EC], and water temperature) at the time of sampling.
  - Collecting groundwater samples from each well and submitting the samples for laboratory chemical analyses.
  - Collecting one duplicate groundwater sample for quality assurance/quality control (QA/QC) purposes during each sampling event.
- Conducting monitoring well repairs, as required.
- Preparing an annual report summarizing the field activities undertaken for the year and interpreting groundwater elevations and groundwater analytical results.

Groundwater monitoring was not conducted at the monitoring wells located next to the LTCHS (MW04A, MW05A, MW14A, and MW15A) as per the recommendations in the 2023 groundwater monitoring report.

2.0 BACKGROUND INFORMATION

2.1 General Information

The Site is located within three parcels within NE and SE 21-38-27 W4M:

- Portion of Lot S, Plan 4154S;
- Portion of Lot 1MR, Plan 852 0510; and
- Portion of Lot 4ER, Plan 912 0819.

Figure 1 shows the general site location. Historical waste disposal reportedly occurred between June 1965 and July 1967, indicating that the waste was placed approximately 60 years ago. The original LTCHS facility existed prior to historical placement of waste. Since then, the LTCHS has been expanded to its current configuration, and the historical disposal area lies within approximately 30 m of the existing LTCHS. Nearby developments include other public institutions, and residential and commercial land use.

Historical waste placement reportedly occurred with acknowledgement from the Provincial Health Region and the local School District. No buildings are located on the area of the historical waste disposal. A paved pedestrian/bike path is located across the historical waste area. The path connects the south side of the LTCHS Legion Track to Gaetz Lake to the east, the Parkland School (west of the Site), and the Kerry Wood Nature Centre (northwest of the Site). Part of the Legion Track is located within the south end of the historical waste disposal area, and an environmental reserve area with oxbow lakes (Gaetz Lakes) is located to the northeast. The west and north margins of the waste area are open undeveloped fields with two baseball diamonds adjacent to the west side. MW-02, MW-03, and VW-02 are located outside the Site boundary. Figure 2 shows the Site location and surrounding land use. Additional information on the Site history, historical groundwater monitoring investigations, geology, and hydrogeology can be found in Appendix B. Cross-sections that were prepared by Tiamat Environmental Consultants Ltd. ([Tiamat] 2014) using the wells previously installed at the Site in 2013 are included in Appendix C.

2.2 2025 Conceptual Site Model Summary

The selection of comparative guidelines is based on the conceptual site model (CSM), which outlines the rationale for the selection of applicable exposure pathways and receptors at the Site. This evaluation is based on guidance presented in the Alberta Tier 1 Guidelines (Alberta Environment and Protected Areas [Alberta EPA] 2024). The CSM that was developed for the Site in the 2021 and 2022 groundwater and soil vapour monitoring report (Tetra Tech 2022) included the following items:

- Description of identified environmental issues including a description of processes or activities undertaken at or near the Site and a listing of chemicals of potential concern (COPCs) identified in earlier investigations.
- Description of known and reported historical releases, including locations and status of any subsequent environmental site assessments (ESAs) and remediation.
- Identification of applicable exposure pathways and receptors.

The CSM is summarized in the table, below.

Table 2-1: Summary of Exposure Pathways and Receptors for Soil and Groundwater

Release Mechanism	COPC	Migration Pathway	Potential Receptor
Leachate infiltration into foundation soils or seepage through cover.	Inorganic parameters and nutrients, metals, petroleum hydrocarbons (PHCs), volatile organic compounds (VOCs), and other indicator parameters (i.e., biochemical oxygen demand [BOD] and chemical oxygen demand [COD]).	Direct soil contact.	Human users of the parkland; ecological plants and soil invertebrates.
		Groundwater ingestion (drinking water).	Domestic use aquifer (DUA) drinking water; freshwater aquatic life (FAL) in Gaetz Lake.
		Nutrient and energy cycling.	Microbial functioning of the soil.
Landfill gas (LFG) emissions.	VOCs, methane, benzene, toluene, ethylbenzene, and xylenes (BTEX) and PHC fractions, and siloxanes.	Vapour inhalation.	Human users of the parkland; users of the LTCHS.

2.2.1 Data Evaluation

To establish the appropriate guidelines for the Site, residential land use criteria were used. The receptors are a combination of the degree of potential exposure, the exposure pathway, and the contaminants of concern. Human receptor exposures applicable to the Site include the direct soil contact and inhalation pathways. The ecological receptor exposures applicable to the Site include direct soil contact and nutrient and energy cycling. Previous investigations at the Site have determined that the dominant soil stratigraphy governing transport at the Site is coarse grained.

The CSM determined that the most applicable guidelines for groundwater results for the Site were as follows:

- Groundwater concentrations at the Site were compared to the Tier 1 Guideline (Alberta EPA 2024) under residential and parkland land use for coarse-grained soils.

2.3 Monitoring Well Network

The 2025 monitoring program included five groundwater monitoring wells (MW-02, MW-03, MW-04, BH8, and 22MW05). Groundwater well MW-01 has not been located and is assumed to have been destroyed. The groundwater wells are all installed outside of the waste footprint. Monitoring wells MW-02 and MW-04 are screened in sand and gravel fill material. Monitoring well MW-03 is reportedly installed 100 m to the northwest of the historical waste disposal area and is screened in sand fill. Monitoring well 22MW05 was installed in February 2022 on the northeast side of the Site, approximately 20 m west of Gaetz Lake and is screened in sand and gravel. Monitoring well BH8 is located on the southeast side of the waste disposal area, approximately 50 m west of Gaetz Lake, and is screened in the dirty gravel typical of the banks of the Red Deer River. Monitoring wells MW04A, MW05A, MW14A, and MW15A are located along the perimeter of the east side of the LTCHS and were not included in the 2025 monitoring and sampling program.

Monitoring well completion details are summarized in Table 1 and the well locations are shown on Figure 2.

We understand that historically there have been a number of additional wells and gas probes installed as part of previous assessments, including wells installed as part of the gas mitigation described in Section 5.1. These were not located or monitored as part of this program.

3.0 MONITORING AND SAMPLING PROGRAM

A discussion of the methods used for the fieldwork, laboratory testing, and data evaluation is presented in the following sections.

3.1 Groundwater Monitoring and Sampling Program

A discussion of the methods used for groundwater monitoring and sampling fieldwork and laboratory testing is presented in the following section. In 2025, Tetra Tech conducted groundwater monitoring and sampling on October 15 (monitoring and purging) and October 16 (sampling).

The methodology for groundwater monitoring and sampling included the following:

- Observing the integrity of each well and noting drainage and site conditions near the well that may have an effect on monitoring results or groundwater quality.
- Measuring static groundwater levels in each monitoring well with an interface probe and recording total depths confirming absence of non-aqueous phase liquids (NAPLs).
- Recording of field data on standardized forms as documented in Tetra Tech standard operating practices.
- Purging each monitoring well requiring sampling using dedicated polyethylene bailers or Waterra tubing with inertial pump foot valves of at least three well volumes of water, or until the well was practically dry.

Following the completion of groundwater monitoring and purging, groundwater samples were collected from the required wells using the procedures identified below:

- Groundwater samples were collected from five monitoring wells (MW-02, MW-03, MW-04, BH8, and 22MW05) and placed into appropriate laboratory supplied, sterile glass and plastic vials and bottles for the required analytical package. If required, samples were filtered and/or preserved in the field.
- Field measurements were taken for pH, EC, and temperature at the time of sampling.
- Samples were submitted in coolers with ice to ALS Laboratory Group (ALS) in Calgary, Alberta, for laboratory analysis under chain-of-custody (COC) documentation.

More information on the analytical program is provided in Section 3.2.1. The groundwater monitoring well locations are shown on Figure 2.

3.1.1 Analytical Program

The analytical program for the groundwater monitoring wells was developed based on previous recommendations and is summarized below:

- Routine water chemistry and dissolved metals.
- Ammonia.
- BTEX.
- VOCs.

4.0 RESULTS AND DISCUSSION

This section presents the results of the fieldwork conducted in 2025 at LTCHS and discussions of these results.

4.1 Groundwater Elevations

In 2025, Tetra Tech monitored five groundwater monitoring wells (MW-02, MW-03, MW-04, BH8, and 22MW05) during the October monitoring event. The measured groundwater levels and calculated groundwater elevations for 2025 are presented in Table 1.

Figure 3 presents the groundwater elevation trends (hydrographs) for the groundwater monitoring wells. These plots show the groundwater elevations since 2013. The groundwater elevations decreased overall at all five monitoring wells in 2025 compared to previous years, marking a change from the increasing or stable trends observed in previous years.

The average depth to groundwater in the monitoring wells was 2.85 m below grade (mbg) in October 2025. The groundwater elevations and interpreted elevation contours are shown on Figure 4. The interpreted contoured elevations for the monitoring wells suggest the groundwater flow is to the northwest. The average horizontal gradient in 2025 was 0.002 m/m towards the Red Deer River, located to the northwest of the Site. The gradient is steepest in the northwest portion of the Site, towards the river valley, which may indicate restriction of the northwestward flow of groundwater from the Site to the Red Deer River. The horizontal gradient and inferred groundwater direction are consistent with previous results.

Based on the above information and historical data (Tetra Tech 2024), the primary groundwater flow direction at the Site is towards the Red Deer River, and the findings do not suggest that groundwater within the footprint of the former landfill discharges towards Gaetz Lake.

4.2 Groundwater Field Parameters

Field measurements for temperature, pH, and EC in October 2025 are shown in Table 2. A discussion of the results of the field tests is summarized in this section.

Groundwater temperatures ranged from 8.81°C (MW-02) to 11.53°C (MW-04).

In 2025, field pH values ranged from 7.00 (BH8) to 7.34 (MW-04) and field EC measurements ranged from 930 µS/cm (MW-04) to 1,342 µS/cm (BH8). The difference between field and laboratory pH and EC values may be due to the limitations of the field equipment, differences in sample temperature, and potential changes in sample chemistry that occur during transport to the laboratory.

4.3 Groundwater Analytical Results

The groundwater analytical data for 2025 is summarized in Table 2. The laboratory analytical reports are included in Appendix D and historical tables are included in Appendix E.

4.3.1 Background Groundwater Characteristics

Monitoring well MW-01 was located southwest of the former landfill in a location that is hydraulically up-gradient or cross-gradient. The well is assumed to have been destroyed, and background groundwater quality results have been inferred from the 2013 analytical results from MW-01, included in Appendix E.

The 2013 concentration of dissolved manganese (1.3 mg/L) at MW-01 was within the range of dissolved manganese concentrations measured at the Site in 2025, which ranged from 0.455 mg/L to 1.68 mg/L. The 2013 dissolved iron and dissolved boron concentrations in MW-01 were non-detect, while nitrate was present at a concentration of 4.8 mg/L. These parameter concentrations, along with a relatively low 2013 ammonia concentration of 0.18 mg-N/L, do not suggest that the water quality at MW-01 in 2013 was affected by leachate. The concentration of chloride at MW-01 in 2013 was 110 mg/L, which is greater than the concentrations of chloride measured at other wells in 2025. It should, however, be noted that MW-01 is the only monitoring well on site that is located near a roadway, suggesting the groundwater quality may be influenced by road salt. The 2013 concentrations of BTEX, PHC fractions F1 and F2, and VOCs at MW-01 were less than their respective analytical detection limits. In 2025, BTEX and PHC fractions F1 and F2 concentrations were also less than the analytical detection limits at the monitored wells.

4.3.2 Routine Water Chemistry Parameters

The 2025 total dissolved solids (TDS) concentrations were greater than the Tier 1 Guideline of 500 mg/L at all five monitoring wells, ranging from 568 mg/L at MW-04 to 814 mg/L at BH8 and were consistent with historical results. Elevated TDS concentrations often occur in groundwater as a result of the dissolution of naturally occurring salts and minerals in Alberta, and do not necessarily indicate groundwater quality impacts related to the former landfill.

Chloride continues to be detected across the monitoring network, with concentrations ranging from 38.4 mg/L at MW-03 to 93.3 mg/L at MW-02. These concentrations are less than the Tier 1 Guideline and are consistent with historical results observed at the Site.

Ammonia concentrations ranged from 0.465 mg-N/L at MW-04 to 3.38 mg-N/L at 22MW05. Although the 2025 concentrations at MW-04 (0.465 mg-N/L) and BH8 (0.678 mg-N/L) had increased compared to previous years, all reported concentrations remained below the site-specific Tier 1 Guideline of 6.75 mg-N/L.

Sulphate concentrations were non-detectable (<1.50 mg/L) at monitoring wells 22MW05, MW-04, and MW-03 in 2025 north and northwest of the Site. These wells also have the lowest TDS and chloride concentrations, ammonia is negligible to low, dissolved iron and arsenic are present and increasing, and manganese concentrations are stable. The absence of detectable sulphate is likely a combination of influence from fresh(er) water because of their position relative to the lake and river, the naturally low sulphate composition of the river gravels, as well as sub reducing conditions, indicating limited groundwater circulation in this area.

4.3.3 Dissolved Metals

Iron and manganese are redox-sensitive parameters that also occur in groundwater under anaerobic conditions and can help determine whether the groundwater quality is affected by biodegradation reactions, for instance related to landfill leachate. The dissolved manganese concentrations were greater than the Tier 1 Guideline (0.02 mg/L) at all five monitoring wells during the sampling event in 2025, ranging from 0.455 mg/L at MW-02 to 1.68 mg/L at 22MW05. The dissolved iron concentrations were also greater than the Tier 1 Guideline (0.3 mg/L) at all monitoring wells in 2025, ranging from 0.654 mg/L at BH8 to 24.0 mg/L at 22MW05. The measured dissolved iron concentration at 22MW05 in 2025 (24.0 mg/L) showed an increase compared to previous years. However, manganese and iron

naturally occur in groundwater under anaerobic conditions and concentrations of these parameters do not necessarily indicate landfill leachate impact on groundwater quality.

Concentrations of dissolved arsenic were greater than the Tier 1 Guideline (0.005 mg/L) at four monitoring wells in 2025: 0.0193 mg/L at 22MW05, 0.0136 mg/L at MW-04, 0.0097 mg/L at MW-02, and 0.0343 mg/L at MW-03. Arsenic is known to be strongly adsorbed onto iron(hydr)oxides, and when iron and manganese dissolve, arsenic will also go into solution (Hem 1992). The concentrations of dissolved arsenic are likely correlated to the presence of dissolved iron. Dissolved arsenic concentrations that exceeded the Tier 1 Guideline in 2025 were possibly related to deeper anoxic conditions and consequently, higher dissolved iron concentrations.

Dissolved barium continues to be present in groundwater at the Site, with concentrations in 2025 ranging from 0.515 mg/L at MW-02 to 1.91 mg/L at MW-03. All dissolved barium concentrations in 2025 were less than the Tier 1 Guidelines (2 mg/L) and have been fairly stable. The previously recorded exceedances were the result of a lower Tier 1 Guideline in the 2019 version of the guidelines. The barium that is present in the samples likely came from the dissolution of barium carbonate and it remains in solution due to a combination of a reducing environment and a slightly alkaline pH.

4.3.4 Organic Parameters

Concentrations of BTEX were less than the analytical detection limits at all five monitoring wells in 2025, consistent with historical results.

With one exception, the 2025 VOC concentrations were less than their respective Tier 1 Guidelines. VOC parameter 1,2-dichloroethene (cis) was detected at monitoring wells BH8 (0.0066 mg/L), MW-02 (0.0057 mg/L), and MW-03 (0.0024 mg/L). The concentration at BH8 showed a slight increase compared to previous years, while the concentration at MW-02 showed a slight decrease, 1,2-dichloroethene (cis) does not have an established Tier 1 Guideline.

Vinyl chloride was detected at monitoring well BH8 (0.0027 mg/L) in 2025, exceeding the Tier 1 Guideline of 0.0011 mg/L. This represents the first exceedance of vinyl chloride at the Site since 2021. Vinyl chloride is a known breakdown byproduct of the degradation of dry-cleaning liquids and also has been known to result from the breakdown of other industrial solvents used for adhesives and protective coatings. There had not been exceedances since 2021 in BH8; however, this recurrence of vinyl chloride above the Tier 1 Guideline may suggest a potential landfill leachate impact.

Both cis-1,2-dichloroethene and vinyl chloride are breakdown products of the solvents perchloroethylene/ tetratchloroethylene (PCE) and trichloroethylene (TCE), commonly used in dry cleaning and other industrial processes involving the cleaning and de-greasing of metals. Neither TCE nor PCE were detected in the on-site monitoring wells in previous years or in 2025. However, the laboratory detection limit for TCE has consistently been an order of magnitude higher than the Tier 1 Guideline of 0.00032 mg/L.

4.4 Quality Assurance/Quality Control

4.4.1 Methods

Tetra Tech's groundwater QA/QC procedures include reviewing the data collected for precision and accuracy and following the appropriate field protocols.

The field procedures for QA/QC involved:

- Changing nitrile gloves between sample collections;
- Using sample containers provided by the laboratory;
- Cleaning monitoring and sampling tools between sample locations;
- Filling sample containers for PHC and VOCs analysis with no headspace (air) when the containers were closed;
- Collecting a duplicate groundwater sample during the sampling event; and
- Documenting field procedures and sampling activities.

4.4.2 Results

The groundwater QA/QC results are included in Table 3. The duplicate sample was submitted for analysis of the same parameters as the original samples.

The duplicate analysis is compared by relative percent difference (RPD). The RPD is calculated using the following equation:

$$\text{RPD} = \left[\frac{(V_1 - V_2)}{\frac{(V_1 + V_2)}{2}}\right] * 100\%$$

Where:

V_1 = Parent Sample

V_2 = Duplicate Sample

Chemical parameters were considered as having passed the QA/QC reproducibility procedure if the RPD was less than or equal to 20%, indicating a close correlation between the sample-duplicate pair.

RPD values were not calculated if one or both of the sample-duplicate concentrations were between the reportable detection limit (RDL) and five times the RDL. In these cases, chemical parameters were still considered as having passed the QA/QC reproducibility procedure if the sample duplicate concentration difference was less than one RDL value.

For the groundwater duplicate sample collected in 2025 at monitoring well 22MW05 in October, RPDs were less than 20% for all of the reportable concentrations. Based on the QA/QC results, the sample methods and results are considered acceptable.

5.0 EVALUATION OF SITE CONDITIONS

5.1 Summary of Site Conditions

Based on the 2025 and historical data for the Site, there is no evidence that there are significant concerns related to the former landfill operations at the LTCHS impacting Gaetz Lake. However, there is evidence of residual impacts, and the Site does contain buried landfill waste; therefore, some risk management measures are required.

Historical assessments indicate that the eastern edges of the landfill are relatively close to Gaetz Lake (within 10 m to 20 m). Groundwater monitoring data in 2025 show the inferred groundwater flow direction at the Site is away from Gaetz Lake, flowing northwesterly towards the Red Deer River, which is consistent with historical results. In addition, datalogger information collected in 2023 from 22MW05 and from Gaetz Lake, included in Appendix E, show that Gaetz Lake is recharging the shallow groundwater in this location west of the lake.

The 2025 groundwater analytical results at MW-02, MW-03, 22MW05, and BH8 had similar concentrations to previous results and indicated a marginal presence of leachate indicator parameters.

Previous testing of well headspace vapours for methane and VOCs did not identify concerns at the locations monitored. In 2021 and 2022, the methane concentrations at all vapour probes were less than the instrument's detection limit and the highest methane concentration measured from the groundwater wells was 60 parts per million (ppm) at 22MW05. All measurements at the wells located next to the LTCHS were less than the instrument's detection limit. As there is little indication that measured concentrations pose a hazard to receptors, it was recommended that headspace vapour monitoring of the groundwater and vapour wells be discontinued. However, historical testing indicates the presence of LFG (characterized by methane concentrations at and greater than the explosive range of 5% to 15% by volume, where the Lower Explosive Limit [LEL] is equivalent to 50,000 ppm) in the landfill area.

An interceptor trench is present between the waste mass and the LTCHS and the LTCHS is required to provide periodic update of the program status to The City. Historical and current monitoring results suggest that the interceptor trench is performing as intended. Recent monitoring results reported by North Shore Environmental Consultants Inc. ([North Shore] 2025) show that methane concentrations measured in monitoring wells located on the LTCHS side of the interceptor trench have remained below applicable criteria. Historical vapour monitoring and analytical data is included in Appendix E.

As described in Appendix B, previous evaluation of the vapour data in regard to hazard quotients and cancer risk levels identified that no passive or active mitigative measures would be required for the Site with respect to vapours. As described above, there is no evidence of significant concerns relative to impact of Gaetz Lake by the historical landfill operations, and no mitigative measures are required.

6.0 CONCLUSIONS AND RECOMMENDATIONS

Based upon the results of the groundwater and soil vapour monitoring and sampling conducted in 2025 and previous years, Tetra Tech has developed the following conclusions:

- The groundwater elevations measured in October 2025 were used to infer a groundwater flow direction to the northwest, towards the Red Deer River. The average horizontal hydraulic gradient at the Site was approximately 0.002 m/m. The groundwater elevations decreased overall at all monitoring wells in 2025 compared to previous events, marking a change from the increasing or stable trend observed in recent years. Seasonal fluctuations have historically been observed at the monitoring wells, with spring elevations generally higher than the fall elevations.

- Based on a review of groundwater elevations from the monitoring well network and the 2023 datalogger recordings from Gaetz Lake and monitoring well 22MW05, immediately adjacent to Gaetz Lake (Tetra Tech 2024), Gaetz Lake appears to recharge the shallow groundwater west of the lake, with groundwater migrating toward the Red Deer River. The 2025 groundwater elevations agree with the previous assessment that groundwater within the footprint of the former landfill is migrating toward the Red Deer River rather than Gaetz Lake.

- Routine groundwater quality parameters and dissolved metals concentrations that exceeded the Tier 1 Guidelines at one or more monitoring wells in 2025 included TDS and the dissolved metals arsenic, iron, and manganese. The measured concentrations of these parameters show leachate indicator parameters and anoxic conditions at the Site. Notably, the dissolved iron concentration at 22MW05 has increased compared to previous years. Dissolved barium concentrations remain stable at the Site, previous guideline exceedances are no longer observed due to the 2023 increase of the Tier 1 Guideline value from 1.0 mg/L to 2.0 mg/L. Dissolved ammonia concentrations at MW-04 and BH8 have also increased compared to previous years, though they remained below Tier 1 Guidelines.

- Sulphate concentrations were non-detectable at wells 22MW05, MW-04, and MW-03 in 2025. Although this was previously attributed to sulphate reduction, the increasing dissolved iron levels suggest this is unlikely. Instead, the negligible sulphate concentrations likely reflect the natural low-sulphate composition of the local river gravels rather than leachate impact.

- Concentrations of BTEX were less than the analytical detection limits at all monitoring wells in 2025. In 2025, most VOC concentrations measured less than the analytical detection limits and less than the Tier 1 Guideline. Detectable concentrations of VOC parameter 1,2-dichloroethene (cis) were measured at monitoring wells BH8, MW-02, and MW-03. The concentration at BH8 showed a slight increase compared to previous years, while the concentration at MW-02 showed a slight decrease; this VOC does not have an established Tier 1 Guideline.

- Vinyl chloride was detected at monitoring well BH8 (0.0027 mg/L) in 2025, marginally exceeding the Tier 1 Guideline. This was the first detectable concentration of vinyl chloride at the Site since 2021. Vinyl chloride is a byproduct of the degradation solvents commonly used in dry-cleaning as well as other industrial uses such as cleaning and de-greasing metals. The marginal exceedance suggests a minor landfill leachate impact.

- Monitoring and/or analytical testing of the vapour probes was not conducted in 2025 based on previous results that suggest there is little indication that vapour migration poses a hazard to receptors. Historical testing indicates the presence of LFG (characterized by methane concentrations at and greater than the explosive range) in the landfill area; however, an interceptor trench is present between the waste mass and the LTCHS. Ongoing methane monitoring has been completed on behalf of the LTCHS, and recent results reported by North Shore (2025), included in Appendix E, suggest the interceptor trench is performing as intended, with methane concentrations measured on the LTCHS side of the interceptor trench remaining below applicable criteria.

- Overall, three of the five on-site monitoring wells showed minor/marginal concentrations of leachate indicator parameters in 2025.

Based upon the results of monitoring programs in 2025 and previous years, there are minor concentrations of leachate indicator parameters on-site; therefore, Tetra Tech recommends ongoing risk management, including ongoing monitoring and administrative actions. The following recommendations are made according to these risk management elements:

Ongoing Monitoring:

- Conduct a groundwater monitoring and sampling event in 2027 including monitoring wells MW-02, MW-03, MW-04, 22MW05, and BH8 to continue monitoring the groundwater flow pattern and groundwater quality, and to maintain an audit trail of environmental conditions. Further monitoring is not recommended at the monitoring wells located next to LTCHS (MW04A, MW05A, MW14A, and MW15A).

- Collect a groundwater sample from monitoring well BH8 in 2026 to confirm the presence of vinyl chloride and continue monitoring its concentration following the Tier 1 Guideline exceedance in 2025. The sample should be analyzed for the same parameters as previous samples—routine water chemistry, ammonia, dissolved metals, BTEX, PHCs, and VOCs. This work can be completed in conjunction with other monitoring programs in the area.

- Conduct an annual site walkover when there is no snow cover to monitor areas of thin cover and confirm the ground surface and vegetation cover remain intact. Maintaining the vegetation cover will help prevent soil exposure and mitigate the potential for waste exposure at the ground surface and will also limit rainfall infiltration and associated leachate generation. If areas of thin cover are observed, corrective action should be considered as appropriate.

Administrative Actions:

- The interceptor trench adjacent to the LTCHS is operated and monitored by the LTCHS and we understand that the LTCHS provides periodic updates of the program status to The City. Based on historical and recent monitoring results, the interceptor trench appears to be performing as intended. Annual monitoring and reporting should continue to confirm the interceptor trench is operating properly and to support ongoing management activities at this Site. We recommend that The City obtain and review the collected monitoring data on an annual basis.

- Utilize the revised generic mitigative measures, described in Appendix B, when evaluating applications for development within the setback.

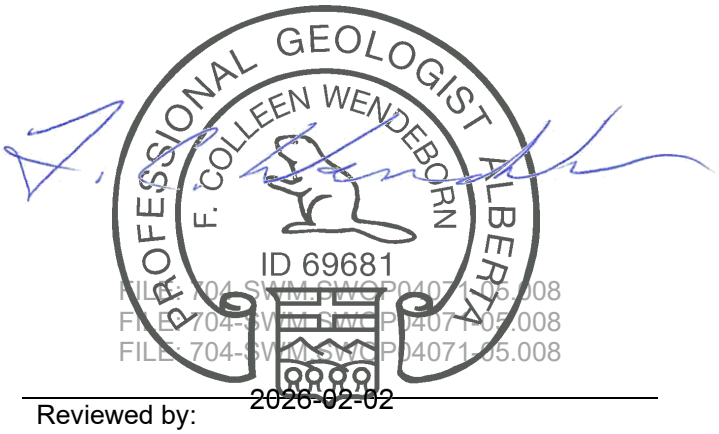
- Ensure that the Site is clearly identified within The City's Land Use Bylaw and appropriate administrative requirements are met for the Site in accordance with City policies.

Further to the above recommendations, as noted, the Site remains an historical landfill. It presently appears to be well maintained and capped. The City should review this status on an ongoing basis to ensure that the cover remains intact, and drainage remains positive; repairs or maintenance should be undertaken as required to maintain the Site. We note that the design and operation of the interceptor trench adjacent to the LTCHS was developed based on surface conditions similar to existing, and if changes or improvements to the surface of the landfill are contemplated (e.g., paving or installation of an impermeable cap), such work should be undertaken in conjunction with a review of the interceptor trench design and performance.

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.



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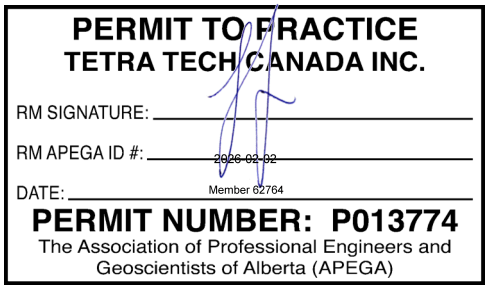

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TABLES

Table 1: Groundwater Elevations

Monitoring Well		MW-01	MW-02	MW-03	MW-04	22MW05	BH8	MW04A	MW05A	MW14A	MW15A	Gaetz Lake
Total Drilled Depth (m)		6.1	6.1	4.6	4.6	4.5	6.0	6.0	6.0	-	-	-
Top of Screened Interval (mbg)		1.5	3.1	1.6	1.6	1.5	3.0	4.5	4.5	-	-	-
Bottom of Screened Interval (mbg)		6.1	6.1	4.6	4.6	4.5	6.0	6.0	6.0	-	-	-
Stick up (m)		0.02	0.80	0.79	0.85	1.06	0.91	-0.24	-0.10	-0.11	-0.11	-
Ground Elevation (m)		853.77	853.86	853.58	852.10	850.88	853.39	854.76	854.71	854.53	854.29	-
TPC Elevation (m)		853.79	854.66	854.36	852.95	851.94	854.30	854.65	854.96	854.42	854.26	853.52
Depth to Groundwater (mBTPC)	Aug-13	3.04	3.03	3.54	1.61	-	-	3.60	3.70	3.60	3.40	-
	May-19	CNL	4.07	4.48	2.52	-	-	-	-	-	-	-
	Jun-19	CNL	3.99	4.48	2.46	-	-	-	-	-	-	-
	Sep-19	CNL	4.04	4.60	2.74	-	-	-	-	-	-	-
	Dec-19	CNL	4.12	4.65	2.78	-	-	-	-	-	-	-
	Nov-21	CNL	4.15	4.69	2.84	-	3.70	Dry	Dry	Frozen	Dry	-
	Feb-22	CNL	4.26	4.76	2.97	2.91	3.76	Frozen	-	-	Dry	-
	Jun-22	CNL	4.11	4.65	2.56	1.28	3.95	Dry	Dry	Dry	Dry	2.81
	May-23	CNL	3.99	4.56	2.64	1.21	3.44	-	-	-	-	2.65
	Nov-23	CNL	4.09	4.67	2.77	1.35	3.57	-	-	-	-	2.79
	Oct-25	-	4.48	4.92	3.20	2.00	4.06	-	-	-	-	-
Groundwater Elevation (m)	Aug-13	850.75	851.63	850.82	851.35	-	-	850.91	850.91	850.81	850.78	-
	May-19	Destroyed	850.60	849.88	850.43	-	-	-	-	-	-	-
	Jun-19	Destroyed	850.68	849.88	850.49	-	-	-	-	-	-	-
	Sep-19	Destroyed	850.62	849.77	850.21	-	-	-	-	-	-	-
	Dec-19	Destroyed	850.55	849.71	850.17	-	-	-	-	-	-	-
	Nov-21	Destroyed	850.52	849.67	850.11	-	850.60	Dry	Dry	Frozen	Dry	-
	Feb-22	Destroyed	850.40	849.60	849.98	849.03	850.54	Frozen	-	-	Dry	-
	Jun-22	Destroyed	850.55	849.71	850.39	850.66	850.35	Dry	Dry	Dry	Dry	850.71
	May-23	Destroyed	850.67	849.80	850.31	850.73	850.86	-	-	-	-	850.87
	Nov-23	Destroyed	850.57	849.69	850.19	850.60	850.73	-	-	-	-	850.73
	Oct-25	Destroyed	850.18	849.44	849.75	849.94	850.24	-	-	-	-	-
Combustible Vapour Concentrations* (CVCs) (ppm)	Aug-13	100	ND	ND	ND	N/A	N/A	140	200	250	260	N/A
	May-19	Destroyed	ND	ND	ND	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Jun-19	Destroyed	ND	ND	ND	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Sep-19	Destroyed	ND	5	150	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Dec-19	Destroyed	ND	ND	35	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Volatile Organic Compounds* (VOCs) (ppm)	Aug-13	ND	ND	ND	ND	N/A	N/A	ND	ND	ND	ND	N/A
	May-19	Destroyed	ND	ND	ND	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Jun-19	Destroyed	ND	ND	ND	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Sep-19	Destroyed	ND	ND	ND	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Dec-19	Destroyed	ND	ND	ND	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Methane Concentrations (ppm)**	Nov-21	Destroyed	ND	ND	ND	N/A	ND	ND	ND	ND	ND	NA
	Feb-22	Destroyed	ND	ND	ND	ND	ND	ND	N/A	N/A	ND	NA
	Jun-22	Destroyed	ND	ND	ND	60	ND	ND	ND	ND	ND	NA

Notes:

mbg - Metres below grade.

mBTPC - Metres below top of plastic pipe casing.

ND - Non-detect

*- Measured using RKI Eagle II calibrated to hexane and isobutylene and operated in methane elimination mode.

**- Measured using RKI Eagle II calibrated to methane.

CNL - Could not locate.

N/A - Not applicable; prior to well installation.

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Table 2: Groundwater Analytical Results

Parameter	Unit	Tier 1 Guideline [1,2]	MW-01	MW 02				MW 03			MW 04				
			15-Aug-13	15-Aug-13	5-Dec-2019	21-Nov-2021	16 Oct 2025	5-Dec-2019	21-Nov-2021	16 Oct 2025	15-Aug-13	5-Dec-2019	21-Nov-2021	21 Nov 2021 (Duplicate)	16 Oct 2025
Field Testing															
Field pH	pH Units	6.5 to 8.5	-	-	8.28	6.90	7.31	7.73	6.72	7.18	-	**8.55**	7.50	-	7.34
Field Electric Conductivity	µS/cm	-	-	-	666	1,010	1,146	510	818	983	-	490	813	-	930
Field Temperature	°C	-	-	-	3.94	6.01	8.81	1.08	6.64	10.32	-	4.23	6.33	-	11.53
Routine															
pH	pH Units	6.5 to 8.5	7.45	7.44	7.86	7.87	7.63	8	7.77	7.62	7.52	8.05	7.87	7.94	7.75
Electrical Conductivity (EC)	µS/cm	-	1,400	1,100	1,040	1,110	1,140	876	866	946	950	710	834	829	961
Total Dissolved Solids (TDS)	mg/L	500	-	-	**644**	**691**	**673**	**522**	**546**	**599**	-	423	**524**	**519**	**568**
Hardness as $CaCO_3$	mg/L	-	-	-	515	508	485	416	389	434	-	333	378	369	397
Alkalinity (total as $CaCO_3$)	mg/L	-	490	420	431	446	440	502	473	504	490	396	488	483	512
Bicarbonate	mg/L	-	600	510	526	544	537	612	577	615	590	483	596	589	625
Carbonate	mg/L	-	<0.50	<0.50	<5.0	<1	<0.6	<5.0	<1	<0.6	<0.50	<5.0	<1	<1	<0.6
Hydroxide	mg/L	-	<0.50	<0.50	<5.0	-	<0.3	<5.0	-	<0.3	<0.50	<5.0	-	-	<0.3
Calcium	mg/L	-	170	330	134	129	122	102	94.6	106	110	80.2	95.9	92.5	99
Magnesium	mg/L	-	64	93	43.8	45.1	43.9	39.2	37.2	41.0	38.0	32.2	33.6	33.6	36.4
Potassium	mg/L	-	3.9	5.1	4.64	4.77	4.62	5.88	6.00	6.32	4.2	3.54	3.59	3.58	4.07
Sodium	mg/L	200	48	790	40.7	49.2	46.2	48.2	54.7	56.7	53.0	48	56.2	56.2	57.3
Chloride	mg/L	120	110	72	91.5	98.4	93.3	25.2	30.0	38.4	33.0	15.2	18.5	19.6	40.2
Fluoride	mg/L	1.5	-	-	<0.10	0.16	0.162	0.103	0.246	0.208	-	0.126	0.23	0.229	0.284
Sulphate	mg/L	429 [3]	96	84	70.4	71.4	73.8	<0.30	<1.5	<1.50	4.7	5.6	1.36	1.71	<1.50
Anions Total	meq/L	-	-	-	-	-	13.0	-	-	11.2	-	-	-	-	11.4
Cations Total	meq/L	-	-	-	-	-	12.1	-	-	12.2	-	-	-	-	10.7
Cation - Anion Balance	%	-	-	-	-	-	-3.59	-	-	4.27	-	-	-	-	-3.17
Ionic Balance	N/A	-	-	-	96.5	101	93	99.2	99.3	109	-	104	100	100	94
Nutrients															
Ammonia as N	mg/L	3.43 to 9.02 [6]	0.18	1.6	0.690	0.684	0.602	1.31	0.96	0.932	0.64	0.213	0.204	0.257	0.465
Nitrate (as NO_3-N)	mg/L	3	4.8	0.99	<0.10	<0.10	<0.100	<0.020	<0.10	<0.100	0.066	0.022	<0.020	<0.10	<0.100
Nitrite (as NO_2-N)	mg/L	0.20 [4]	0.91	<0.0030	<0.050	<0.050	<0.050	<0.010	<0.050	<0.050	<0.0030	<0.010	<0.010	<0.050	<0.050
Nitrate and Nitrite (as N)	mg/L	-	5.7	0.99	<0.11	-	<0.112	<0.022	-	<0.112	0.066	<0.022	-	-	<0.112
Total Kjeldahl Nitrogen (TKN)	mg/L	-	8.9	10	1.30	-	-	35.0	-	-	16.0	3.0	-	-	-
Carbon															
Dissolved Organic Carbon (DOC)	mg/L	-	-	-	4.8	-	-	15.1	-	-	-	10.1	-	-	-
Dissolved Metals															
Aluminum	mg/L	0.050 [5]	0.011	1.8	0.0076	0.0024	<0.0010	0.0212	0.0154	**1.37**	**0.0034**	**0.162**	<0.0010	<0.0010	0.0012
Antimony	mg/L	0.006	<0.0006	<0.0006	<0.00050	<0.00010	<0.00010	0.00014	0.00018	<0.00010	<0.0006	<0.0001	<0.00010	<0.00010	0.00011
Arsenic	mg/L	0.005	0.001	0.017	**0.00759**	**0.00959**	**0.0097**	**0.0320**	**0.0333**	**0.0343**	**0.0086**	**0.00832**	**0.0107**	**0.0105**	**0.0136**
Barium	mg/L	2	0.36	0.055	0.547	0.53	0.515	1.80	1.85	1.91	0.9	0.752	0.777	0.77	0.933
Beryllium	mg/L	-	<0.0010	<0.0010	-	<0.000020	-	-	<0.000020	-	<0.0010	-	<0.000020	<0.000020	-
Bismuth	mg/L	-	-	-	-	<0.000050	-	-	<0.000050	-	-	-	<0.000050	<0.000050	-
Boron	mg/L	1.5	<0.020	<0.020	<0.050	0.046	0.047	0.055	0.055	0.067	0.021	0.029	0.036	0.035	0.049
Cadmium	mg/L	0.00037 [3]	0.041	2.3	0.000045	0.0000168	0.0000128	0.0000821	0.0000136	0.000232	0.018	**0.000403**	0.0000114	0.0000103	0.0000123
Chromium	mg/L	0.05	<0.0010	0.0038	<0.00050	<0.00050	<0.00050	0.00015	<0.00050	0.00249	<0.0010	0.00024	<0.00050	<0.00050	<0.00050
Cobalt	mg/L	0.0018 [3]	0.0041	0.027	-	0.00043	-	-	0.00084	-	0.0033	-	**0.00257**	**0.00255**	-
Copper	mg/L	0.007	0.0024	0.027	<0.0010	<0.00020	<0.00020	0.00135	0.00093	0.00626	0.001	0.00233	0.0007	<0.00020	0.0005
Iron	mg/L	0.3	<0.060	29	**6.89**	**7.67**	**6.99**	**14.8**	**17.2**	**18.7**	**1.2**	**2.94**	**4.00**	**3.91**	**3.69**
Lead	mg/L	0.007 [3]	<0.00020	0.0037	<0.00025	<0.000050	<0.000050	0.00011	0.000061	0.00587	<0.00020	0.000355	<0.000050	<0.000050	<0.000050
Lithium	mg/L	-	0.026	0.03	-	0.0275	-	-	0.0196	-	<0.020	-	0.0146	0.0138	-
Manganese	mg/L	0.02	1.3	45	**0.528**	**0.490**	**0.455**	**0.412**	**0.437**	**0.549**	**1.1**	**0.805**	**0.865**	**0.869**	**0.963**
Mercury	mg/L	0.000005	-	-	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	-	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Molybdenum	mg/L	-	0.0019	0.0011	-	0.00303	-	-	0.00753	-	0.0037	-	0.00346	0.0033	-
Nickel	mg/L	0.17 [3]	0.0079	0.052	<0.0025	0.0017	0.00169	0.00142	0.00132	0.00546	0.0046	0.00333	0.00271	0.00265	0.00244
Phosphorus	mg/L	-	<0.10	0.68	0.524	<0.05	-	21.5	<0.05	-	<0.10	3.15	<0.05	<0.05	-
Selenium	mg/L	0.002	0.00071	0.00045	<0.00025	<0.000050	<0.000050	0.000131	0.000138	0.000157	<0.00020	0.000138	0.000138	0.000167	0.000194
Silicon	mg/L	-	5.8	9.2	-	6.18	-	-	7.8	-	6.5	-	6.26	6.13	-
Silver	mg/L	0.0001	<0.00010	<0.00010	<0.000050	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00010	<0.000010	<0.000010	<0.000010	<0.000010
Strontium	mg/L	-	0.8	0.87	-	0.719	-	-	0.614	-	0.7	-	0.651	0.619	-
Sulphur	mg/L	-	30	970	-	25.9	-	-	<0.50	-	1.6	-	0.52	0.52	-
Thallium	mg/L	-	<0.00020	0.00026	-	<0.000010	-	-	<0.000010	-	<0.00020	-	0.000012	0.000013	-
Tin	mg/L	-	<0.0010	<0.0010	-	<0.00010	-	-	<0.00010	-	<0.0010	-	<0.00010	<0.00010	-
Titanium	mg/L	-	<0.0010	0.0035	-	<0.00030	-	-	0.00041	-	<0.0010	-	<0.00030	<0.00030	-
Uranium	mg/L	0.015	0.0048	0.002	0.00295	0.00294	0.00292	0.000291	0.000266	0.000648	0.0021	0.0013	0.00179	0.00176	0.0014
Vanadium	mg/L	-	<0.0010	0.0098	-	<0.00050	-	-	<0.00050	-	<0.0010	-	<0.00050	<0.00050	-
Zinc	mg/L	0.03	0.003	0.086	<0.0050	0.0025	0.001	0.0026	0.0042	0.0212	0.0037	0.0036	0.0029	0.0018	<0.0010
Zirconium	mg/L	-	-	-	-	<0.00020	-	-	0.00073	-	-	-	0.00027	0.00027	-
Organics															
AOX	mg/L	-	0.05	-	<10	-	-	<10	-	-	0.09	<10	-	-	-
Hydrocarbons															
Benzene	mg/L	0.005	<0.00040	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00040	<0.00050	<0.00050	<0.00050	<0.00050
Toluene	mg/L	0.021	<0.00040	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00040	<0.00050	<0.00050	<0.00050	<0.00050
Ethylbenzene	mg/L	0.0016	<0.00040	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00040	<0.00050	<0.00050	<0.00050	<0.00050
Xylene (o)	mg/L	-	<0.00040	-	<0.00050	<0.00030	<0.00030	<0.00050	<0.00030	<0.00030	<0.00040	<0.00050	<0.00030	<0.00030	<0.00030
Xylenes (m & p)	mg/L	-	<0.00080	-	<0.00050	<0.00040	<0.00040	<0.00050	<0.00040	<0.00040	<0.00080	<0.00050	<0.00040	<0.00040	<0.00040
Xylenes Total	mg/L	0.02	<0.00080	-	<0.00071	<0.00050	<0.00050	<0.00071	<0.00050	<0.00050	<0.00080	<0.00071	<0.00050	<0.00050	<0.00050
Styrene	mg/L	0.072	<0.00050	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
F1 (C_6-C_{10})	mg/L	-	<0.10	-	<0.10	-	-	<0.10	-	-	<0.10	<0.10	-	-	-
F1 (C_6-C_{10}) - BTEX	mg/L	0.81	-	-	<0.10	-	-	<0.10	-	-	-	<0.10	-	-	-
F2 (C_{10}-C_{16})	mg/L	1.1	<0.10	<0.10	<0.10	-	-	<0.10	-	-	<0.10	<0.10	-	-	-
Total BTEX	mg/L	-	-	-	-	<0.0010	<0.0010	-	<0.0010	<0.0010	-	-	<0.0010	<0.0010	<0.0010

Notes:

[1] Alberta Environment and Protected Areas (Alberta EPA). 2024. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. Referenced guidelines are for coarse-textured soils under Residential/Parkland 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 (FAL). Most conservative values applied (chronic or acute).

[3] Guideline varies with hardness. Values shown based on site hardness range of 386 mg/L to 640 mg/L (October, 2025).

[4] Guideline varies with chloride. Values shown based on site chloride range of 38.4 mg/L to 640 mg/L (October, 2025)

[5] Guideline varies with pH. Values shown based on site pH range of 7.00 to 7.34 (October, 2025).

[6] Guideline varies with pH and temperature. Values shown based on pH range of 7.00 to 7.34 and temperature range of 8.81°C to 11.53°C (October, 2025).

"-" No applicable guideline.

BOLD - Greater than Tier 1 Guideline.

N/A - Not applicable.

Analytical detection limit is greater than the guideline.

TETRA TECH

Table 2: Groundwater Analytical Results

Parameter	Unit	Tier 1 Guideline [1,2]	MW-01	MW 02				MW 03			MW 04				
			15-Aug-13	15-Aug-13	5-Dec-2019	21-Nov-2021	16 Oct 2025	5-Dec-2019	21-Nov-2021	16 Oct 2025	15-Aug-13	5-Dec-2019	21-Nov-2021	21 Nov 2021 (Duplicate)	16 Oct 2025
Polycyclic Aromatic Hydrocarbons (PAHs)															
Naphthalene	mg/L	0.001	-	-	-	<0.0010	-	-	<0.0010	-	-	-	<0.0010	<0.0010	-
Volatile Fatty/Carboxylic Acids															
Acetic Acid	mg/L	-	<50	-	<10	-	-	<10	-	-	<50	<10	-	-	-
Butyric Acid	mg/L	-	-	-	<1.0	-	-	<1.0	-	-	-	<1.0	-	-	-
Formic Acid	mg/L	-	<50	-	<50	-	-	<50	-	-	<50	<50	-	-	-
Hexanoic Acid	mg/L	-	-	-	<1.0	-	-	<1.0	-	-	-	<1.0	-	-	-
iso-Butyric Acid	mg/L	-	-	-	<1.0	-	-	<1.0	-	-	-	<1.0	-	-	-
Isovaleric acid	mg/L	-	-	-	<1.0	-	-	<1.0	-	-	-	<1.0	-	-	-
Proponic Acid	mg/L	-	<50	-	<5	-	-	<5	-	-	<50	<5	-	-	-
Valeric Acid	mg/L	-	-	-	<1.0	-	-	<1.0	-	-	-	<1.0	-	-	-
Volatile Organic Compounds (VOCs)															
Bromobenzene	mg/L	-	-	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010
Bromochloromethane	mg/L	-	-	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010
Bromodichloromethane	mg/L	-	<0.00050	-	<0.00050	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.0010	<0.0010	<0.0010
Bromoform	mg/L	-	<0.00050	-	<0.00050	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.0010	<0.0010	<0.0010
Bromomethane	mg/L	-	<0.0020	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010	<0.0010
n-Butylbenzene	mg/L	-	-	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010
sec-Butylbenzene	mg/L	-	-	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010
tert-Butylbenzene	mg/L	-	-	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010
Carbon tetrachloride	mg/L	0.0015	<0.00050	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Chlorobenzene	mg/L	0.0013	<0.00050	-	<0.00050	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.0010	<0.0010	<0.0010
Chloroethane	mg/L	-	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Chloroform	mg/L	0.018	<0.00050	-	<0.00050	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.0010	<0.0010	<0.0010
Chloromethane	mg/L	-	<0.0020	-	<0.0010	<0.0050	<0.0050	<0.0010	<0.0050	<0.0050	<0.0020	<0.0010	<0.0050	<0.0050	<0.0050
2-Chlorotoluene	mg/L	-	-	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010
4-Chlorotoluene	mg/L	-	-	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010
Dibromochloromethane	mg/L	0.19	<0.0010	-	<0.00050	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010
1,2-Dibromo-3-chloropropane	mg/L	-	-	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010
1,2-Dibromoethane	mg/L	-	-	-	<0.00050	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	-	<0.00050	<0.0010	<0.0010	<0.0010
Dibromomethane	mg/L	-	-	-	<0.00050	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	-	<0.00050	<0.0010	<0.0010	<0.0010
1,2-Dichlorobenzene	mg/L	0.0007	<0.00050	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
1,3-Dichlorobenzene	mg/L	-	<0.00050	-	<0.00050	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.0010	<0.0010	<0.0010
1,4-Dichlorobenzene	mg/L	0.001	<0.00050	-	<0.00050	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.0010	<0.0010	<0.0010
1,1-Dichloroethane	mg/L	-	<0.00050	-	<0.00050	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.0010	<0.0010	<0.0010
1,2-Dichloroethane	mg/L	0.005	<0.00050	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010
1,1-Dichloroethene	mg/L	0.014	<0.00050	-	<0.00050	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.0010	<0.0010	<0.0010
1,2-Dichloroethene (cis)	mg/L	-	<0.00050	-	0.0084	0.0075	0.0057	0.0019	0.0019	0.0024	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010
1,2-Dichloroethene (trans)	mg/L	-	<0.00050	-	0.00067	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.0010	<0.0010	<0.0010
Dichlorodifluoromethane	mg/L	-	-	-	<0.00050	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	-	<0.00050	<0.0010	<0.0010	<0.0010
1,2-Dichloropropane	mg/L	-	<0.00050	-	<0.00050	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.0010	<0.0010	<0.0010
1,3-Dichloropropane	mg/L	-	-	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010
2,2-Dichloropropane	mg/L	-	-	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010
1,1-Dichloropropene	mg/L	-	-	-	<0.0010	<0.0010	<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
1,3-Dichloropropene [cis]	mg/L	-	<0.00050	-	<0.00050	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.0010	<0.0010	<0.0010
1,3-Dichloropropene [trans]	mg/L	-	<0.00050	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010
Hexachlorobutadiene	mg/L	0.0013	-	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010
p-Isopropyltoluene	mg/L	-	-	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010
Methyl t-Butyl Ether (MTBE)	mg/L	0.015	<0.00050	-	-	<0.00050	<0.00050	-	<0.00050	<0.00050	<0.00050	-	<0.00050	<0.00050	<0.00050
Methylene Chloride	mg/L	0.05	<0.0020	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010	<0.0010
iso-Propylbenzene (cumene)	mg/L	-	-	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010
n-Propylbenzene	mg/L	-	-	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010
1,1,1,2-Tetrachloroethane	mg/L	-	<0.0020	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010	<0.0010
1,1,2,2-Tetrachloroethane	mg/L	-	<0.0020	-	<0.00050	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0020	<0.00050	<0.0010	<0.0010	<0.0010
Tetrachloroethene (PCE)	mg/L	0.01	<0.00050	-	<0.00050	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.0010	<0.0010	<0.0010
1,2,3-Trichlorobenzene	mg/L	0.008	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
1,2,4-Trichlorobenzene	mg/L	0.015	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
1,1,1-Trichloroethane	mg/L	-	<0.00050	-	<0.00050	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.0010	<0.0010	<0.0010
1,1,2-Trichloroethane	mg/L	-	<0.00050	-	<0.00050	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.0010	<0.0010	<0.0010
Trichloroethene	mg/L	0.00032	<0.00050	-	<0.00050	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.0010	<0.0010	<0.0010
Trichlorofluoromethane	mg/L	-	<0.00050	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010
Trihalomethanes	mg/L	0.1	<0.0020	-	-	<0.0020	<0.0020	-	<0.0020	<0.0020	<0.0020	-	<0.0020	<0.0020	<0.0020
1,2,3-Trichloropropane	mg/L	-	-	-	<0.00050	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	-	<0.00050	<0.0010	<0.0010	<0.0010
1,2,4-Trimethylbenzene	mg/L	-	<0.00050	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010
1,3,5-Trimethylbenzene	mg/L	-	<0.00050	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010
Vinyl chloride	mg/L	0.0011	<0.00050	-	<0.00050	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.0010	<0.0010	<0.0010

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[4] Guideline varies with chloride. Values shown based on site chloride range of 38.4 mg/L to 640 mg/L (October, 2025)

[5] Guideline varies with pH. Values shown based on site pH range of 7.00 to 7.34 (October, 2025).

[6] Guideline varies with pH and temperature. Values shown based on pH range of 7.00 to 7.34 and temperature range of 8.81°C to 11.53°C (October, 2025).

"-" No applicable guideline or no analyzed concentration.

BOLD - Greater than Tier 1 Guideline.

N/A - Not applicable.

Analytical detection limit is greater than the guideline.

TETRA TECH

Table 2: Groundwater Analytical Results

Parameter	Unit	Tier 1 Guideline [1,2]	BH8					22MW05					
			21-Nov-2021	31-May-2023	31 May 2023 (Duplicate)	8-Nov-2023	16 Oct 2025	1-Feb-2022	31-May-2023	8-Nov-2023	08 Nov 2023 (Duplicate)	16 Oct 2025	16 Oct 2025 (Duplicate)
Field Testing													
Field pH	pH Units	6.5 to 8.5	6.63	7.23	-	7.17	7	7.51	7.17	7.09	-	7.11	7.11
Field Electric Conductivity	µS/cm	-	1,181	1,376	-	1,422	1,342	1035	1,208	1,116	-	1,148	1,148
Field Temperature	°C	-	5.4	5.2	-	6.0	9.1	3.2	7.8	6.1	-	9.2	9.2
Routine													
pH	pH Units	6.5 to 8.5	7.73	7.60	7.71	7.60	7.52	7.19	7.65	7.48	7.47	7.45	7.43
Electrical Conductivity (EC)	µS/cm	-	1,380	1,330	1,320	1,330	1310	1030	1,160	1,040	1,060	1060	1060
Total Dissolved Solids (TDS)	mg/L	500	**876**	**879**	**846**	**877**	**814**	**684**	**742**	**670**	**672**	**663**	**652**
Hardness as $CaCO_3$	mg/L	-	686	762	749	725	640	452	467	417	420	386	386
Alkalinity (total as $CaCO_3$)	mg/L	-	672	625	580	648	620	580	620	554	556	538	520
Bicarbonate	mg/L	-	820	762	708	790	756	708	757	676	679	656	634
Carbonate	mg/L	-	<1	<1.0	<1.0	<1.0	<0.6	<1.0	<1.0	<1.0	<1.0	<0.6	<0.6
Hydroxide	mg/L	-		<1.0	<1.0	<1.0	<0.3	<1.0	<1.0	<1.0	<1.0	<0.3	<0.3
Calcium	mg/L	-	178	194	190	184	163	102	110	94.6	95.8	89.1	89.1
Magnesium	mg/L	-	58.7	67.5	66.6	64.6	56.5	47.9	46.8	44.0	43.9	39.8	39.7
Potassium	mg/L	-	3.97	3.68	3.59	4.08	4.82	8.54	7.57	7.91	8.00	6.5	6.79
Sodium	mg/L	200	58.7	60.0	58.4	59.7	49.8	65.3	108	87.6	87.4	77	76.6
Chloride	mg/L	120	70.2	63.4	63.4	70.8	52.2	45.0	46.0	48.7	48.7	60.0	60.5
Fluoride	mg/L	1.5	0.153	0.105	0.102	0.151	0.148	0.132	0.249	0.262	0.252	0.267	0.268
Sulphate	mg/L	429 [3]	81.7	96.9	97.1	85.5	92.3	7.1	2.15	1.67	1.67	<1.50	<1.50
Anions Total	meq/L	-	-	-	-	-	15.8	-	-	-	-	12.5	12.1
Cations Total	meq/L	-	-	-	-	-	15.2	-	-	-	-	12.4	12.3
Cation - Anion Balance	%	-	-	-	-	-	-1.94	-	-	-	-	-0.4	0.82
Ionic Balance	N/A	-	101	110	114	104	96	100	108	104	105	99	102
Nutrients													
Ammonia as N	mg/L	3.43 to 9.02 [6]	0.589	0.223	0.220	0.258	0.678	3.66	2.72	3.16	3.25	3.38	2.98
Nitrate (as NO_3-N)	mg/L	3	<0.10	0.129	0.120	0.032	<0.100	0.170	0.037	0.028	0.027	<0.100	<0.100
Nitrite (as NO_2-N)	mg/L	0.20 [4]	<0.050	<0.010	<0.010	<0.010	<0.050	<0.050	<0.010	<0.010	<0.010	<0.050	<0.050
Nitrate and Nitrite (as N)	mg/L	-	-	0.129	0.120	0.0320	<0.112	0.170	0.0370	0.0280	0.0270	<0.112	<0.112
Total Kjeldahl Nitrogen (TKN)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-
Carbon													
Dissolved Organic Carbon (DOC)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-
Dissolved Metals													
Aluminum	mg/L	0.050 [5]	0.0055	0.0022	0.0016	<0.0010	<0.0010	0.0032	0.0037	0.0228	0.0182	0.0018	0.0019
Antimony	mg/L	0.006	<0.00050	0.00014	0.00013	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Arsenic	mg/L	0.005	0.0016	0.00083	0.00076	0.00089	0.00178	**0.0275**	**0.00593**	**0.0102**	**0.0104**	**0.0193**	**0.0197**
Barium	mg/L	2	0.57	0.572	0.580	0.591	0.537	1.25	0.742	0.738	0.746	0.816	0.811
Beryllium	mg/L	-	<0.00010	-	-	-	-	-	-	-	-	-	-
Bismuth	mg/L	-	<0.00025	-	-	-	-	-	-	-	-	-	-
Boron	mg/L	1.5	0.059	0.059	0.057	0.068	0.093	0.064	0.078	0.086	0.084	0.085	0.085
Cadmium	mg/L	0.00037 [3]	0.0000634	0.0000557	0.0000548	0.0000511	0.0000549	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Chromium	mg/L	0.05	<0.0025	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Cobalt	mg/L	0.0018 [3]	0.00357	-	-	-	-	-	-	-	-	-	-
Copper	mg/L	0.007	<0.0010	0.00080	0.00068	0.00066	0.0005	0.00042	0.00029	0.00028	0.00024	<0.00020	<0.00020
Iron	mg/L	0.3	**1.07**	0.166	0.162	0.208	**0.654**	**16.1**	**8.45**	**11.0**	**11.0**	**24**	**23.8**
Lead	mg/L	0.007 [3]	<0.00025	<0.000050	<0.000050	<0.000050	<0.000050	0.000051	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Lithium	mg/L	-	0.0194	-	-	-	-	-	-	-	-	-	-
Manganese	mg/L	0.02	**1.52**	**0.965**	**0.943**	**1.34**	**1.61**	**0.509**	**1.66**	**1.62**	**1.63**	**1.68**	**1.69**
Mercury	mg/L	0.000005	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	**0.0000072**	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Molybdenum	mg/L	-	0.00123	-	-	-	-	-	-	-	-	-	-
Nickel	mg/L	0.17 [3]	0.0048	0.00368	0.00365	0.00431	0.00466	0.00081	0.00114	0.00098	0.00103	0.00086	0.00081
Phosphorus	mg/L	-	<0.25	-	-	-	-	-	-	-	-	-	-
Selenium	mg/L	0.002	<0.00025	0.00105	0.000976	0.000164	0.000104	0.000174	0.000143	0.000114	0.000162	0.000146	0.000142
Silicon	mg/L	-	6.47	-	-	-	-	-	-	-	-	-	-
Silver	mg/L	0.0001	<0.000050	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Strontium	mg/L	-	0.694	-	-	-	-	-	-	-	-	-	-
Sulphur	mg/L	-	29.8	-	-	-	-	-	-	-	-	-	-
Thallium	mg/L	-	<0.000050	-	-	-	-	-	-	-	-	-	-
Tin	mg/L	-	<0.00050	-	-	-	-	-	-	-	-	-	-
Titanium	mg/L	-	<0.0015	-	-	-	-	-	-	-	-	-	-
Uranium	mg/L	0.015	0.00705	0.00784	0.00794	0.00656	0.00553	0.000605	0.000787	0.000460	0.000438	0.000358	0.000346
Vanadium	mg/L	-	<0.0025	-	-	-	-	-	-	-	-	-	-
Zinc	mg/L	0.03	<0.0050	0.0013	<0.0010	0.0014	0.0013	0.0039	<0.0010	0.0011	<0.0010	<0.0010	<0.0010
Zirconium	mg/L	-	<0.0010	-	-	-	-	-	-	-	-	-	-
Organics													
AOX	mg/L	-	-	-	-	-	-	-	-	-	-	-	-
Hydrocarbons													
Benzene	mg/L	0.005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Toluene	mg/L	0.021	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Ethylbenzene	mg/L	0.0016	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Xylene (o)	mg/L	-	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Xylenes (m & p)	mg/L	-	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylenes Total	mg/L	0.02	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Styrene	mg/L	0.072	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
F1 (C_6-C_{10})	mg/L	-	-	-	-	-	-	-	-	-	-	-	-
F1 (C_6-C_{10}) - BTEX	mg/L	0.81	-	-	-	-	-	-	-	-	-	-	-
F2 (C_{10}-C_{16})	mg/L	1.1	-	-	-	-	-	-	-	-	-	-	-
Total BTEX	mg/L	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010

Notes:

[1] Alberta Environment and Protected Areas (Alberta EPA). 2024. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. Referenced guidelines are for coarse-textured soils

[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 (FAL). Most conservative values applied (chronic or acute).

[3] Guideline varies with hardness. Values shown based on site hardness range of 386 mg/L to 640 mg/L (October, 2025).

[4] Guideline varies with chloride. Values shown based on site chloride range of 38.4 mg/L to 640 mg/L (October, 2025)

[5] Guideline varies with pH. Values shown based on site pH range of 7.00 to 7.34 (October, 2025).

[6] Guideline varies with pH and temperature. Values shown based on pH range of 7.00 to 7.34 and temperature range of 8.81°C to 11.53°C (October, 2025).

"-" No applicable guideline.

BOLD - Greater than Tier 1 Guideline.

N/A - Not applicable.

Analytical detection limit is greater than the guideline.

TETRA TECH

Table 2: Groundwater Analytical Results

Parameter	Unit	Tier 1 Guideline [1,2]	BH8					22MW05					
			21-Nov-2021	31-May-2023	31 May 2023 (Duplicate)	8-Nov-2023	16 Oct 2025	1-Feb-2022	31-May-2023	8-Nov-2023	08 Nov 2023 (Duplicate)	16 Oct 2025	16 Oct 2025 (Duplicate)
Polycyclic Aromatic Hydrocarbons (PAHs)													
Naphthalene	mg/L	0.001	<0.0010	-	-	-	-	<0.0010	-	-	-	-	-
Volatile Fatty/Carboxylic Acids													
Acetic Acid	mg/L	-	-	-	-	-	-	-	-	-	-	-	-
Butyric Acid	mg/L	-	-	-	-	-	-	-	-	-	-	-	-
Formic Acid	mg/L	-	-	-	-	-	-	-	-	-	-	-	-
Hexanoic Acid	mg/L	-	-	-	-	-	-	-	-	-	-	-	-
iso-Butyric Acid	mg/L	-	-	-	-	-	-	-	-	-	-	-	-
Isovaleric acid	mg/L	-	-	-	-	-	-	-	-	-	-	-	-
Proponic Acid	mg/L	-	-	-	-	-	-	-	-	-	-	-	-
Valeric Acid	mg/L	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Organic Compounds (VOCs)													
Bromobenzene	mg/L	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Bromochloromethane	mg/L	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Bromodichloromethane	mg/L	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Bromoform	mg/L	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Bromomethane	mg/L	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
n-Butylbenzene	mg/L	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
sec-Butylbenzene	mg/L	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
tert-Butylbenzene	mg/L	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Carbon tetrachloride	mg/L	0.0015	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Chlorobenzene	mg/L	0.0013	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Chloroethane	mg/L	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Chloroform	mg/L	0.018	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Chloromethane	mg/L	-	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
2-Chlorotoluene	mg/L	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
4-Chlorotoluene	mg/L	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Dibromochloromethane	mg/L	0.19	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
1,2-Dibromo-3-chloropropane	mg/L	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
1,2-Dibromoethane	mg/L	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Dibromomethane	mg/L	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
1,2-Dichlorobenzene	mg/L	0.0007	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
1,3-Dichlorobenzene	mg/L	-	<0.0010	<0.0010	<0.0010	<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	<0.0010	<0.0010	<0.0010
1,1-Dichloroethane	mg/L	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
1,2-Dichloroethane	mg/L	0.005	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
1,1-Dichloroethene	mg/L	0.014	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
1,2-Dichloroethene (cis)	mg/L	-	0.0021	0.0011	0.0010	0.0016	0.0066	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
1,2-Dichloroethene (trans)	mg/L	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Dichlorodifluoromethane	mg/L	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
1,2-Dichloropropane	mg/L	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
1,3-Dichloropropane	mg/L	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
2,2-Dichloropropane	mg/L	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
1,1-Dichloropropene	mg/L	-	<0.0010	<0.0010	<0.0010	<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	<0.0015	<0.0015
1,3-Dichloropropene [cis]	mg/L	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
1,3-Dichloropropene [trans]	mg/L	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Hexachlorobutadiene	mg/L	0.0013	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
p-Isopropyltoluene	mg/L	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Methyl t-Butyl Ether (MTBE)	mg/L	0.015	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Methylene Chloride	mg/L	0.05	<0.0010	<0.0010	<0.0010	<0.0010	0.0016	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
iso-Propylbenzene (cumene)	mg/L	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
n-Propylbenzene	mg/L	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
1,1,1,2-Tetrachloroethane	mg/L	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
1,1,2,2-Tetrachloroethane	mg/L	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Tetrachloroethene (PCE)	mg/L	0.01	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
1,2,3-Trichlorobenzene	mg/L	0.008	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
1,2,4-Trichlorobenzene	mg/L	0.015	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
1,1,1-Trichloroethane	mg/L	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
1,1,2-Trichloroethane	mg/L	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Trichloroethene	mg/L	0.00032	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Trichlorofluoromethane	mg/L	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Trihalomethanes	mg/L	0.1	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
1,2,3-Trichloropropane	mg/L	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
1,2,4-Trimethylbenzene	mg/L	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
1,3,5-Trimethylbenzene	mg/L	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Vinyl chloride	mg/L	0.0011	0.0010	<0.0010	<0.0010	<0.0010	**0.0027**	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010

Notes:

[1] Alberta Environment and Protected Areas (Alberta EPA). 2024. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. Referenced guidelines are for coarse-textured soils

[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 (FAL). Most conservative values

[3] Guideline varies with hardness. Values shown based on site hardness range of 386 mg/L to 640 mg/L (October, 2025).

[4] Guideline varies with chloride. Values shown based on site chloride range of 38.4 mg/L to 640 mg/L (October, 2025)

[5] Guideline varies with pH. Values shown based on site pH range of 7.00 to 7.34 (October, 2025).

[6] Guideline varies with pH and temperature. Values shown based on pH range of 7.00 to 7.34 and temperature range of 8.81°C to 11.53°C (October, 2025).

"-" No applicable guideline or no analyzed concentration.

BOLD - Greater than Tier 1 Guideline.

N/A - Not applicable.

Analytical detection limit is greater than the guideline.

Table 3: Groundwater Quality Assurance/Quality Control Analytical Results

Parameter	Unit	RDL	BH8	DUPLICATE	RPD (%)	22MW05	DUPLICATE	RPD (%)	22MW05	DUPLICATE	RPD (%)
			31-May-2023	31-May-2023		8-Nov-2023	8-Nov-2023		16 Oct 2025	16 Oct 2025	
Routine											
pH	pH Units	0.1	7.60	7.71	0.7	7.48	7.47	0.1	7.45	7.43	N/A
Electrical Conductivity (EC)	µS/cm	1	1,330	1,320	0.4	1,040	1,060	1.0	1060	1060	0.0
Total Dissolved Solids (TDS)	mg/L	1	879	846	1.9	670	672	0.1	**663**	**652**	0.8
Hardness as $CaCO_3$	mg/L	0.5	762	749	0.9	417	420	0.4	386	386	0.0
Alkalinity (total as $CaCO_3$)	mg/L	1	625	580	3.6	554	556	0.2	538	520	1.7
Bicarbonate	mg/L	1	762	708	3.5	676	679	0.2	656	634	1.7
Carbonate	mg/L	1	<1.0	<1.0	-	<1.0	<1.0	-	<0.6	<0.6	-
Hydroxide	mg/L	1	<1.0	<1.0	-	<1.0	<1.0	-	<0.3	<0.3	-
Calcium	mg/L	0.05	194	190	1.0	94.6	95.8	0.6	89.1	89.1	0.0
Magnesium	mg/L	0.005	67.5	66.6	0.7	44.0	43.9	0.1	39.8	39.7	0.1
Potassium	mg/L	0.05	3.68	3.59	1.2	7.91	8.00	0.6	6.5	6.79	2.2
Sodium	mg/L	0.05	60.0	58.4	1.3	87.6	87.4	0.1	77	76.6	0.3
Chloride	mg/L	0.5	63.4	63.4	0.0	48.7	48.7	0.0	60.0	60.5	0.4
Fluoride	mg/L	0.02	0.105	0.102	1.4	0.262	0.252	1.9	0.267	0.268	0.2
Sulphate	mg/L	0.3	96.9	97.1	0.1	1.67	1.67	0.0	<1.50	<1.50	-
Anions Total	meq/L	0.1	-	-	-	-	-	-	12.5	12.1	1.6
Cations Total	meq/L	0.1	-	-	-	-	-	-	12.4	12.3	0.4
Cation - Anion Balance	%	0.01	-	-	-	-	-	-	-0.4	0.82	N/A
Ionic Balance	N/A	0.01	110	114	1.8	104	105	0.5	99	102	N/A
Nutrients											
Ammonia as N	mg/L	0.005	0.223	0.220	0.7	3.16	3.25	1.4	3.38	2.98	5.9
Nitrate (as NO_3-N)	mg/L	0.02	0.129	0.120	3.5	0.028	0.027	-	<0.100	<0.100	-
Nitrite (as NO_2-N)	mg/L	0.01	<0.010	<0.010	-	<0.010	<0.010	-	<0.050	<0.050	-
Nitrate and Nitrite (as N)	mg/L	0.112	-	-	-	-	-	-	<0.112	<0.112	-
Dissolved Metals											
Aluminum	mg/L	0.001	0.0022	0.0016	-	0.0228	0.0182	-	0.0018	0.0019	-
Antimony	mg/L	0.0001	0.00014	0.00013	-	<0.00010	<0.00010	-	<0.00010	<0.00010	-
Arsenic	mg/L	0.0001	0.00083	0.00076	4.2	0.0102	0.0104	1.0	**0.0193**	**0.0197**	1.0
Barium	mg/L	0.0001	0.572	0.580	0.7	0.738	0.746	0.5	0.816	0.811	0.3
Boron	mg/L	0.01	0.059	0.057	1.7	0.086	0.084	1.2	0.085	0.085	0.0
Cadmium	mg/L	0.000005	0.0000557	0.0000548	0.8	<0.0000050	<0.0000050	-	<0.0000050	<0.0000050	-
Chromium	mg/L	0.0005	<0.00050	<0.00050	-	<0.00050	<0.00050	-	<0.00050	<0.00050	-
Copper	mg/L	0.0002	0.00080	0.00068	-	0.00028	0.00024	-	<0.00020	<0.00020	-
Iron	mg/L	0.01	0.166	0.162	1.2	11.0	11.0	0.0	24	23.8	0.4
Lead	mg/L	0.00005	<0.000050	<0.000050	-	<0.000050	<0.000050	-	<0.000050	<0.000050	-
Manganese	mg/L	0.0001	0.965	0.943	1.1	1.62	1.63	0.3	**1.68**	**1.69**	0.3
Mercury	mg/L	0.000005	<0.0000050	<0.0000050	-	<0.0000050	<0.0000050	-	<0.0000050	<0.0000050	-
Nickel	mg/L	0.0005	0.00368	0.00365	0.4	0.00098	0.00103	-	0.00086	0.00081	-
Selenium	mg/L	0.00005	0.00105	0.000976	3.5	0.000114	0.000162	-	0.000146	0.000142	-
Silver	mg/L	0.00001	<0.000010	<0.000010	-	<0.000010	<0.000010	-	<0.000010	<0.000010	-
Uranium	mg/L	0.00001	0.00784	0.00794	0.6	0.000460	0.000438	2.4	0.000358	0.000346	1.7
Zinc	mg/L	0.001	0.0013	<0.0010	-	0.0011	<0.0010	-	<0.0010	<0.0010	-
Hydrocarbons											
Benzene	mg/L	0.0005	<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	-
Ethylbenzene	mg/L	0.0005	<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	-
Xylenes (m & p)	mg/L	0.0004	<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	-
Styrene	mg/L	0.0005	<0.00050	<0.00050	-	<0.00050	<0.00050	-	<0.00050	<0.00050	-
Total BTEX	mg/L	0.001	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.0010	<0.0010	-

Notes:
RDL - Reportable detection limit.
RPD - Relative Percentage Difference calculated as RPD(%)=(|V1-V2|)/[(V1+V2)/2])*100 where V1,V2 = concentrations of parent and duplicate sample, respectively.
"-" Indicates RPD not calculated. RPDs have only been considered where both concentrations are greater than 5 times the RDL.
N/A - Not applicable. Used for pH (logarithmic) and calculated parameters.
BOLD - RPD value greater than 20%.

Table 3: Groundwater Quality Assurance/Quality Control Analytical Results

Parameter	Unit	RDL	BH8	DUPLICATE	RPD (%)	22MW05	DUPLICATE	RPD (%)	22MW05	DUPLICATE	RPD (%)
			31-May-2023	31-May-2023		8-Nov-2023	8-Nov-2023		16 Oct 2025	16 Oct 2025	
Volatile Organic Compounds (VOCs)											
1,1,1,2-Tetrachloroethane	mg/L	0.001	<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	-
1,1,2,2-Tetrachloroethane	mg/L	0.001	<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	-
1,1-Dichloroethane	mg/L	0.001	<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	-
1,1-Dichloropropene	mg/L	0.001	<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	-
1,2,3-Trichloropropane	mg/L	0.001	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.00050	<0.00050	-
1,2,4-Trichlorobenzene	mg/L	0.001	<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	-
1,2-Dibromo-3-chloropropane	mg/L	0.001	<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	-	<0.0050	<0.0050	-
1,2-Dichlorobenzene	mg/L	0.0005	<0.00050	<0.00050	-	<0.00050	<0.00050	-	<0.0010	<0.0010	-
1,2-Dichloroethane	mg/L	0.001	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.0010	<0.0010	-
1,2-Dichloroethene (cis)	mg/L	0.001	0.0011	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	-
1,2-Dichloropropane	mg/L	0.001	<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	-
1,3-Dichlorobenzene	mg/L	0.001	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.00050	<0.00050	-
1,3-Dichloropropane	mg/L	0.001	<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	-	<0.0010	<0.0010	-
1,3-Dichloropropene [cis]	mg/L	0.001	<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	-
1,4-Dichlorobenzene	mg/L	0.001	<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	-
2-Chlorotoluene	mg/L	0.001	<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	-
Bromobenzene	mg/L	0.001	<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	-
Bromodichloromethane	mg/L	0.001	<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	-
Bromomethane	mg/L	0.001	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.0015	<0.0015	-
Carbon tetrachloride	mg/L	0.0005	<0.00050	<0.00050	-	<0.00050	<0.00050	-	<0.0010	<0.0010	-
Chlorobenzene	mg/L	0.001	<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	-
Chloroform	mg/L	0.001	<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	-	<0.00050	<0.00050	-
Dibromochloromethane	mg/L	0.001	<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	-
Dichlorodifluoromethane	mg/L	0.001	<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	-
iso-Propylbenzene (cumene)	mg/L	0.001	<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	-	<0.0010	<0.0010	-
Methylene Chloride	mg/L	0.001	<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	-
n-Propylbenzene	mg/L	0.001	<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	-
sec-Butylbenzene	mg/L	0.001	<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	-
Tetrachloroethene	mg/L	0.001	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.0020	<0.0020	-
Trichloroethene	mg/L	0.001	<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	-
Trihalomethanes	mg/L	0.002	<0.0020	<0.0020	-	<0.0020	<0.0020	-	<0.0010	<0.0010	-
Vinyl chloride	mg/L	0.001	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.0010	<0.0010	-

Notes:
RDL - Reportable detection limit.
RPD - Relative Percentage Difference calculated as RPD(%)=(|V1-V2|)/[(V1+V2)/2])*100 where V1,V2 = concentrations of parent and duplicate sample, respectively.
"-" Indicates RPD not calculated. RPDs have only been considered where both concentrations are greater than 5 times the RDL.
N/A - Not applicable. Used for pH (logarithmic) and calculated parameters.
BOLD - RPD value greater than 20%.

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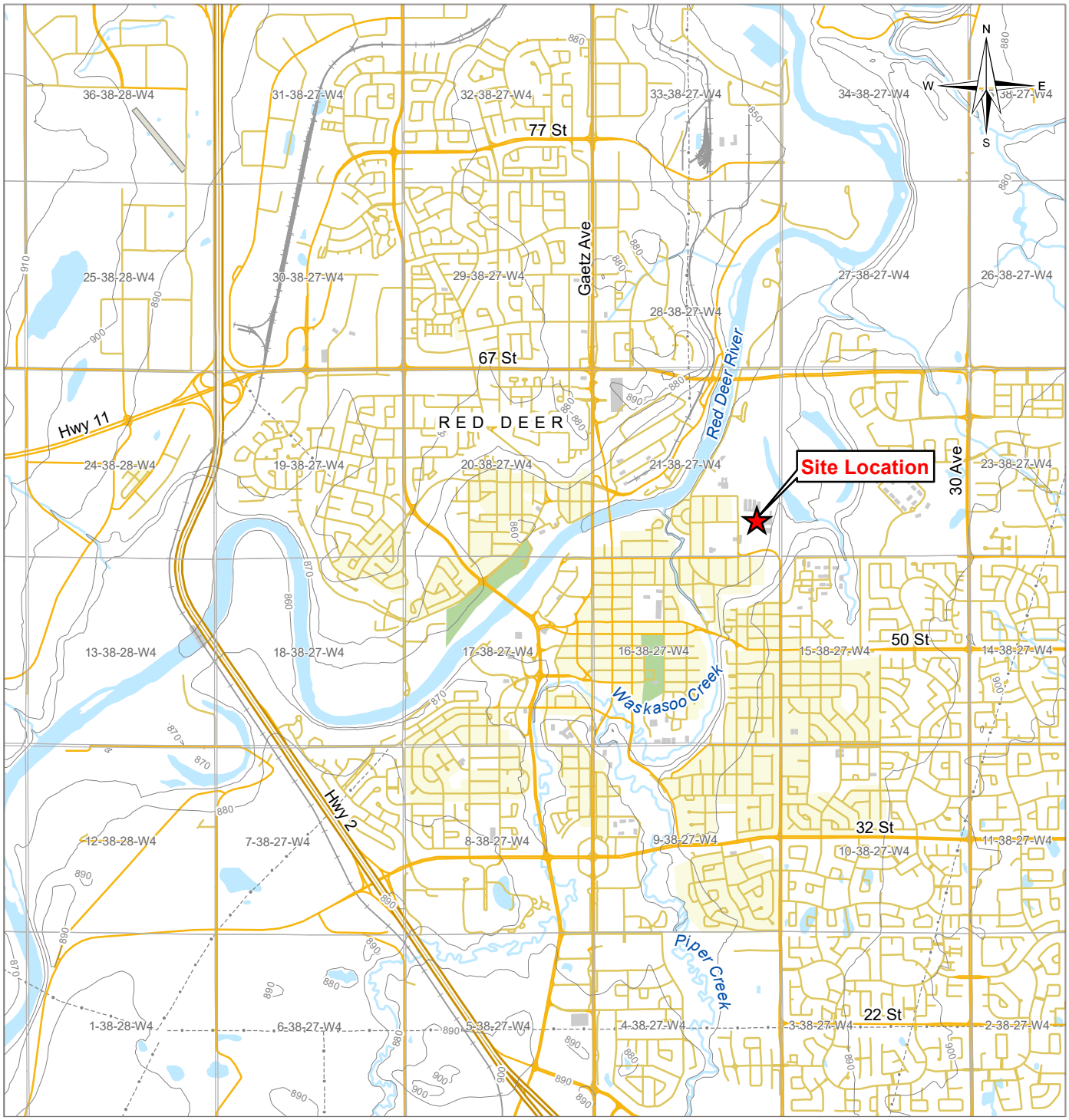
FIGURES



LEGEND

- Site Location
- Highway
- Main Road
- Local Road
- Resource/Recreational Road
- Railway
- Power Line
- Runway
- Building
- Park
- Residential Area
- Contour (10 m)
- Watercourse
- Waterbody

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

2025 GROUNDWATER MONITORING REPORT
LINDSAY THURBER HIGH SCHOOL

Site Location Plan

PROJECTION	DATUM	CLIENT
3TM 114	NAD83	The City of Red Deer

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

FILE NO. SWOP04071-05_Figure1_SiteLocation.mxd

OFFICE	DWN	CKD	APVD	REV
Tt-EDM	BB	SL	KH	0

DATE	PROJECT NO.
November 26, 2025	SWM.SWOP04071-05.008

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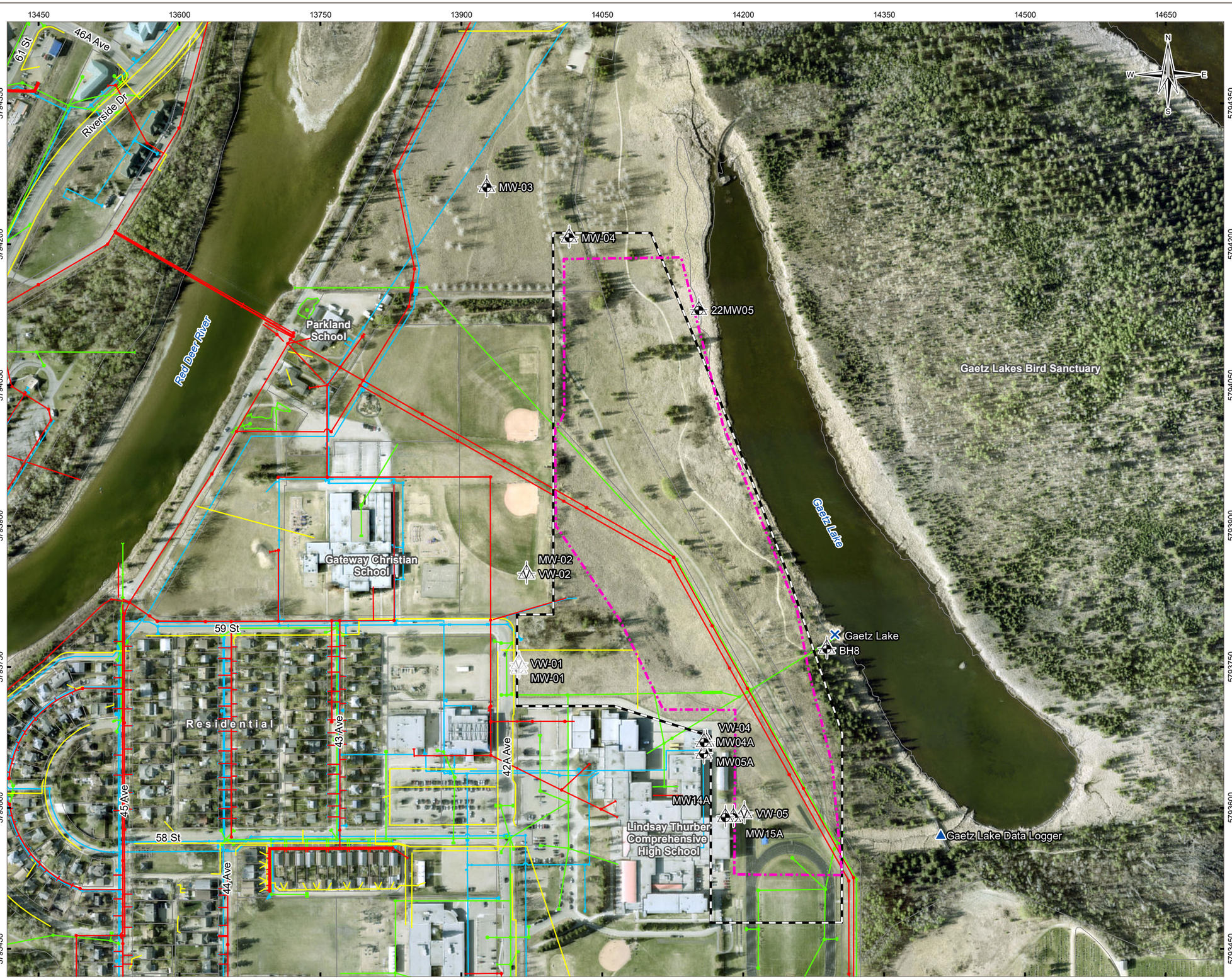
Figure 1

G:\SOLID_WASTE\SWOP\SWOP04071-05\GIS\Maps\SWOP04071-05_Figure1_SiteLocation.mxd modified 11/26/2025 by Brittney.Bietz



LEGEND

- Monitoring Well - Faded symbol indicates a presumably destroyed well
- Vapour Well - Faded symbol indicates a presumably destroyed well
- Data Logger
- Surface Monitoring Location
- Historic Waste Disposal (Provided by Tiamat, 2014)
- Site Boundary
- Lot Boundary

Utilities

- Electrical
- Sanitary
- Storm
- Water

NOTES

Base data source: Imagery provided by ESRI; Red Deer County (2024)
Roads from City of Red Deer Open Data, 2018
Utilities provided by City of Red Deer. Locations have not been field verified, and should not be used for construction or other intrusive field activities.

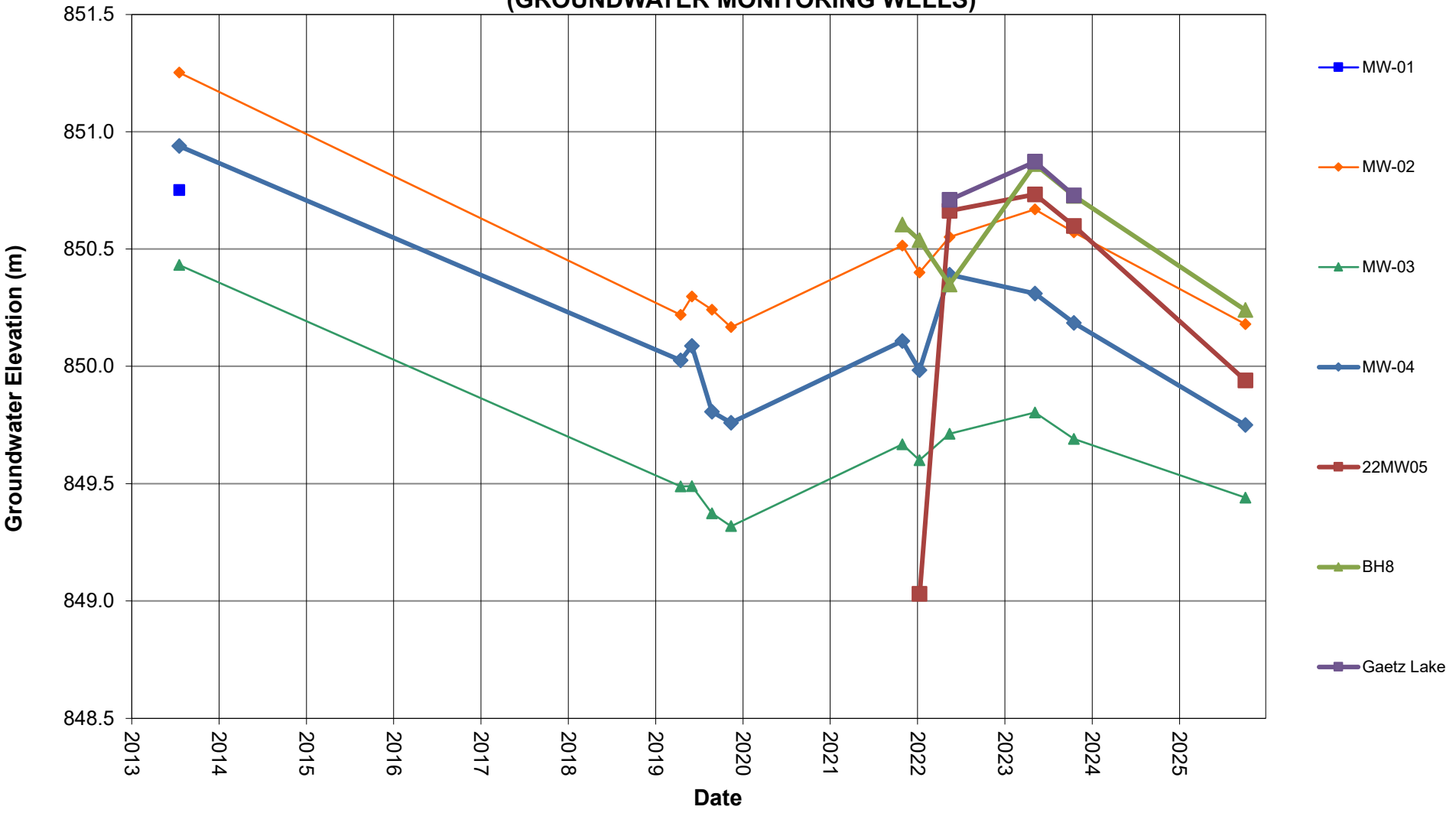
2025 GROUNDWATER MONITORING REPORT
LINDSAY THURBER HIGH SCHOOL

Site Plan and Surrounding Land Use

PROJECTION 3TM 114		**DATUM** NAD83			**CLIENT** The City of Red Deer
Scale: 1:4,000 — 80 40 0 80 Metres					TETRA TECH
FILE NO. SWOP04071-05_Figure2_LandUse.mxd					
OFFICE Tt-EDM	**DWN** BB	**CKD** SL	**APVD** KH	**REV** 0	**Figure 2**
DATE November 26, 2025	**PROJECT NO.** SWM.SWOP04071-05.008				

G:\SOLID_WASTE\SWOP\SWOP04071-05\GIS\Maps\SWOP04071-05_Figure2_LandUse.mxd modified 11/26/2025 by Brittney Bietz

FIGURE 3
HISTORICAL GROUNDWATER ELEVATIONS
(GROUNDWATER MONITORING WELLS)



LEGEND

- Monitoring Well
- Presumably Destroyed Monitoring Well
- Vapour Well
- Presumably Destroyed Vapour Well
- Data Logger
- Surface Monitoring Location
- Inferred Groundwater Flow Direction
- Groundwater Elevation Contour (0.1 masl)
- (8XX.XX) Groundwater Elevation (masl)
- Historic Waste Disposal (Provided by Tiamat, 2014)
- Road

NOTES
Base data source: Imagery provided by ESRI; Red Deer County (2024)
Roads from City of Red Deer Open Data, 2018
masl - metres above sea level
* - not measured

2025 GROUNDWATER MONITORING REPORT
LINDSAY THURBER HIGH SCHOOL

Groundwater Elevation Contours
October 2025

PROJECTION	DATUM	CLIENT
3TM 114	NAD83	The City of Red Deer

Scale: 1:3,000
50 25 0 50
Metres

FILE NO.
SWOP04071-05_Figure4_GW_Oct2025.mxd

OFFICE	DWN	CKD	APVD	REV
Tt-EDM	BB	SL	KH	0

DATE	PROJECT NO.
December 2, 2025	SWM.SWOP04071-05.008

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Figure 4

G:\SOLID_WASTE\SWOP\SWOP04071-05\GIS\Maps\SWOP04071-05_Figure4_GW_Oct2025.mxd modified 12/2/2025 by Brittney Bietz

APPENDIX A

TETRA TECH'S LIMITATIONS ON THE USE OF THIS DOCUMENT

LIMITATIONS ON USE OF THIS DOCUMENT

GEOENVIRONMENTAL

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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.

APPENDIX B

SITE HISTORY, HISTORICAL INFORMATION, AND SITE SETTING

1.0 SITE HISTORY

The following section summarizes the history of the Lindsay Thurber Comprehensive High School (LTCHS) site and was developed for the 2019 groundwater and soil vapour monitoring report[1].

The LTCHS was initially constructed in 1954. Waste disposal at the site is estimated to have occurred from 1965 to 1967 (two years), adjacent to the school. Historical information indicates the waste as being household municipal solid waste (MSW) including a mixture of plastics, cans, paper, scrap metals, wires, and glass. Bricks, wood, and concrete were also encountered during the Phase II environmental site assessment (ESA) investigation[2]. A historical ESA conducted on behalf of the Red Deer Public Schools District No. 104[3] identified that the waste was understood to be generally infilled in natural depressions, founded on the alluvial gravels; the water table was indicated to be at or just below the base of the waste level.

Historical waste disposal was identified during the 2014 Phase II ESA to be east and north of LTCHS. The waste area extends to the north into an undeveloped field, to the east towards Gaetz Lake, to the LTCHS track in the south, and to the boundary of the Gateway Christian School (formerly River Glen School) yard in the west. Estimated waste extents are identified on Figure 2. The Phase II ESA estimated the total area of buried waste at approximately 105,800 m^2. The former landfill is inactive and closed.

Results of the Phase II ESA conducted by Tiamat Environmental Consultants Ltd. (Tiamat) indicate that surface material of sand and loam was overlying the buried MSW material. Strong odours were released during the drilling activities near surface. The cover soils ranged from 10 cm to 50 cm in thickness. The MSW was mixed with fill consisting of silty sand. Groundwater was encountered at approximately 2.8 m below grade (mbg).

2.0 HISTORICAL GROUNDWATER MONITORING AND INVESTIGATION SUMMARY

Monitoring wells were installed in 2013, including four groundwater monitoring wells (MW-01 to MW-04), five vapour wells (VW-01 to VW-05) within and beside the waste material boundary, and a further eight testhole locations were drilled.

Previous reports prepared by Tiamat include the following:

- Phase I Environmental Site Assessment, Historic Waste Disposal Site, Lindsay Thurber High School, The City of Red Deer. September 24, 2013[4].
- Phase II Environmental Site Assessment, Historic Waste Disposal Site, Lindsay Thurber High School, The City of Red Deer. March 6, 2014[2].

[1] Tetra Tech Canada Inc. 2020. 2019 Groundwater and Soil Vapour Monitoring Report – Lindsay Thurber Comprehensive High School. Prepared for The City of Red Deer. October 2020. Project Number: 704-SWM.SWOP04071-01.002.

[2] Tiamat Environmental Consultants Ltd. 2014. Phase II Environmental Site Assessment, Historic Waste Disposal Site, Lindsay Thurber High School, The City of Red Deer. Dated March 6, 2014.

[3] Parkland Geotechnical Consulting. 2004. Phase 2 – Environmental Site Investigation, Landfill at Lindsay Thurber Comprehensive High School Property, SE 21-38-27-W4M, Red Deer Alberta. Dated June 2004.

[4] Tiamat Environmental Consultants Ltd. 2013. Phase I Environmental Site Assessment, Historic Waste Disposal Site, Lindsay Thurber High School, The City of Red Deer. Dated September 24, 2013.

- Environmental Risk Management Plan, Historic Waste Disposal Sites, Lindsay Thurber High School, The City of Red Deer. April 1, 2014[5].

The above work supplemented earlier investigation by Parkland Geotechnical Consulting[3] (Parkland Geotechnical) which included numerous additional testhole locations. The results of the Phase II ESA conducted by Tiamat in 2014 indicated the following:

- The waste disposal area is estimated to be 105,800 m^2 and is overlying native gravels and sand.
- Groundwater was located at approximately 2.8 mbg and is within the waste material. The horizontal gradient is 0.3% towards the northwest. The horizontal permeability of 10^{-5} m/sec for the sand unit was applied giving a horizontal velocity of 2.7 m/day.
- Volatile organic compounds (VOCs) and petroleum hydrocarbons (PHCs) were not detected at the hydraulically down-gradient groundwater monitoring wells in 2013.
- Several parameters indicative of leachate were present in the groundwater samples collected hydraulically down-gradient of site. Leachate indicator parameters at these wells consisted of inorganic compounds and nutrients and indicated high negative redox potential and anoxic conditions in the groundwater.
- Schools, residential homes, natural areas, and public buildings are located on adjacent and nearby lands of the site. No nearby activities were interpreted to be environmental concerns relative to the site.
- Soil vapour samples from the vapour wells at LTCHS contained volatile PHCs to carbon chain 12 and semi-volatile, oxygenated, and halogenated volatile hydrocarbons and ketones.

The recommendations of the program were as follows:

- Monitor groundwater elevations and soil vapour data quarterly for one hydrogeological cycle.
- Determine if additional groundwater wells should be included to determine exposure from leachate contaminants.
- Collect an additional set of soil vapour and groundwater analytical data, groundwater elevations, and volatile headspace measurement during the winter months to determine seasonal changes in soil vapour concentrations.
- Develop a risk management plan (RMP) to consider future land uses and address environmental concerns.
- Review all data to update the RMP with new information.

The recommendations of a subsequent RMP[5] were as follows:

- An additional monitoring event may be effective in verifying the mitigation methods for development at the site.
- Information in the preliminary quantitative risk assessment (PQRA) should be updated as new site information is obtained.
- A review of the RMP should be completed when the PQRA information is updated, if there are changes to the chemicals of potential concern (COPCs).
- The RMP should be reviewed and updated at five-year intervals.

[5] Tiamat Environmental Consultants Ltd. 2014. Environmental Risk Management Plan, Historic Waste Disposal Sites, Lindsay Thurber High School, The City of Red Deer. Dated April 1, 2014.

On February 1, 2022, one new groundwater monitoring well (22MW05) was installed using a tracked drill rig and solid stem auger along the northwest side of Gaetz Lake. The well location was selected to assess the groundwater conditions in between the waste footprint and Gaetz Lake. Monitoring well 22MW05 was installed with 51 mm diameter polyvinyl chloride (PVC) pipe to a depth of 4.5 mbg and was screened with 51 mm slotted PVC pipe from 1.5 mbg to 4.5 mbg.

Available borehole logs for the site are included in Appendix F.

3.0 GAS MITIGATION

Historical assessment work in 2004[3] recommended a gas interceptor trench along the east side of the school, and sealing of utility trenches in the vicinity. Subsequently, an RMP and landfill gas (LFG) management proposal was prepared by Parkland Geotechnical[6] in support of a waiver request by the Red Deer Public Schools District No. 104 to reduce the setback for new development. While the setback would only apply to planned renovations and expansion at the school, we understand the intent of the system was to address both existing and new development. Based on the proposed design[6], we understand the system was proposed to include the following:

- An engineered barrier composed of a trench filled with permeable aggregate, approximately 200 m long and approximately 25 m from the eastern wall of the school. The trench would extend to approximately 5 m depth (0.5 m to 1.0 m below the water table), and the uppermost 1.2 m of the trench would be backfilled with a clay cap.
- A 30 mil geomembrane would be installed on the western side of the trench (i.e., closest to the school). A ventilation pipe would be installed near the base of the trench, and a vacuum/blower would be connected to allow active ventilation of any gas build up.
- On the west side of the trench, some degree of sealing/plugs would be used in utility backfill, and any encountered waste or permeable soils would be removed and replaced with fine-grained materials. Further, a ‘degassing program’ would be undertaken west of the trench using existing wells.
- A deeper horizontal drain was also described at the base of the trench, and below the water table, to allow for possible gas stripping, if required.
- A monitoring program would be implemented, including installation of new probes, indoor air monitoring, and automated monitoring/alarms within the building.

The reporting indicates that the waiver application was made in consultation with the School District, The City of Red Deer (The City), the David Thompson Health District, and Alberta Environment. It further noted that the recommended design was based on the existing landfill capping, and that if cap improvements were to be made in the future (e.g., installation of an impermeable cover), that further evaluation of the system would be required.

Further details of the setback request and as-built or record details of the trench are not known; however, subsequent reporting[7] indicates the system was installed in March 2005.

[6] Parkland Geotechnical Consulting. 2004b. Landfill Gas Control Proposal and Risk Management Plan, Old Landfill Near Lindsay Thurber Comprehensive High School, SE 21-38-27-W4M, Red Deer Alberta. Dated August 2004.

[7] Parkland Geotechnical Consulting. 2019. Lindsay Thurber Comprehensive High School, 2019 Gas Monitoring Program, Summary of Results – November Event, Red Deer Alberta. Dated February 2019.

The Tiamat Phase I report included copies of two monitoring reports prepared in relation to the LFG interceptor trench and covering semi-annual monitoring undertaken between 2009 and 2013[8][9]. Subsequent monitoring reports were reviewed from 2014 and most recently 2022[10]. The results demonstrated the trench was effective at limiting subsurface methane concentrations west of the trench. The monitoring program as reported was focused on LFG probes and did not reference active ventilation or indoor air monitoring. The most recent reporting[10] indicates that the monitoring was initially monthly, then has been semi-annual between 2009 and the 2022 reporting period. We are not aware of details of the current operation of the interceptor trench or the nature of interior monitoring, if any.

4.0 SITE SETTING

The following section presents an overview of the regional and local setting for the site.

4.1 Geology

The following sections summarize the regional and local geology.

4.1.1 Geological Setting and Stratigraphy

The City and site are located within the Red Deer River drainage basin with principal drainage via the Red Deer River located west of the site. The river has incised the uplands with gentle slopes to the east and west of the river in the vicinity of the site.

The geology in the river valley is characterized by fluvial surficial sediments deposited by the Red Deer River, overlying shale and sandstone bedrock of the Paskapoo Formation. Historical oxbows of the river are evident in the river valley, including the adjacent Gaetz Lake.

Key elements of the geological setting are presented below from Tiamat's 2013 Phase I Report[4]:

"The fertile black soil in the region (Penhold Loam) is of alluvial lacustrine origin. The Penhold Loam is a well-drained fine sandy loam classified as Chernozemic. It is generally stone free and in natural areas, is typically 1.5 m thick, more or less.

The Quaternary deposits consist of drift deposits of clay, silt, gravel and sand. Published information indicates the banks of the Red Deer River comprise of dirty gravel with thickness ranging from 6 to 12 m, more or less.

In the valley, lies preglacial Saskatchewan gravels and sand. Terrace gravels hydraulically connected to the Red Deer River are a known resource of groundwater. Surficial soils comprise largely of poorly to moderately sorted sand, silt and gravel with a varying amount of clay. The fluvial sediments generally have obscure bedding planes. Medium to coarse sized gravel with cross-bedded sand have been documented."

The Tertiary bedrock consists of sequences of alternating shales and sandstones of the Paskapoo Formation. The Paskapoo Formation underlies the gravel sediments. This non-marine bedrock is composed of mudstone, siltstone and sandstone. The formation of the Rocky Mountains subjected the Paskapoo Formation to a regional stress-induced fracture pattern."

[8] Parkland Geotechnical Consulting. 2011. Lindsay Thurber Comprehensive High School, 2011 Gas Monitoring Program. Dated October 31, 2011.

[9] Parkland Geotechnical Consulting. 2013. Lindsay Thurber Comprehensive High School, 2013 Gas Monitoring Program. Dated June 3, 2013.

[10] Northshore Environmental Consultants. 2021. Lindsay Thurber High School. Methane Monitoring Report – October 2022 Sampling Event. Dated November 7, 2022.

4.1.2 Local Geology

The site is relatively flat, slightly sloping towards the northwest. Based on the borehole logs completed during the Phase II ESA conducted by Tiamat, in the waste footprint there are soils comprised of loam and sand fill overlying the MSW to depths of approximately 5 mbg. The wastes are overlying clay and sand. Outside of the waste footprint, there are surficial fills to a depth of approximately 5 mbg, overlying sandstone bedrock, which was encountered at MW-01, MW-02, and MW-04, based on Tiamat's cross-sections[2]. The presence of bedrock near 5 mbg at these three borehole locations suggests that the buried channel that is mapped as trending northeasterly, approximately beneath LTCHS[11], is not present in that area of the site. MSW was encountered at all testholes extending north to south (A to A'), in the northeastern portion of the site (B) and in the southern portion of the site east of LTCHS (C')[2].

4.2 Hydrogeology

The following sections summarize the regional and local hydrogeology.

4.2.1 Regional Hydrogeology

The regional hydrogeology is most influenced by the presence of the river sediments situated within the valley along the Red Deer River and a bedrock valley trending north-northeast in the vicinity of the site.

Key elements of the hydrogeological setting are presented below from Tiamat's 2013 Phase I Report[4]:

"A significant buried valley and aquifer resource trending northeastward through the city has been partially mapped and lies in the SE 28-38-27 W4M (MacKenzie Trail and Riverside). This buried valley extends to a depth of 21 m, more or less and may extend to the south into north portions of 21-28-27 W4M." Mapping by the Alberta Geological Survey[15] indicates that the valley could be beneath the site trending in a north-northeast direction; however, the width of the valley is not defined.

"The dominant type of near-surface groundwater in the Paskapoo Formation in the area of assessment is sodium bicarbonate. Notable concentrations of sodium sulphate type groundwater have also been reported. The quality of groundwater for potable use is generally suitable to depths of 300 m on the west side of Red Deer and decreases to 90 m, more or less in the east.

Areas of recharge (downward flow) in unsaturated heterogeneous sediments include most areas above the river and creek valleys, whereas; the river valleys will generally exhibit discharge. The distribution of groundwater in the area can also be influenced by the local geology, topographic relief, areas of artesian flow, springs and reasonable yielding water source wells.

Numerous permanent surface water features within The City of Red Deer and vicinity include Red Deer River, Waskasoo Creek, Gaetz Lakes, Hazlett Lake, Bower Ponds (result of formerly mining gravel resources), various sloughs in the fringe areas of the city and an assortment of other smaller creeks and springs."

[11] Andriashek, L. comp. 2018. Thalwegs of bedrock valleys, Alberta (GIS data, line features); Alberta Energy Regulator, AER/AGS Digital Data 2018-0001.

The regional groundwater flow is expected to follow the bedrock topography and will be influenced by the varying distribution of sediments in the river valley, which will have been deposited in various historical channels since filled in under varying depositional environments. Further, the river is in hydrologic connection with the adjacent sediments; therefore, seasonal changes in the river stage will affect the local groundwater flow patterns (magnitude and direction). In seasons of higher river flow, bank storage will occur, whereas in seasons of lower flow (such as late summer/fall), the storage will be released.

4.2.2 Local Hydrogeology

The closest surface waterbody to the site is Gaetz Lake (westerly one) located adjacent to the east and the easterly Gaetz Lake, located approximately 580 m east of the site. The two lakes are a set of oxbow lakes that have been cut off from the Red Deer River, leaving free standing bodies of water[4]. The Red Deer River is located northwest of the site approximately 250 m from the north waste boundary. The river flows in a northerly direction. Shallow groundwater is assumed to flow towards the river[2].

4.3 Groundwater Resource Usage

A search of the Alberta Water Well Database in January 2020 for groundwater users within a 1 km radius of LTCHS identified nine water wells; two of the wells are listed as domestic use, one is listed as domestic and industrial use, three are listed as industrial use, and three are listed as investigation[12].

The nearest water well to site is located approximately 600 m northwest of site, on the opposite (west) side of the Red Deer River. The proposed well use is listed as for investigation purposes. The water wells within a 1 km radius of the site range from 4.5 mbg to 225 mbg. The status and use of the surrounding groundwater wells were not confirmed, and they were not field verified.

5.0 HAZARD QUOTIENTS

5.1 2019 Hazard Quotient Calculations

Using the soil vapour screening levels described in the Tetra Tech's 2019 groundwater and soil monitoring report and the soil vapour sampling results, included in Appendix E, estimated cancer risks (for carcinogens) and estimated hazard quotients (HQs) (for non-carcinogens) were calculated for the site.

Estimated risks are calculated by dividing the soil vapour concentration by the corresponding soil vapour screening level for carcinogenic effects and multiplying the ratio by the target risk level of 1×10^{-5}. Similarly, the estimated HQs represent the soil vapour concentration divided by the corresponding soil vapour screening level for non-carcinogenic effects.

For this evaluation, cumulative target risk and hazard levels were determined in accordance with Alberta Tier 2 Guidelines[13]. For carcinogens, the target risk level is 1×10^{-5}, as this value is considered by Health Canada to represent a negligible risk. This risk level applies to both individual compounds and a summation (i.e., cumulative) of individual compounds risks. For non-carcinogens a cumulative target hazard level of 1.0 is used as potential

[12] Alberta Environment and Parks. 2019. Water Well Database. Information obtained included in Appendix C. http://www.telusgeomatics.com/tgpub/ag_water/.

[13] Alberta Environment and Parks. 2019. Alberta Tier 2 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. 150 pp.

exposures that result in cumulative hazard indices equal to or less than 1.0 signify negligible potential for adverse health effects. For individual compounds, a hazard index of 0.2 was used. Each sampling location was screened individually for every chemical detected, and the results evaluated relative to both individual and cumulative risks and hazard levels.

The cumulative risk levels for carcinogens in the samples collected ranged between 5×10^{-7} and 3.4×10^{-8}. The cumulative hazard levels identified in the samples collected for the non-carcinogens ranged between 0.007 to 0.053.

The estimated individual and cumulative risks and hazards associated with the soil vapour samples collected in December 2019 did not exceed the corresponding target risk and hazard levels in any of the samples collected.

5.2 Review of the 2014 Hazard Quotients from the Risk Management Plan

The 2014 RMP prepared by Tiamat, proposed a site-specific environmental RMP as a tool to assist with the review of future subdivision applications on lands lying within the regulated setback distance from the site (300 m). The focus was on potential ingress of soil gas for COPCs with a HQ greater than 1.0. Residential land use was considered most sensitive, and exposure ratings for other land uses (e.g., school, public institutions, commercial complexes) were considered to not be greater than residential; however, unique exceptions would have to be reviewed and addressed on a site-specific basis[2]. Further, underground utility workers and subsurface utility infrastructure were considered relevant to potential exposure.

The RMP applied a 10x factor of safety to the HQs to address uncertainties. HQs from the RMP ranged up to 567 (including the 10x factor of safety). Based on these, the RMP then provided recommended generic mitigative measures based on the calculated HQs, ranging from passive to active measures, recognizing that the ultimate approach would require a design professional for the proposed development.

Following the 2014 RMP, the Canadian Council of Ministers of the Environment (CCME) released the document A Protocol for the Derivation of Soil Vapour Quality Guidelines for Protection of Human Exposures Via Inhalation of Vapours[14], designed to provide guidance for developing site-appropriate soil vapour quality guidelines. The guidelines developed using the methods outlined in the CCME document were used for this current study and are included with the vapour sampling results in Table 4. HQs were calculated using estimated dose (based on concentrations measured at the site) and divided by tolerable daily intake. Soil vapour concentrations from the Phase II ESA conducted in 2013 were not compared to soil vapour quality guidelines; however, spot checks of five target compounds with the highest HQs in the 2013 work (chloromethane, trichloroethene, tetrachloroethene, 1,2,4-trimethylbenzene, and cis-1,2-dichloroethene) identified that none of the 2013 concentrations would have unacceptable HQs using the updated CCME methodology.

The 2014 RMP was prepared concurrent to RMPs at several other former City landfills, and a common set of mitigative measures was applied based on the HQs. Subsequent to the 2014 RMP and to the release of the CCME Protocol document, The City undertook additional assessment at another former City Landfill (Montfort); as part of that work, their consultant XCG Consulting Limited (XCG) revised the 2014 RMP criteria ranges for each generic mitigative measure category to include a Cancer Risk range to allow comparison of the 2014 RMP ranges with the individual HQ and cancer risks calculated by XCG[15]. From that work, XCG identified the following generic mitigative measures for developments within a 300 m setback of these landfills (based on Tiamat 2014), and these have been adopted for this site.

[14] Canadian Council of Ministers of the Environment. 2014. A Protocol for the Derivation of Soil Vapour Quality Guidelines for Exposure Protection of Human Exposures via Inhalation of Vapours. Available online: http://cegg-rcqe.ccme.ca/en/index.html.

[15] XCG Consulting Limited. 2018. Vapour Intrusion Assessment and Environmental Monitoring Report, prepared for the City of Red Deer's Montfort Landfill.

Passive Measures

1. Passive Measures – Level A: for Cancer Risk of > $1E^{-5}$ and < $5E^{-5}$ and/or HQ >0.2 and <1.

   Compacted clay liner with a minimum thickness of 1 m and confirmed maximum hydraulic conductivity of 10^{-6} cm/sec.

2. Passive Measures – Level B: for Cancer Risk of > $5E^{-5}$ and < $5E^{-4}$ and/or HQ >1 and <5.

   Synthetic liner with type of material, thickness and installation details dependent on the design professional.

3. Passive Measures – Level C: for Cancer Risk of > $5E^{-4}$ and < $1E^{-3}$ and/or HQ >5 and <50.

   Passive sub-slab depressurization (SSD) system with a minimum depressurization of 4 Pa to 10 Pa. In some instances (such as a pervious subgrade), the actual depressurization necessary may require an active SSD or alternative active ventilation system.

Active Measures

Field verify the presence of the identified chemicals of concern and other potential chemicals in the soil gas state at the development site. If confirmed, determine the most appropriate manner to prevent soil vapour intrusion.

1. Active Measures – Level D: for Cancer Risk of > $1E^{-3}$ and < $2E^{-3}$ and/or HQ values >50 and <100.

   Active SSD must be configured to compensate for depressurization of the building and have adequate negative pressure gradients across the entire footprint of the foundation.

2. Active Measures – Level E: for Cancer Risk of >$2E^{-3}$ and/or HQ values >100.

   Installation of geomembrane and active soil vapour extraction with system fault notification alarm.

For consistency with XCG's approach from 2017, we compared individual HQs with the individual target hazard level (0.2). Based on the 2019 program, the greatest individual HQ calculated for the site was 0.0008 (versus the individual target hazard level of 0.2) and the greatest estimated cancer risk was 3.4×10^{-8} (versus target Risk of 1.0×10^{-5}). While development at the site is not currently proposed, for illustrative purposes, based on these HQs and cancer risk levels calculated from the 2019 vapour data, no passive or active measures would be required for the site. It is noted that even if the 10x factor of safety is applied, mitigative measures would still not be required. Similarly, with cumulative risks and HQs, the same conclusion can be drawn. The assumptions made in the calculations of HQs and cancer risk above are inherently conservative; therefore, applying a factor of safety is not needed.

Future applications for development within the setback are subject to review by The City. The developer's team would be responsible for reviewing and verifying the available data relative to their proposed development. The mitigative measures presented above are generic and can be used as a general guide for expectations by The City; ultimately, the developer's design engineer would be responsible for developing measures specific to the intended development based on the above or an appropriate equivalent. Protection of workers (e.g., construction and utility) should form part of any development plan.

REFERENCES

Alberta Environment and Parks. 2019. Alberta Tier 2 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. 150 pp.

Alberta Environment and Parks. 2019. Water Well Database. Information obtained included in Appendix C. Available online: http://www.telusgeomatics.com/tgpub/ag_water/.

Andriashek, L., comp. 2018. Thalwegs of bedrock valleys, Alberta (GIS data, line features). Alberta Energy Regulator, AER/AGS Digital Data 2018-0001.

Canadian Council of Ministers of the Environment. 2014. A Protocol for the Derivation of Soil Vapour Quality Guidelines for Exposure Protection of Human Exposures via Inhalation of Vapours. Available online: http://cegg-rcqe.ccme.ca/en/index.html.

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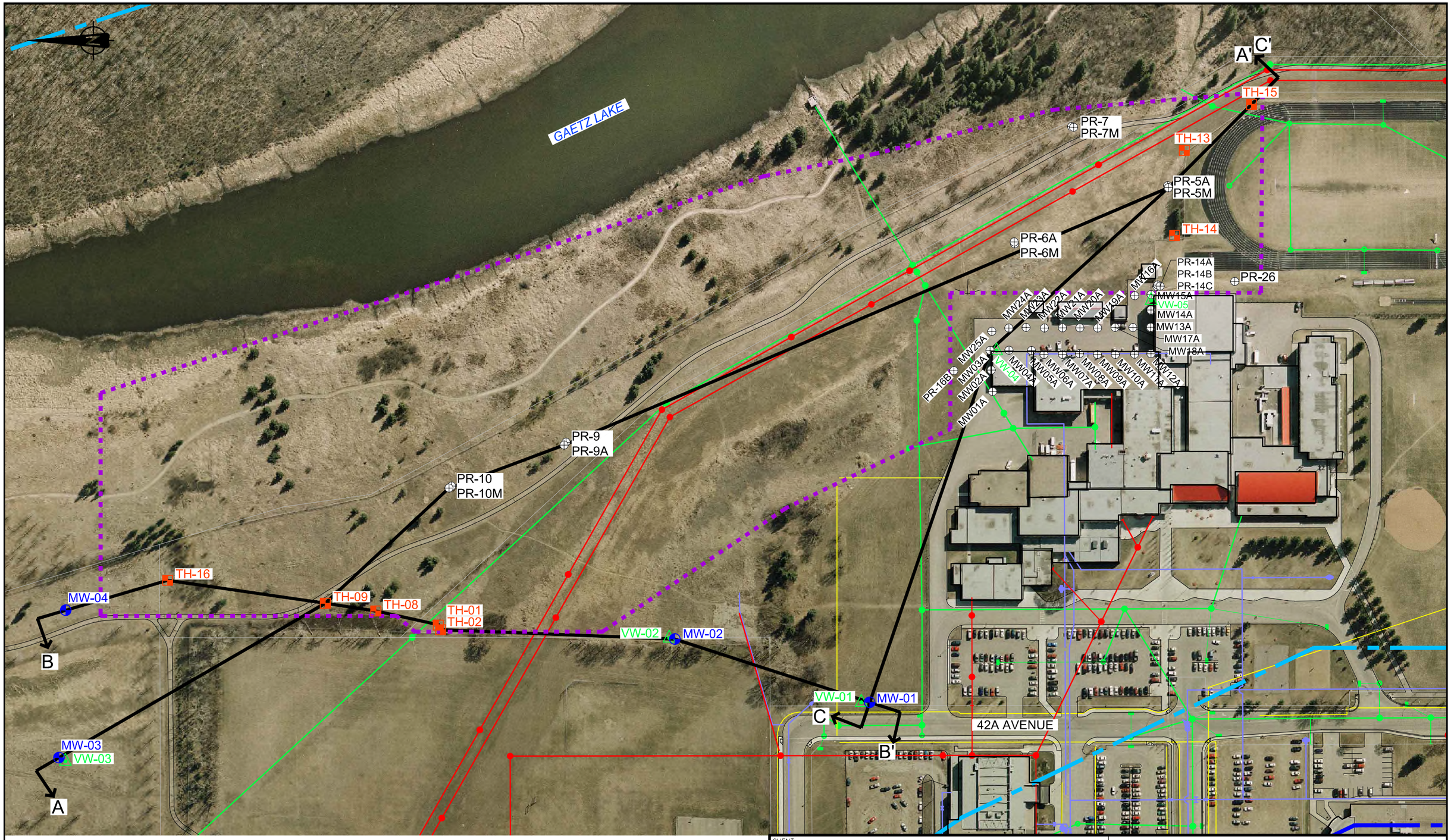
Tetra Tech Canada Inc. 2020. 2019 Groundwater and Soil Vapour Monitoring Report – Lindsay Thurber Comprehensive High School. Prepared for The City of Red Deer. October 2020. Project Number: 704-SWM.SWOP04071-01.002.

XCG Consulting Limited. 2018. Vapour Intrusion Assessment and Environmental Monitoring Report. Prepared for the City of Red Deer's Montfort Landfill.

APPENDIX C

CROSS-SECTIONS (TIAMAT 2014)



SOURCE
2010 ORTHOGRAPHIC IMAGE © COPYRIGHT WITH PERMISSION FROM THE CITY OF RED DEER.

0 20 50 100m
Scale 1:2000

PHASE II TEST LOCATIONS
- MW-## GROUNDWATER MONITORING WELL INSTALLED BY TIAMAT (4)
- TH-## TESTHOLE (7)
- VW-## SOIL VAPOUR MONITORING WELL (5)
- MW-## GROUNDWATER MONITORING WELL INSTALLED BY OTHERS (40)
- ** APPROXIMATE LOCATION - NOT SURVEYED

LEGEND
- HISTORIC WASTE DISPOSAL
- LOT BOUNDARY
- CROSS SECTION LOCATION
- ELECTRICAL
- SANITARY
- STORM
- WATER

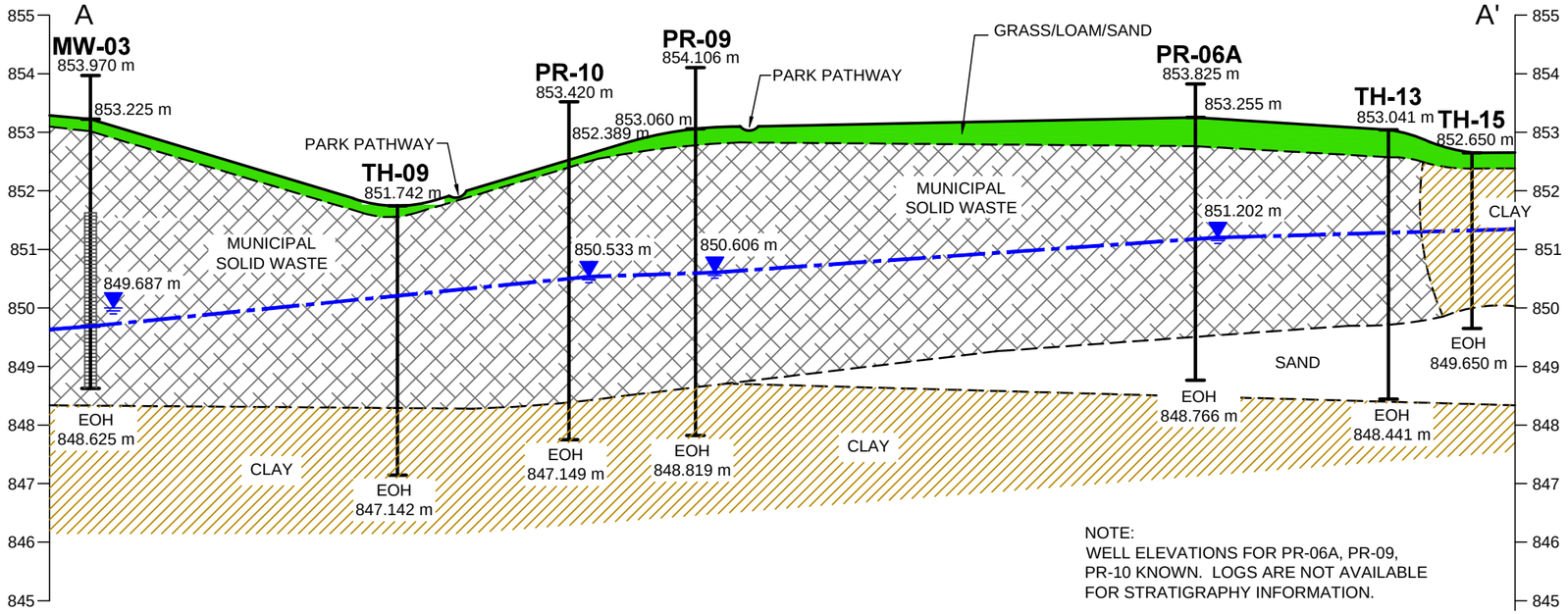
CLIENT: THE CITY OF RED DEER

PROJECT: ENVIRONMENTAL RISK MANAGEMENT PLAN
HISTORIC WASTE DISPOSAL SITE
LINDSAY THURBER COMPREHENSIVE HIGH SCHOOL SITE

TITLE: SITE SHOWING INTERPRETED EXTENT OF WASTE

Tiamat Environmental Consultants Ltd.

SCALE:	DATE:	PROJECT NO.:	FIGURE NO.:
1 : 2000	JAN. 6/13	12-435	FIGURE 2
DRAWN BY: LCH	CHECKED BY: LTM	CAD FILE NO.: ERMP v1.01.dwg	



CLIENT:	THE CITY OF RED DEER
PROJECT:	PHASE II ESA HISTORIC WASTE DISPOSAL SITES LTCHS PTN NE & SE 21-38-27 W4M
TITLE:	CROSS SECTIONS A - A', B - B' AND C - C'

Tiamat Environmental Consultants Ltd.

SCALE:	DATE:	PROJECT NO.:	FIGURE NO.:
1 : 2000	MAR. 14/14	12-435	FIGURE 3
DRAWN BY: LCH	CHECKED BY: LTM	CAD FILE NO.: Section v1.03.dwg	

APPENDIX D

LABORATORY ANALYTICAL REPORTS

CERTIFICATE OF ANALYSIS

Work Order	:	**CG2515200**		
Client	:	**Tetra Tech Canada Inc.**	Laboratory	: ALS Environmental - Calgary
Contact	:	Kara Heckert	Account Manager	: Patryk Wojciak
Address	:	110, 140 Quarry Park Blvd SE Calgary Alberta Canada T2C 3G3	Address	: 2559 29th Street NE Calgary AB Canada T1Y 7B5
Telephone	:	204 954 6832	E-mail	: patryk.wojciak@alsglobal.com
Project	:	SWM.SWOP04071-05.008	Telephone	: +1 403 407 1800
PO	:	SWM.SWOP04071-05.008	Date Samples Received	: 17-Oct-2025 13:40
C-O-C number	:	CORD Lindsay Thurber	Date Analysis Commenced	: 18-Oct-2025
Sampler	:	Willem Verduyn	Issue Date	: 25-Oct-2025 09:47
Site	:	----		
Quote number	:	CG22-EBAE100-0021 City of Red Deer (CORD) Pre-1972 Landfill Sites		
No. of samples received	:	6		
No. of samples analysed	:	6		

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*
Harpreet Chawla	Team Leader - Inorganics	Metals, Calgary, Alberta
Harpreet Chawla	Team Leader - Inorganics	Inorganics, Calgary, Alberta
Joshua Stessun	Laboratory Analyst	Organics, Calgary, Alberta
Katarzyna Glinka	Analyst	Inorganics, Calgary, Alberta
Katrina Tang		Metals, Calgary, Alberta
Pamela Toledo	Laboratory Assistant	Metals, Calgary, Alberta
Shirley Li	Team Leader - Inorganics	Inorganics, Calgary, Alberta
Shirley Li	Team Leader - Inorganics	Metals, Calgary, 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
meq/L	milliequivalents per litre
mg/L	milligrams per litre
pH units	pH units
µg/L	micrograms per litre
µS/cm	microsiemens per centimetre

<: 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)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	MW-02 ----	MW-03 ----	MW-04 ----	BH8 ----	22BH05 ----
					Client sampling date / time	16-Oct-2025 14:10	16-Oct-2025 13:50	16-Oct-2025 13:30	16-Oct-2025 13:40	16-Oct-2025 13:00
						CG2515200-001	CG2515200-002	CG2515200-003	CG2515200-004	CG2515200-005
						Result	Result	Result	Result	Result
Physical Tests										
Alkalinity, bicarbonate (as HCO3)	71-52-3	E290/CG	1.2	mg/L		537	615	625	756	656
Alkalinity, carbonate (as CO3)	3812-32-6	E290/CG	1.0	mg/L		<0.6	<0.6	<0.6	<0.6	<0.6
Alkalinity, hydroxide (as OH)	14280-30-9	E290/CG	1.0	mg/L		<0.3	<0.3	<0.3	<0.3	<0.3
Alkalinity, total (as CaCO3)	----	E290/CG	1.0	mg/L		440	504	512	620	538
Conductivity	----	E100/CG	1.0	µS/cm		1140	946	961	1310	1060
Hardness (as CaCO3), dissolved	----	EC100/CG	0.50	mg/L		485	434	397	640	386
pH	----	E108/CG	0.10	pH units		7.63	7.62	7.75	7.52	7.45
Solids, total dissolved [TDS], calculated	----	EC103/CG	1.0	mg/L		673	599	568	814	663
Anions and Nutrients										
Ammonia, total (as N)	7664-41-7	E298/CG	0.0050	mg/L		0.602	0.932	0.465	0.678	3.38
Chloride	16887-00-6	E235.Cl/CG	0.50	mg/L		93.3	38.4	40.2	52.2	60.0
Fluoride	16984-48-8	E235.F/CG	0.020	mg/L		0.162	0.208	0.284	0.148	0.267
Nitrate (as N)	14797-55-8	E235.NO3/CG	0.020	mg/L		<0.100 DLDS	<0.100 DLDS	<0.100 DLDS	<0.100 DLDS	<0.100 DLDS
Nitrate + Nitrite (as N)	----	EC235.N+N/CG	0.0032	mg/L		<0.112	<0.112	<0.112	<0.112	<0.112
Nitrite (as N)	14797-65-0	E235.NO2/CG	0.010	mg/L		<0.050 DLDS	<0.050 DLDS	<0.050 DLDS	<0.050 DLDS	<0.050 DLDS
Sulfate (as SO4)	14808-79-8	E235.SO4/CG	0.30	mg/L		73.8	<1.50 DLDS	<1.50 DLDS	92.3	<1.50 DLDS
Ion Balance										
Anion sum	----	EC101/CG	0.10	meq/L		13.0	11.2	11.4	15.8	12.5
Cation sum	----	EC101/CG	0.10	meq/L		12.1	12.2	10.7	15.2	12.4
Ion balance (APHA)	----	EC101/CG	0.01	%		-3.59	4.27	-3.17	-1.94	-0.40
Ion balance (cations/anions)	----	EC101/CG	0.010	%		93.1	109	93.9	96.2	99.2

Analytical Results

Sub-Matrix: Water
(Matrix: Water)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	MW-02 ----	MW-03 ----	MW-04 ----	BH8 ----	22BH05 ----
					Client sampling date / time	16-Oct-2025 14:10	16-Oct-2025 13:50	16-Oct-2025 13:30	16-Oct-2025 13:40	16-Oct-2025 13:00
						CG2515200-001	CG2515200-002	CG2515200-003	CG2515200-004	CG2515200-005
						Result	Result	Result	Result	Result
Dissolved Metals										
Aluminum, dissolved	7429-90-5	E421/CG	0.0010	mg/L		<0.0010	1.37	0.0012	<0.0010	0.0018
Antimony, dissolved	7440-36-0	E421/CG	0.00010	mg/L		<0.00010	<0.00010	0.00011	<0.00010	<0.00010
Arsenic, dissolved	7440-38-2	E421/CG	0.00010	mg/L		0.00970	0.0343	0.0136	0.00178	0.0193
Barium, dissolved	7440-39-3	E421/CG	0.00010	mg/L		0.515	1.91	0.933	0.537	0.816
Boron, dissolved	7440-42-8	E421/CG	0.010	mg/L		0.047	0.067	0.049	0.093	0.085
Cadmium, dissolved	7440-43-9	E421/CG	0.0000050	mg/L		0.0000128	0.000232	0.0000123	0.0000549	<0.0000050
Calcium, dissolved	7440-70-2	E421/CG	0.050	mg/L		122	106	99.0	163	89.1
Chromium, dissolved	7440-47-3	E421/CG	0.00050	mg/L		<0.00050	0.00249	<0.00050	<0.00050	<0.00050
Copper, dissolved	7440-50-8	E421/CG	0.00020	mg/L		<0.00020	0.00626	0.00050	0.00050	<0.00020
Iron, dissolved	7439-89-6	E421/CG	0.010	mg/L		6.99	18.7	3.69	0.654	24.0
Lead, dissolved	7439-92-1	E421/CG	0.000050	mg/L		<0.000050	0.00587	<0.000050	<0.000050	<0.000050
Magnesium, dissolved	7439-95-4	E421/CG	0.0050	mg/L		43.9	41.0	36.4	56.5	39.8
Manganese, dissolved	7439-96-5	E421/CG	0.00010	mg/L		0.455	0.549	0.963	1.61	1.68
Mercury, dissolved	7439-97-6	E509/CG	0.0000050	mg/L		<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Nickel, dissolved	7440-02-0	E421/CG	0.00050	mg/L		0.00169	0.00546	0.00244	0.00466	0.00086
Potassium, dissolved	7440-09-7	E421/CG	0.050	mg/L		4.62	6.32	4.07	4.82	6.50
Selenium, dissolved	7782-49-2	E421/CG	0.000050	mg/L		<0.000050	0.000157	0.000194	0.000104	0.000146
Silver, dissolved	7440-22-4	E421/CG	0.000010	mg/L		<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Sodium, dissolved	7440-23-5	E421/CG	0.050	mg/L		46.2	56.7	57.3	49.8	77.0
Uranium, dissolved	7440-61-1	E421/CG	0.000010	mg/L		0.00292	0.000648	0.00140	0.00553	0.000358
Zinc, dissolved	7440-66-6	E421/CG	0.0010	mg/L		0.0010	0.0212	<0.0010	0.0013	<0.0010

Analytical Results

Sub-Matrix: Water
(Matrix: Water)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	MW-02 ----	MW-03 ----	MW-04 ----	BH8 ----	22BH05 ----
					Client sampling date / time	16-Oct-2025 14:10	16-Oct-2025 13:50	16-Oct-2025 13:30	16-Oct-2025 13:40	16-Oct-2025 13:00
						CG2515200-001	CG2515200-002	CG2515200-003	CG2515200-004	CG2515200-005
						Result	Result	Result	Result	Result
Dissolved Metals										
Dissolved mercury filtration location	----	EP509/CG	-	-		Field	Field	Field	Field	Field
Dissolved metals filtration location	----	EP421/CG	-	-		Field	Field	Field	Field	Field
Volatile Organic Compounds										
Benzene	71-43-2	E611E/CG	0.50	µg/L		<0.50	<0.50	<0.50	<0.50	<0.50
Bromobenzene	108-86-1	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Bromochloromethane	74-97-5	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Bromodichloromethane	75-27-4	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Bromoform	75-25-2	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Bromomethane	74-83-9	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Butylbenzene, n-	104-51-8	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Butylbenzene, sec-	135-98-8	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Butylbenzene, tert-	98-06-6	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Carbon tetrachloride	56-23-5	E611E/CG	0.50	µg/L		<0.50	<0.50	<0.50	<0.50	<0.50
Chlorobenzene	108-90-7	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Chloroethane	75-00-3	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Chloroform	67-66-3	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Chloromethane	74-87-3	E611E/CG	5.0	µg/L		<5.0	<5.0	<5.0	<5.0	<5.0
Chlorotoluene, 2-	95-49-8	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Chlorotoluene, 4-	106-43-4	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Cymene, p-	99-87-6	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Dibromo-3-chloropropane, 1,2-	96-12-8	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0

Analytical Results

Sub-Matrix: Water
(Matrix: Water)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	MW-02 ----	MW-03 ----	MW-04 ----	BH8 ----	22BH05 ----
					Client sampling date / time	16-Oct-2025 14:10	16-Oct-2025 13:50	16-Oct-2025 13:30	16-Oct-2025 13:40	16-Oct-2025 13:00
						CG2515200-001	CG2515200-002	CG2515200-003	CG2515200-004	CG2515200-005
						Result	Result	Result	Result	Result
Volatile Organic Compounds										
Dibromochloromethane	124-48-1	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Dibromoethane, 1,2-	106-93-4	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Dibromomethane	74-95-3	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Dichlorobenzene, 1,2-	95-50-1	E611E/CG	0.50	µg/L		<0.50	<0.50	<0.50	<0.50	<0.50
Dichlorobenzene, 1,3-	541-73-1	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Dichlorobenzene, 1,4-	106-46-7	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Dichlorodifluoromethane	75-71-8	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Dichloroethane, 1,1-	75-34-3	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Dichloroethane, 1,2-	107-06-2	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Dichloroethylene, 1,1-	75-35-4	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Dichloroethylene, cis-1,2-	156-59-2	E611E/CG	1.0	µg/L		5.7	2.4	<1.0	6.6	<1.0
Dichloroethylene, trans-1,2-	156-60-5	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Dichloromethane	75-09-2	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	1.6	<1.0
Dichloropropane, 1,2-	78-87-5	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Dichloropropane, 1,3-	142-28-9	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Dichloropropane, 2,2-	594-20-7	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Dichloropropylene, 1,1-	563-58-6	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Dichloropropylene, cis-1,3-	10061-01-5	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Dichloropropylene, cis+trans-1,3-	542-75-6	E611E/CG	1.5	µg/L		<1.5	<1.5	<1.5	<1.5	<1.5
Dichloropropylene, trans-1,3-	10061-02-6	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Ethylbenzene	100-41-4	E611E/CG	0.50	µg/L		<0.50	<0.50	<0.50	<0.50	<0.50

Analytical Results

Sub-Matrix: Water
(Matrix: Water)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	MW-02 ----	MW-03 ----	MW-04 ----	BH8 ----	22BH05 ----
					Client sampling date / time	16-Oct-2025 14:10	16-Oct-2025 13:50	16-Oct-2025 13:30	16-Oct-2025 13:40	16-Oct-2025 13:00
						CG2515200-001	CG2515200-002	CG2515200-003	CG2515200-004	CG2515200-005
						Result	Result	Result	Result	Result
Volatile Organic Compounds										
Hexachlorobutadiene	87-68-3	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Isopropylbenzene	98-82-8	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Methyl-tert-butyl ether [MTBE]	1634-04-4	E611E/CG	0.50	µg/L		<0.50	<0.50	<0.50	<0.50	<0.50
Propylbenzene, n-	103-65-1	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Styrene	100-42-5	E611E/CG	0.50	µg/L		<0.50	<0.50	<0.50	<0.50	<0.50
Tetrachloroethane, 1,1,1,2-	630-20-6	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Tetrachloroethane, 1,1,2,2-	79-34-5	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Tetrachloroethylene	127-18-4	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Toluene	108-88-3	E611E/CG	0.50	µg/L		<0.50	<0.50	<0.50	<0.50	<0.50
Trichlorobenzene, 1,2,3-	87-61-6	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Trichlorobenzene, 1,2,4-	120-82-1	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Trichloroethane, 1,1,1-	71-55-6	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Trichloroethane, 1,1,2-	79-00-5	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Trichloroethylene	79-01-6	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Trichlorofluoromethane	75-69-4	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Trichloropropane, 1,2,3-	96-18-4	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Trimethylbenzene, 1,2,4-	95-63-6	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Trimethylbenzene, 1,3,5-	108-67-8	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Vinyl chloride	75-01-4	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	2.7	<1.0
Xylene, m+p-	179601-23-1	E611E/CG	0.40	µg/L		<0.40	<0.40	<0.40	<0.40	<0.40
Xylene, o-	95-47-6	E611E/CG	0.30	µg/L		<0.30	<0.30	<0.30	<0.30	<0.30

Analytical Results

Sub-Matrix: Water
(Matrix: Water)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	MW-02 ----	MW-03 ----	MW-04 ----	BH8 ----	22BH05 ----
					Client sampling date / time	16-Oct-2025 14:10	16-Oct-2025 13:50	16-Oct-2025 13:30	16-Oct-2025 13:40	16-Oct-2025 13:00
						CG2515200-001	CG2515200-002	CG2515200-003	CG2515200-004	CG2515200-005
						Result	Result	Result	Result	Result
Volatile Organic Compounds										
Xylenes, total	1330-20-7	E611E/CG	0.50	µg/L		<0.50	<0.50	<0.50	<0.50	<0.50
BTEX, total	----	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Trihalomethanes [THMs], total	----	E611E/CG	2.0	µg/L		<2.0	<2.0	<2.0	<2.0	<2.0
Volatile Organic Compounds Surrogates										
Bromofluorobenzene, 4-	460-00-4	E611E/CG	1.0	%		95.4	82.7	84.6	89.2	92.5
Difluorobenzene, 1,4-	540-36-3	E611E/CG	1.0	%		100	99.2	101	97.3	99.3

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

Analytical Results

Sub-Matrix: Water
(Matrix: Water)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	Duplicate ----	----	----	----	----
					Client sampling date / time	16-Oct-2025 00:00	----	----	----	----
						CG2515200-006	----	----	----	----
						Result	----	----	----	----
Physical Tests										
Alkalinity, bicarbonate (as HCO3)	71-52-3	E290/CG	1.2	mg/L		634	----	----	----	----
Alkalinity, carbonate (as CO3)	3812-32-6	E290/CG	1.0	mg/L		<0.6	----	----	----	----
Alkalinity, hydroxide (as OH)	14280-30-9	E290/CG	1.0	mg/L		<0.3	----	----	----	----
Alkalinity, total (as CaCO3)	----	E290/CG	1.0	mg/L		520	----	----	----	----
Conductivity	----	E100/CG	1.0	µS/cm		1060	----	----	----	----
Hardness (as CaCO3), dissolved	----	EC100/CG	0.50	mg/L		386	----	----	----	----
pH	----	E108/CG	0.10	pH units		7.43	----	----	----	----
Solids, total dissolved [TDS], calculated	----	EC103/CG	1.0	mg/L		652	----	----	----	----

Analytical Results

Sub-Matrix: Water
(Matrix: Water)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	Duplicate ----	----	----	----	----
					Client sampling date / time	16-Oct-2025 00:00	----	----	----	----
						CG2515200-006	----	----	----	----
						Result	----	----	----	----
Anions and Nutrients										
Ammonia, total (as N)	7664-41-7	E298/CG	0.0050	mg/L		2.98	----	----	----	----
Chloride	16887-00-6	E235.Cl/CG	0.50	mg/L		60.5	----	----	----	----
Fluoride	16984-48-8	E235.F/CG	0.020	mg/L		0.268	----	----	----	----
Nitrate (as N)	14797-55-8	E235.NO3/CG	0.020	mg/L		<0.100 DLDS	----	----	----	----
Nitrate + Nitrite (as N)	----	EC235.N+N/CG	0.0032	mg/L		<0.112	----	----	----	----
Nitrite (as N)	14797-65-0	E235.NO2/CG	0.010	mg/L		<0.050 DLDS	----	----	----	----
Sulfate (as SO4)	14808-79-8	E235.SO4/CG	0.30	mg/L		<1.50 DLDS	----	----	----	----
Ion Balance										
Anion sum	----	EC101/CG	0.10	meq/L		12.1	----	----	----	----
Cation sum	----	EC101/CG	0.10	meq/L		12.3	----	----	----	----
Ion balance (APHA)	----	EC101/CG	0.01	%		0.82	----	----	----	----
Ion balance (cations/anions)	----	EC101/CG	0.010	%		102	----	----	----	----
Dissolved Metals										
Aluminum, dissolved	7429-90-5	E421/CG	0.0010	mg/L		0.0019	----	----	----	----
Antimony, dissolved	7440-36-0	E421/CG	0.00010	mg/L		<0.00010	----	----	----	----
Arsenic, dissolved	7440-38-2	E421/CG	0.00010	mg/L		0.0197	----	----	----	----
Barium, dissolved	7440-39-3	E421/CG	0.00010	mg/L		0.811	----	----	----	----
Boron, dissolved	7440-42-8	E421/CG	0.010	mg/L		0.085	----	----	----	----
Cadmium, dissolved	7440-43-9	E421/CG	0.0000050	mg/L		<0.0000050	----	----	----	----
Calcium, dissolved	7440-70-2	E421/CG	0.050	mg/L		89.1	----	----	----	----
Chromium, dissolved	7440-47-3	E421/CG	0.00050	mg/L		<0.00050	----	----	----	----

Analytical Results

Sub-Matrix: Water
(Matrix: Water)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID: Duplicate ----	----	----	----	----
					Client sampling date / time: 16-Oct-2025 00:00	----	----	----	----
					CG2515200-006	----	----	----	----
					Result	----	----	----	----
Dissolved Metals									
Copper, dissolved	7440-50-8	E421/CG	0.00020	mg/L	<0.00020	----	----	----	----
Iron, dissolved	7439-89-6	E421/CG	0.010	mg/L	23.8	----	----	----	----
Lead, dissolved	7439-92-1	E421/CG	0.000050	mg/L	<0.000050	----	----	----	----
Magnesium, dissolved	7439-95-4	E421/CG	0.0050	mg/L	39.7	----	----	----	----
Manganese, dissolved	7439-96-5	E421/CG	0.00010	mg/L	1.69	----	----	----	----
Mercury, dissolved	7439-97-6	E509/CG	0.0000050	mg/L	<0.0000050	----	----	----	----
Nickel, dissolved	7440-02-0	E421/CG	0.00050	mg/L	0.00081	----	----	----	----
Potassium, dissolved	7440-09-7	E421/CG	0.050	mg/L	6.79	----	----	----	----
Selenium, dissolved	7782-49-2	E421/CG	0.000050	mg/L	0.000142	----	----	----	----
Silver, dissolved	7440-22-4	E421/CG	0.000010	mg/L	<0.000010	----	----	----	----
Sodium, dissolved	7440-23-5	E421/CG	0.050	mg/L	76.6	----	----	----	----
Uranium, dissolved	7440-61-1	E421/CG	0.000010	mg/L	0.000346	----	----	----	----
Zinc, dissolved	7440-66-6	E421/CG	0.0010	mg/L	<0.0010	----	----	----	----
Dissolved mercury filtration location	----	EP509/CG	-	-	Field	----	----	----	----
Dissolved metals filtration location	----	EP421/CG	-	-	Field	----	----	----	----
Volatile Organic Compounds									
Benzene	71-43-2	E611E/CG	0.50	µg/L	<0.50	----	----	----	----
Bromobenzene	108-86-1	E611E/CG	1.0	µg/L	<1.0	----	----	----	----
Bromochloromethane	74-97-5	E611E/CG	1.0	µg/L	<1.0	----	----	----	----
Bromodichloromethane	75-27-4	E611E/CG	1.0	µg/L	<1.0	----	----	----	----
Bromoform	75-25-2	E611E/CG	1.0	µg/L	<1.0	----	----	----	----

Analytical Results

Sub-Matrix: Water
(Matrix: Water)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	Duplicate ----	----	----	----	----
					Client sampling date / time	16-Oct-2025 00:00	----	----	----	----
					CG2515200-006	----	----	----	----	----
					Result	----	----	----	----	----
Volatile Organic Compounds										
Bromomethane	74-83-9	E611E/CG	1.0	µg/L	<1.0	----	----	----	----
Butylbenzene, n-	104-51-8	E611E/CG	1.0	µg/L	<1.0	----	----	----	----
Butylbenzene, sec-	135-98-8	E611E/CG	1.0	µg/L	<1.0	----	----	----	----
Butylbenzene, tert-	98-06-6	E611E/CG	1.0	µg/L	<1.0	----	----	----	----
Carbon tetrachloride	56-23-5	E611E/CG	0.50	µg/L	<0.50	----	----	----	----
Chlorobenzene	108-90-7	E611E/CG	1.0	µg/L	<1.0	----	----	----	----
Chloroethane	75-00-3	E611E/CG	1.0	µg/L	<1.0	----	----	----	----
Chloroform	67-66-3	E611E/CG	1.0	µg/L	<1.0	----	----	----	----
Chloromethane	74-87-3	E611E/CG	5.0	µg/L	<5.0	----	----	----	----
Chlorotoluene, 2-	95-49-8	E611E/CG	1.0	µg/L	<1.0	----	----	----	----
Chlorotoluene, 4-	106-43-4	E611E/CG	1.0	µg/L	<1.0	----	----	----	----
Cymene, p-	99-87-6	E611E/CG	1.0	µg/L	<1.0	----	----	----	----
Dibromo-3-chloropropane, 1,2-	96-12-8	E611E/CG	1.0	µg/L	<1.0	----	----	----	----
Dibromochloromethane	124-48-1	E611E/CG	1.0	µg/L	<1.0	----	----	----	----
Dibromoethane, 1,2-	106-93-4	E611E/CG	1.0	µg/L	<1.0	----	----	----	----
Dibromomethane	74-95-3	E611E/CG	1.0	µg/L	<1.0	----	----	----	----
Dichlorobenzene, 1,2-	95-50-1	E611E/CG	0.50	µg/L	<0.50	----	----	----	----
Dichlorobenzene, 1,3-	541-73-1	E611E/CG	1.0	µg/L	<1.0	----	----	----	----
Dichlorobenzene, 1,4-	106-46-7	E611E/CG	1.0	µg/L	<1.0	----	----	----	----
Dichlorodifluoromethane	75-71-8	E611E/CG	1.0	µg/L	<1.0	----	----	----	----
Dichloroethane, 1,1-	75-34-3	E611E/CG	1.0	µg/L	<1.0	----	----	----	----

Analytical Results

Sub-Matrix: Water
(Matrix: Water)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	Duplicate ----	----	----	----	----
					Client sampling date / time	16-Oct-2025 00:00	----	----	----	----
					CG2515200-006	----	----	----	----	----
					Result	----	----	----	----	----
Volatile Organic Compounds										
Dichloroethane, 1,2-	107-06-2	E611E/CG	1.0	µg/L	<1.0	----	----	----	----
Dichloroethylene, 1,1-	75-35-4	E611E/CG	1.0	µg/L	<1.0	----	----	----	----
Dichloroethylene, cis-1,2-	156-59-2	E611E/CG	1.0	µg/L	<1.0	----	----	----	----
Dichloroethylene, trans-1,2-	156-60-5	E611E/CG	1.0	µg/L	<1.0	----	----	----	----
Dichloromethane	75-09-2	E611E/CG	1.0	µg/L	<1.0	----	----	----	----
Dichloropropane, 1,2-	78-87-5	E611E/CG	1.0	µg/L	<1.0	----	----	----	----
Dichloropropane, 1,3-	142-28-9	E611E/CG	1.0	µg/L	<1.0	----	----	----	----
Dichloropropane, 2,2-	594-20-7	E611E/CG	1.0	µg/L	<1.0	----	----	----	----
Dichloropropylene, 1,1-	563-58-6	E611E/CG	1.0	µg/L	<1.0	----	----	----	----
Dichloropropylene, cis-1,3-	10061-01-5	E611E/CG	1.0	µg/L	<1.0	----	----	----	----
Dichloropropylene, cis+trans-1,3-	542-75-6	E611E/CG	1.5	µg/L	<1.5	----	----	----	----
Dichloropropylene, trans-1,3-	10061-02-6	E611E/CG	1.0	µg/L	<1.0	----	----	----	----
Ethylbenzene	100-41-4	E611E/CG	0.50	µg/L	<0.50	----	----	----	----
Hexachlorobutadiene	87-68-3	E611E/CG	1.0	µg/L	<1.0	----	----	----	----
Isopropylbenzene	98-82-8	E611E/CG	1.0	µg/L	<1.0	----	----	----	----
Methyl-tert-butyl ether [MTBE]	1634-04-4	E611E/CG	0.50	µg/L	<0.50	----	----	----	----
Propylbenzene, n-	103-65-1	E611E/CG	1.0	µg/L	<1.0	----	----	----	----
Styrene	100-42-5	E611E/CG	0.50	µg/L	<0.50	----	----	----	----
Tetrachloroethane, 1,1,1,2-	630-20-6	E611E/CG	1.0	µg/L	<1.0	----	----	----	----
Tetrachloroethane, 1,1,2,2-	79-34-5	E611E/CG	1.0	µg/L	<1.0	----	----	----	----
Tetrachloroethylene	127-18-4	E611E/CG	1.0	µg/L	<1.0	----	----	----	----

Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	Duplicate ----	----	----	----	----
					Client sampling date / time	16-Oct-2025 00:00	----	----	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit		CG2515200-006	----	----	----	----
						Result	----	----	----	----
Volatile Organic Compounds										
Toluene	108-88-3	E611E/CG	0.50	µg/L		<0.50	----	----	----	----
Trichlorobenzene, 1,2,3-	87-61-6	E611E/CG	1.0	µg/L		<1.0	----	----	----	----
Trichlorobenzene, 1,2,4-	120-82-1	E611E/CG	1.0	µg/L		<1.0	----	----	----	----
Trichloroethane, 1,1,1-	71-55-6	E611E/CG	1.0	µg/L		<1.0	----	----	----	----
Trichloroethane, 1,1,2-	79-00-5	E611E/CG	1.0	µg/L		<1.0	----	----	----	----
Trichloroethylene	79-01-6	E611E/CG	1.0	µg/L		<1.0	----	----	----	----
Trichlorofluoromethane	75-69-4	E611E/CG	1.0	µg/L		<1.0	----	----	----	----
Trichloropropane, 1,2,3-	96-18-4	E611E/CG	1.0	µg/L		<1.0	----	----	----	----
Trimethylbenzene, 1,2,4-	95-63-6	E611E/CG	1.0	µg/L		<1.0	----	----	----	----
Trimethylbenzene, 1,3,5-	108-67-8	E611E/CG	1.0	µg/L		<1.0	----	----	----	----
Vinyl chloride	75-01-4	E611E/CG	1.0	µg/L		<1.0	----	----	----	----
Xylene, m+p-	179601-23-1	E611E/CG	0.40	µg/L		<0.40	----	----	----	----
Xylene, o-	95-47-6	E611E/CG	0.30	µg/L		<0.30	----	----	----	----
Xylenes, total	1330-20-7	E611E/CG	0.50	µg/L		<0.50	----	----	----	----
BTEX, total	----	E611E/CG	1.0	µg/L		<1.0	----	----	----	----
Trihalomethanes [THMs], total	----	E611E/CG	2.0	µg/L		<2.0	----	----	----	----
Volatile Organic Compounds Surrogates										
Bromofluorobenzene, 4-	460-00-4	E611E/CG	1.0	%		94.4	----	----	----	----
Difluorobenzene, 1,4-	540-36-3	E611E/CG	1.0	%		96.0	----	----	----	----

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

ALS Canada Ltd.

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right partner.

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **CG2515200**	Page	: 1 of 16
Client	: **Tetra Tech Canada Inc.**	Laboratory	: ALS Environmental - Calgary
Contact	: Kara Heckert	Account Manager	: Patryk Wojciak
Address	: 110, 140 Quarry Park Blvd SE Calgary AB Canada T2C 3G3	Address	: 2559 29th Street NE Calgary, Alberta Canada T1Y 7B5
Telephone	: 204 954 6832	Telephone	: +1 403 407 1800
Project	: SWM.SWOP04071-05.008	Date Samples Received	: 17-Oct-2025 13:40
PO	: SWM.SWOP04071-05.008	Issue Date	: 25-Oct-2025 09:47
C-O-C number	: CORD Lindsay Thurber		
Sampler	: Willem Verduyn		
Site	: ----		
Quote number	: CG22-EBAE100-0021 City of Red Deer (CORD) Pre-1972 Landfill Sites		
No. of samples received	: 6		
No. of samples analysed	: 6		

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
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) 22BH05	E298	16-Oct-2025	19-Oct-2025	28 days	3 days	✓	19-Oct-2025	28 days	3 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) BH8	E298	16-Oct-2025	19-Oct-2025	28 days	3 days	✓	19-Oct-2025	28 days	3 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) Duplicate	E298	16-Oct-2025	19-Oct-2025	28 days	3 days	✓	19-Oct-2025	28 days	3 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) MW-02	E298	16-Oct-2025	19-Oct-2025	28 days	3 days	✓	19-Oct-2025	28 days	3 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) MW-03	E298	16-Oct-2025	19-Oct-2025	28 days	3 days	✓	19-Oct-2025	28 days	3 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) MW-04	E298	16-Oct-2025	19-Oct-2025	28 days	3 days	✓	19-Oct-2025	28 days	3 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE 22BH05	E235.Cl	16-Oct-2025	18-Oct-2025	28 days	2 days	✓	18-Oct-2025	28 days	2 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 : Chloride in Water by IC										
HDPE BH8	E235.Cl	16-Oct-2025	18-Oct-2025	28 days	2 days	✓	18-Oct-2025	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE Duplicate	E235.Cl	16-Oct-2025	18-Oct-2025	28 days	2 days	✓	18-Oct-2025	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE MW-02	E235.Cl	16-Oct-2025	18-Oct-2025	28 days	2 days	✓	18-Oct-2025	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE MW-03	E235.Cl	16-Oct-2025	18-Oct-2025	28 days	2 days	✓	18-Oct-2025	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE MW-04	E235.Cl	16-Oct-2025	18-Oct-2025	28 days	2 days	✓	18-Oct-2025	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE 22BH05	E235.F	16-Oct-2025	18-Oct-2025	28 days	2 days	✓	18-Oct-2025	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE BH8	E235.F	16-Oct-2025	18-Oct-2025	28 days	2 days	✓	18-Oct-2025	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE Duplicate	E235.F	16-Oct-2025	18-Oct-2025	28 days	2 days	✓	18-Oct-2025	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE MW-02	E235.F	16-Oct-2025	18-Oct-2025	28 days	2 days	✓	18-Oct-2025	28 days	2 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 MW-03	E235.F	16-Oct-2025	18-Oct-2025	28 days	2 days	✓	18-Oct-2025	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE MW-04	E235.F	16-Oct-2025	18-Oct-2025	28 days	2 days	✓	18-Oct-2025	28 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE 22BH05	E235.NO3	16-Oct-2025	18-Oct-2025	3 days	2 days	✓	18-Oct-2025	3 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE BH8	E235.NO3	16-Oct-2025	18-Oct-2025	3 days	2 days	✓	18-Oct-2025	3 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE Duplicate	E235.NO3	16-Oct-2025	18-Oct-2025	3 days	2 days	✓	18-Oct-2025	3 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE MW-02	E235.NO3	16-Oct-2025	18-Oct-2025	3 days	2 days	✓	18-Oct-2025	3 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE MW-03	E235.NO3	16-Oct-2025	18-Oct-2025	3 days	2 days	✓	18-Oct-2025	3 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE MW-04	E235.NO3	16-Oct-2025	18-Oct-2025	3 days	2 days	✓	18-Oct-2025	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE 22BH05	E235.NO2	16-Oct-2025	18-Oct-2025	3 days	2 days	✓	18-Oct-2025	3 days	2 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		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Anions and Nutrients : Nitrite in Water by IC										
HDPE										
BH8	E235.NO2	16-Oct-2025	18-Oct-2025	3 days	2 days	✓	18-Oct-2025	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE										
Duplicate	E235.NO2	16-Oct-2025	18-Oct-2025	3 days	2 days	✓	18-Oct-2025	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE										
MW-02	E235.NO2	16-Oct-2025	18-Oct-2025	3 days	2 days	✓	18-Oct-2025	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE										
MW-03	E235.NO2	16-Oct-2025	18-Oct-2025	3 days	2 days	✓	18-Oct-2025	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE										
MW-04	E235.NO2	16-Oct-2025	18-Oct-2025	3 days	2 days	✓	18-Oct-2025	3 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE										
22BH05	E235.SO4	16-Oct-2025	18-Oct-2025	28 days	2 days	✓	18-Oct-2025	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE										
BH8	E235.SO4	16-Oct-2025	18-Oct-2025	28 days	2 days	✓	18-Oct-2025	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE										
Duplicate	E235.SO4	16-Oct-2025	18-Oct-2025	28 days	2 days	✓	18-Oct-2025	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE										
MW-02	E235.SO4	16-Oct-2025	18-Oct-2025	28 days	2 days	✓	18-Oct-2025	28 days	2 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 : Sulfate in Water by IC										
HDPE MW-03	E235.SO4	16-Oct-2025	18-Oct-2025	28 days	2 days	✓	18-Oct-2025	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE MW-04	E235.SO4	16-Oct-2025	18-Oct-2025	28 days	2 days	✓	18-Oct-2025	28 days	2 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid) 22BH05	E509	16-Oct-2025	21-Oct-2025	28 days	5 days	✓	21-Oct-2025	28 days	5 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid) BH8	E509	16-Oct-2025	21-Oct-2025	28 days	5 days	✓	21-Oct-2025	28 days	5 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid) Duplicate	E509	16-Oct-2025	21-Oct-2025	28 days	5 days	✓	21-Oct-2025	28 days	5 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid) MW-02	E509	16-Oct-2025	21-Oct-2025	28 days	5 days	✓	21-Oct-2025	28 days	5 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid) MW-03	E509	16-Oct-2025	21-Oct-2025	28 days	5 days	✓	21-Oct-2025	28 days	5 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid) MW-04	E509	16-Oct-2025	21-Oct-2025	28 days	5 days	✓	21-Oct-2025	28 days	5 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) 22BH05	E421	16-Oct-2025	20-Oct-2025	180 days	4 days	✓	21-Oct-2025	180 days	4 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
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) BH8	E421	16-Oct-2025	20-Oct-2025	180 days	4 days	✓	21-Oct-2025	180 days	4 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) MW-02	E421	16-Oct-2025	20-Oct-2025	180 days	4 days	✓	21-Oct-2025	180 days	4 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) MW-03	E421	16-Oct-2025	20-Oct-2025	180 days	4 days	✓	21-Oct-2025	180 days	4 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) MW-04	E421	16-Oct-2025	20-Oct-2025	180 days	4 days	✓	21-Oct-2025	180 days	4 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) Duplicate	E421	16-Oct-2025	20-Oct-2025	180 days	5 days	✓	21-Oct-2025	180 days	5 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE 22BH05	E290	16-Oct-2025	18-Oct-2025	14 days	2 days	✓	18-Oct-2025	14 days	2 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE BH8	E290	16-Oct-2025	18-Oct-2025	14 days	2 days	✓	18-Oct-2025	14 days	2 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE Duplicate	E290	16-Oct-2025	18-Oct-2025	14 days	2 days	✓	18-Oct-2025	14 days	2 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE MW-02	E290	16-Oct-2025	18-Oct-2025	14 days	2 days	✓	18-Oct-2025	14 days	2 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
Physical Tests : Alkalinity Species by Titration										
HDPE MW-03	E290	16-Oct-2025	18-Oct-2025	14 days	2 days	✓	18-Oct-2025	14 days	2 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE MW-04	E290	16-Oct-2025	18-Oct-2025	14 days	2 days	✓	18-Oct-2025	14 days	2 days	✓
Physical Tests : Conductivity in Water										
HDPE 22BH05	E100	16-Oct-2025	18-Oct-2025	28 days	2 days	✓	18-Oct-2025	28 days	2 days	✓
Physical Tests : Conductivity in Water										
HDPE BH8	E100	16-Oct-2025	18-Oct-2025	28 days	2 days	✓	18-Oct-2025	28 days	2 days	✓
Physical Tests : Conductivity in Water										
HDPE Duplicate	E100	16-Oct-2025	18-Oct-2025	28 days	2 days	✓	18-Oct-2025	28 days	2 days	✓
Physical Tests : Conductivity in Water										
HDPE MW-02	E100	16-Oct-2025	18-Oct-2025	28 days	2 days	✓	18-Oct-2025	28 days	2 days	✓
Physical Tests : Conductivity in Water										
HDPE MW-03	E100	16-Oct-2025	18-Oct-2025	28 days	2 days	✓	18-Oct-2025	28 days	2 days	✓
Physical Tests : Conductivity in Water										
HDPE MW-04	E100	16-Oct-2025	18-Oct-2025	28 days	2 days	✓	18-Oct-2025	28 days	2 days	✓
Physical Tests : pH by Meter										
HDPE MW-02	E108	16-Oct-2025	18-Oct-2025	0.25 hrs	45 hrs	× EHTR-FM	18-Oct-2025	0.25 hrs	45 hrs	× EHTR-FM

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		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Physical Tests : pH by Meter										
HDPE										
MW-03	E108	16-Oct-2025	18-Oct-2025	0.25 hrs	45 hrs	× EHTR-FM	18-Oct-2025	0.25 hrs	45 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE										
22BH05	E108	16-Oct-2025	18-Oct-2025	0.25 hrs	46 hrs	× EHTR-FM	18-Oct-2025	0.25 hrs	46 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE										
BH8	E108	16-Oct-2025	18-Oct-2025	0.25 hrs	46 hrs	× EHTR-FM	18-Oct-2025	0.25 hrs	46 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE										
MW-04	E108	16-Oct-2025	18-Oct-2025	0.25 hrs	46 hrs	× EHTR-FM	18-Oct-2025	0.25 hrs	46 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE										
Duplicate	E108	16-Oct-2025	18-Oct-2025	0.25 hrs	59 hrs	× EHTR-FM	18-Oct-2025	0.25 hrs	59 hrs	× EHTR-FM
Volatile Organic Compounds : VOCs (Prairies List) by Headspace GC-MS										
Glass vial (sodium bisulfate)										
22BH05	E611E	16-Oct-2025	25-Oct-2025	14 days	9 days	✓	25-Oct-2025	14 days	9 days	✓
Volatile Organic Compounds : VOCs (Prairies List) by Headspace GC-MS										
Glass vial (sodium bisulfate)										
BH8	E611E	16-Oct-2025	25-Oct-2025	14 days	9 days	✓	25-Oct-2025	14 days	9 days	✓
Volatile Organic Compounds : VOCs (Prairies List) by Headspace GC-MS										
Glass vial (sodium bisulfate)										
Duplicate	E611E	16-Oct-2025	25-Oct-2025	14 days	9 days	✓	25-Oct-2025	14 days	9 days	✓
Volatile Organic Compounds : VOCs (Prairies List) by Headspace GC-MS										
Glass vial (sodium bisulfate)										
MW-02	E611E	16-Oct-2025	25-Oct-2025	14 days	9 days	✓	25-Oct-2025	14 days	9 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) MW-03	E611E	16-Oct-2025	25-Oct-2025	14 days	9 days	✓	25-Oct-2025	14 days	9 days	✓
Volatile Organic Compounds : VOCs (Prairies List) by Headspace GC-MS										
Glass vial (sodium bisulfate) MW-04	E611E	16-Oct-2025	25-Oct-2025	14 days	9 days	✓	25-Oct-2025	14 days	9 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)							
Conductivity in Water	E100	2284352	1	18	5.5	5.0	✓
pH by Meter	E108	2284351	1	18	5.5	5.0	✓
Chloride in Water by IC	E235.Cl	2284376	1	20	5.0	5.0	✓
Fluoride in Water by IC	E235.F	2284373	1	20	5.0	5.0	✓
Nitrite in Water by IC	E235.NO2	2284375	1	20	5.0	5.0	✓
Nitrate in Water by IC	E235.NO3	2284374	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	2284377	1	20	5.0	5.0	✓
Alkalinity Species by Titration	E290	2284353	1	20	5.0	5.0	✓
Ammonia by Fluorescence	E298	2285179	1	20	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	2284448	1	20	5.0	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	2287549	2	22	9.0	5.0	✓
VOCs (Prairies List) by Headspace GC-MS	E611E	2298662	1	12	8.3	5.0	✓
Laboratory Control Samples (LCS)							
Conductivity in Water	E100	2284352	1	18	5.5	5.0	✓
pH by Meter	E108	2284351	1	18	5.5	5.0	✓
Chloride in Water by IC	E235.Cl	2284376	1	20	5.0	5.0	✓
Fluoride in Water by IC	E235.F	2284373	1	20	5.0	5.0	✓
Nitrite in Water by IC	E235.NO2	2284375	1	20	5.0	5.0	✓
Nitrate in Water by IC	E235.NO3	2284374	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	2284377	1	20	5.0	5.0	✓
Alkalinity Species by Titration	E290	2284353	1	20	5.0	5.0	✓
Ammonia by Fluorescence	E298	2285179	1	20	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	2284448	1	20	5.0	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	2287549	2	22	9.0	5.0	✓
VOCs (Prairies List) by Headspace GC-MS	E611E	2298662	1	12	8.3	5.0	✓
Method Blanks (MB)							
Conductivity in Water	E100	2284352	1	18	5.5	5.0	✓
Chloride in Water by IC	E235.Cl	2284376	1	20	5.0	5.0	✓
Fluoride in Water by IC	E235.F	2284373	1	20	5.0	5.0	✓
Nitrite in Water by IC	E235.NO2	2284375	1	20	5.0	5.0	✓
Nitrate in Water by IC	E235.NO3	2284374	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	2284377	1	20	5.0	5.0	✓
Alkalinity Species by Titration	E290	2284353	1	20	5.0	5.0	✓
Ammonia by Fluorescence	E298	2285179	1	20	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	2284448	1	20	5.0	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) - Continued							
Dissolved Mercury in Water by CVAAS	E509	2287549	2	22	9.0	5.0	✓
VOCs (Prairies List) by Headspace GC-MS	E611E	2298662	1	12	8.3	5.0	✓
Matrix Spikes (MS)							
Chloride in Water by IC	E235.Cl	2284376	1	20	5.0	5.0	✓
Fluoride in Water by IC	E235.F	2284373	1	20	5.0	5.0	✓
Nitrite in Water by IC	E235.NO2	2284375	1	20	5.0	5.0	✓
Nitrate in Water by IC	E235.NO3	2284374	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	2284377	1	20	5.0	5.0	✓
Ammonia by Fluorescence	E298	2285179	1	20	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	2284448	1	20	5.0	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	2287549	2	22	9.0	5.0	✓
VOCs (Prairies List) by Headspace GC-MS	E611E	2298662	1	12	8.3	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 - Calgary	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 - Calgary	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 - Calgary	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 - Calgary	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 - Calgary	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 - Calgary	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 - Calgary	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 - Calgary	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 - Calgary	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)

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Dissolved Metals in Water by CRC ICPMS	E421 ALS Environmental - Calgary	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 - Calgary	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.
VOCs (Prairies List) by Headspace GC-MS	E611E ALS Environmental - Calgary	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 ALS Environmental - Calgary	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 - Calgary	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 - Calgary	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 - Calgary	Water	EPA 300.0	Nitrate and Nitrite (as N) is a calculated parameter. Nitrate and Nitrite (as N) = Nitrite (as N) + Nitrate (as N).

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 ALS Environmental - Calgary	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Dissolved Metals Water Filtration	EP421 ALS Environmental - Calgary	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HNO3.
Dissolved Mercury Water Filtration	EP509 ALS Environmental - Calgary	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 - Calgary	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 a GC-MS-FID.

QUALITY CONTROL REPORT

Work Order	: **CG2515200**	Page	: 1 of 16
Client	: Tetra Tech Canada Inc.	Laboratory	: ALS Environmental - Calgary
Contact	: Kara Heckert	Account Manager	: Patryk Wojciak
Address	: 110, 140 Quarry Park Blvd SE Calgary AB Canada T2C 3G3	Address	: 2559 29th Street NE Calgary, Alberta Canada T1Y 7B5
Telephone	: 204 954 6832	Telephone	: +1 403 407 1800
Project	: SWM.SWOP04071-05.008	Date Samples Received	: 17-Oct-2025 13:40
PO	: SWM.SWOP04071-05.008	Date Analysis Commenced	: 18-Oct-2025
C-O-C number	: CORD Lindsay Thurber	Issue Date	: 25-Oct-2025 09:47
Sampler	: Willem Verduyn		
Site	: ----		
Quote number	: CG22-EBAE100-0021 City of Red Deer (CORD) Pre-1972 Landfill Sites		
No. of samples received	: 6		
No. of samples analysed	: 6		

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*
Harpreet Chawla	Team Leader - Inorganics	Calgary Inorganics, Calgary, Alberta
Harpreet Chawla	Team Leader - Inorganics	Calgary Metals, Calgary, Alberta
Joshua Stessun	Laboratory Analyst	Calgary Organics, Calgary, Alberta
Katarzyna Glinka	Analyst	Calgary Inorganics, Calgary, Alberta
Katrina Tang		Calgary Metals, Calgary, Alberta
Pamela Toledo	Laboratory Assistant	Calgary Metals, Calgary, Alberta
Shirley Li	Team Leader - Inorganics	Calgary Inorganics, Calgary, Alberta
Shirley Li	Team Leader - Inorganics	Calgary Metals, Calgary, 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: 2284351)											
CG2515098-001	Anonymous	pH	----	E108	0.10	pH units	8.18	8.25	0.852%	4%	----
Physical Tests (QC Lot: 2284352)											
CG2515098-001	Anonymous	Conductivity	----	E100	2.0	µS/cm	321	324	0.930%	10%	----
Physical Tests (QC Lot: 2284353)											
CG2515098-001	Anonymous	Alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	169	166	1.97%	20%	----
Anions and Nutrients (QC Lot: 2284373)											
CG2515200-001	MW-02	Fluoride	16984-48-8	E235.F	0.100	mg/L	0.162	0.161	0.001	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 2284374)											
CG2515200-001	MW-02	Nitrate (as N)	14797-55-8	E235.NO3	0.100	mg/L	<0.100	<0.100	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 2284375)											
CG2515200-001	MW-02	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: 2284376)											
CG2515200-001	MW-02	Chloride	16887-00-6	E235.Cl	2.50	mg/L	93.3	93.2	0.0871%	20%	----
Anions and Nutrients (QC Lot: 2284377)											
CG2515200-001	MW-02	Sulfate (as SO4)	14808-79-8	E235.SO4	1.50	mg/L	73.8	73.8	0.0000352%	20%	----
Anions and Nutrients (QC Lot: 2285179)											
CG2514908-001	Anonymous	Ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.220	0.184	17.5%	20%	----
Dissolved Metals (QC Lot: 2284448)											
CG2515178-001	Anonymous	Aluminum, dissolved	7429-90-5	E421	0.0020	mg/L	0.0058	0.0084	0.0027	Diff <2x LOR	----
		Antimony, dissolved	7440-36-0	E421	0.00020	mg/L	0.00064	0.00062	0.00001	Diff <2x LOR	----
		Arsenic, dissolved	7440-38-2	E421	0.00020	mg/L	0.00080	0.00083	0.00003	Diff <2x LOR	----
		Barium, dissolved	7440-39-3	E421	0.00020	mg/L	0.141	0.141	0.253%	20%	----
		Boron, dissolved	7440-42-8	E421	0.020	mg/L	0.267	0.275	2.85%	20%	----
		Cadmium, dissolved	7440-43-9	E421	0.0000100	mg/L	0.0000127	0.0000116	0.0000011	Diff <2x LOR	----
		Calcium, dissolved	7440-70-2	E421	0.100	mg/L	31.8	32.3	1.66%	20%	----
		Chromium, dissolved	7440-47-3	E421	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		Copper, dissolved	7440-50-8	E421	0.00040	mg/L	0.00222	0.00230	0.00008	Diff <2x LOR	----
		Iron, dissolved	7439-89-6	E421	0.020	mg/L	0.065	0.065	0.0003	Diff <2x LOR	----
		Lead, dissolved	7439-92-1	E421	0.000100	mg/L	<0.000100	<0.000100	0	Diff <2x LOR	----
		Magnesium, dissolved	7439-95-4	E421	0.0100	mg/L	41.9	42.7	1.88%	20%	----

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*
Dissolved Metals (QC Lot: 2284448) - continued											
CG2515178-001	Anonymous	Manganese, dissolved	7439-96-5	E421	0.00020	mg/L	0.0452	0.0460	1.64%	20%	----
		Nickel, dissolved	7440-02-0	E421	0.00100	mg/L	0.00212	0.00205	0.00007	Diff <2x LOR	----
		Potassium, dissolved	7440-09-7	E421	2.00	mg/L	<2.00	<2.00	0	Diff <2x LOR	----
		Selenium, dissolved	7782-49-2	E421	0.000100	mg/L	0.000435	0.000400	0.000035	Diff <2x LOR	----
		Silver, dissolved	7440-22-4	E421	0.000020	mg/L	<0.000020	<0.000020	0	Diff <2x LOR	----
		Sodium, dissolved	7440-23-5	E421	0.100	mg/L	333	337	0.992%	20%	----
		Uranium, dissolved	7440-61-1	E421	0.000020	mg/L	0.0193	0.0202	4.28%	20%	----
		Zinc, dissolved	7440-66-6	E421	0.0020	mg/L	<0.0020	<0.0020	0	Diff <2x LOR	----
Dissolved Metals (QC Lot: 2287548)											
CG2515008-001	Anonymous	Mercury, dissolved	7439-97-6	E509	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
Dissolved Metals (QC Lot: 2287549)											
CG2515200-005	22BH05	Mercury, dissolved	7439-97-6	E509	0.0000050	mg/L	<0.0000050	0.0000059	0.0000009	Diff <2x LOR	----
Volatile Organic Compounds (QC Lot: 2298662)											
CG2515185-001	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	----

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: 2298662) - continued											
CG2515185-001	Anonymous	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	----
		Trimethylbenzene, 1,2,4-	95-63-6	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: 2298662) - continued											
CG2515185-001	Anonymous	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	----

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: 2284352)						
Conductivity	----	E100	1	µS/cm	<1.0	----
Physical Tests (QCLot: 2284353)						
Alkalinity, total (as CaCO3)	----	E290	1	mg/L	<1.0	----
Anions and Nutrients (QCLot: 2284373)						
Fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 2284374)						
Nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 2284375)						
Nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	<0.010	----
Anions and Nutrients (QCLot: 2284376)						
Chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 2284377)						
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 2285179)						
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Dissolved Metals (QCLot: 2284448)						
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	----
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	----
Chromium, dissolved	7440-47-3	E421	0.0005	mg/L	<0.00050	----
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	----
Magnesium, dissolved	7439-95-4	E421	0.005	mg/L	<0.0050	----
Manganese, dissolved	7439-96-5	E421	0.0001	mg/L	<0.00010	----
Nickel, dissolved	7440-02-0	E421	0.0005	mg/L	<0.00050	----
Potassium, dissolved	7440-09-7	E421	0.05	mg/L	<0.050	----
Selenium, dissolved	7782-49-2	E421	0.00005	mg/L	<0.000050	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Dissolved Metals (QCLot: 2284448) - continued						
Silver, dissolved	7440-22-4	E421	0.00001	mg/L	<0.000010	----
Sodium, dissolved	7440-23-5	E421	0.05	mg/L	<0.050	----
Uranium, dissolved	7440-61-1	E421	0.00001	mg/L	<0.000010	----
Zinc, dissolved	7440-66-6	E421	0.001	mg/L	<0.0010	----
Dissolved Metals (QCLot: 2287548)						
Mercury, dissolved	7439-97-6	E509	0.000005	mg/L	<0.0000050	----
Dissolved Metals (QCLot: 2287549)						
Mercury, dissolved	7439-97-6	E509	0.000005	mg/L	<0.0000050	----
Volatile Organic Compounds (QCLot: 2298662)						
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	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Volatile Organic Compounds (QCLot: 2298662) - continued						
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	----
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	----

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	Target Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 2284351)									
pH	----	E108	----	pH units	7 pH units	101	98.0	102	----
Physical Tests (QCLot: 2284352)									
Conductivity	----	E100	1	µS/cm	147 µS/cm	93.9	90.0	110	----
Physical Tests (QCLot: 2284353)									
Alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	102	85.0	115	----
Anions and Nutrients (QCLot: 2284373)									
Fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	105	90.0	110	----
Anions and Nutrients (QCLot: 2284374)									
Nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	2.5 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 2284375)									
Nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	0.5 mg/L	103	90.0	110	----
Anions and Nutrients (QCLot: 2284376)									
Chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 2284377)									
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	100	90.0	110	----
Anions and Nutrients (QCLot: 2285179)									
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	98.5	85.0	115	----
Dissolved Metals (QCLot: 2284448)									
Aluminum, dissolved	7429-90-5	E421	0.001	mg/L	2 mg/L	94.5	80.0	120	----
Antimony, dissolved	7440-36-0	E421	0.0001	mg/L	1 mg/L	91.3	80.0	120	----
Arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	1 mg/L	96.8	80.0	120	----
Barium, dissolved	7440-39-3	E421	0.0001	mg/L	0.25 mg/L	97.4	80.0	120	----
Boron, dissolved	7440-42-8	E421	0.01	mg/L	1 mg/L	87.4	80.0	120	----
Cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	0.1 mg/L	95.0	80.0	120	----
Calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	93.6	80.0	120	----
Chromium, dissolved	7440-47-3	E421	0.0005	mg/L	0.25 mg/L	97.7	80.0	120	----
Copper, dissolved	7440-50-8	E421	0.0002	mg/L	0.25 mg/L	93.4	80.0	120	----
Iron, dissolved	7439-89-6	E421	0.01	mg/L	1 mg/L	112	80.0	120	----
Lead, dissolved	7439-92-1	E421	0.00005	mg/L	0.5 mg/L	93.5	80.0	120	----
Magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	95.8	80.0	120	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
					Target Concentration	LCS	Low	High	Qualifier
Dissolved Metals (QCLot: 2284448) - continued									
Manganese, dissolved	7439-96-5	E421	0.0001	mg/L	0.25 mg/L	95.6	80.0	120	----
Nickel, dissolved	7440-02-0	E421	0.0005	mg/L	0.5 mg/L	94.2	80.0	120	----
Potassium, dissolved	7440-09-7	E421	0.05	mg/L	50 mg/L	95.9	80.0	120	----
Selenium, dissolved	7782-49-2	E421	0.00005	mg/L	1 mg/L	94.1	80.0	120	----
Silver, dissolved	7440-22-4	E421	0.00001	mg/L	0.1 mg/L	89.7	80.0	120	----
Sodium, dissolved	7440-23-5	E421	0.05	mg/L	50 mg/L	93.9	80.0	120	----
Uranium, dissolved	7440-61-1	E421	0.00001	mg/L	0.005 mg/L	98.4	80.0	120	----
Zinc, dissolved	7440-66-6	E421	0.001	mg/L	0.5 mg/L	91.0	80.0	120	----
Mercury, dissolved	7439-97-6	E509	0.000005	mg/L	0 mg/L	105	80.0	120	----
Mercury, dissolved	7439-97-6	E509	0.000005	mg/L	0 mg/L	97.0	80.0	120	----
Volatile Organic Compounds (QCLot: 2298662)									
Benzene	71-43-2	E611E	0.5	µg/L	100 µg/L	102	70.0	130	----
Bromobenzene	108-86-1	E611E	1	µg/L	100 µg/L	104	70.0	130	----
Bromochloromethane	74-97-5	E611E	1	µg/L	100 µg/L	113	70.0	130	----
Bromodichloromethane	75-27-4	E611E	1	µg/L	100 µg/L	113	70.0	130	----
Bromoform	75-25-2	E611E	1	µg/L	100 µg/L	99.4	70.0	130	----
Bromomethane	74-83-9	E611E	1	µg/L	100 µg/L	112	60.0	140	----
Butylbenzene, n-	104-51-8	E611E	1	µg/L	100 µg/L	92.6	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	97.5	70.0	130	----
Carbon tetrachloride	56-23-5	E611E	0.5	µg/L	100 µg/L	114	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	99.6	60.0	140	----
Chloroform	67-66-3	E611E	1	µg/L	100 µg/L	113	70.0	130	----
Chloromethane	74-87-3	E611E	5	µg/L	100 µg/L	95.1	60.0	140	----
Chlorotoluene, 2-	95-49-8	E611E	1	µg/L	100 µg/L	98.4	70.0	130	----
Chlorotoluene, 4-	106-43-4	E611E	1	µg/L	100 µg/L	109	70.0	130	----
Cymene, p-	99-87-6	E611E	1	µg/L	100 µg/L	93.2	70.0	130	----
Dibromo-3-chloropropane, 1,2-	96-12-8	E611E	1	µg/L	100 µg/L	100	70.0	130	----
Dibromochloromethane	124-48-1	E611E	1	µg/L	100 µg/L	107	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	115	70.0	130	----
Dichlorobenzene, 1,2-	95-50-1	E611E	0.5	µg/L	100 µg/L	102	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	103	70.0	130	----

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Target Concentration	LCS	Low	High	Qualifier
Volatile Organic Compounds (QCLot: 2298662) - continued									
Dichlorodifluoromethane	75-71-8	E611E	1	µg/L	100 µg/L	103	60.0	140	----
Dichloroethane, 1,1-	75-34-3	E611E	1	µg/L	100 µg/L	114	70.0	130	----
Dichloroethane, 1,2-	107-06-2	E611E	1	µg/L	100 µg/L	97.9	70.0	130	----
Dichloroethylene, 1,1-	75-35-4	E611E	1	µg/L	100 µg/L	107	70.0	130	----
Dichloroethylene, cis-1,2-	156-59-2	E611E	1	µg/L	100 µg/L	108	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	112	70.0	130	----
Dichloropropane, 1,2-	78-87-5	E611E	1	µg/L	100 µg/L	104	70.0	130	----
Dichloropropane, 1,3-	142-28-9	E611E	1	µg/L	100 µg/L	91.2	70.0	130	----
Dichloropropane, 2,2-	594-20-7	E611E	1	µg/L	100 µg/L	110	70.0	130	----
Dichloropropylene, 1,1-	563-58-6	E611E	1	µg/L	100 µg/L	103	70.0	130	----
Dichloropropylene, cis-1,3-	10061-01-5	E611E	1	µg/L	100 µg/L	90.6	70.0	130	----
Dichloropropylene, trans-1,3-	10061-02-6	E611E	1	µg/L	100 µg/L	88.8	70.0	130	----
Ethylbenzene	100-41-4	E611E	0.5	µg/L	100 µg/L	86.4	70.0	130	----
Hexachlorobutadiene	87-68-3	E611E	1	µg/L	100 µg/L	103	70.0	130	----
Isopropylbenzene	98-82-8	E611E	1	µg/L	100 µg/L	89.7	70.0	130	----
Methyl-tert-butyl ether [MTBE]	1634-04-4	E611E	0.5	µg/L	100 µg/L	104	70.0	130	----
Propylbenzene, n-	103-65-1	E611E	1	µg/L	100 µg/L	99.0	70.0	130	----
Styrene	100-42-5	E611E	0.5	µg/L	100 µg/L	92.6	70.0	130	----
Tetrachloroethane, 1,1,1,2-	630-20-6	E611E	1	µg/L	100 µg/L	110	70.0	130	----
Tetrachloroethane, 1,1,2,2-	79-34-5	E611E	1	µg/L	100 µg/L	93.4	70.0	130	----
Tetrachloroethylene	127-18-4	E611E	1	µg/L	100 µg/L	110	70.0	130	----
Toluene	108-88-3	E611E	0.5	µg/L	100 µg/L	87.8	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	95.7	70.0	130	----
Trichloroethane, 1,1,1-	71-55-6	E611E	1	µg/L	100 µg/L	116	70.0	130	----
Trichloroethane, 1,1,2-	79-00-5	E611E	1	µg/L	100 µg/L	100	70.0	130	----
Trichloroethylene	79-01-6	E611E	1	µg/L	100 µg/L	115	70.0	130	----
Trichlorofluoromethane	75-69-4	E611E	1	µg/L	100 µg/L	114	60.0	140	----
Trichloropropane, 1,2,3-	96-18-4	E611E	1	µg/L	100 µg/L	96.8	70.0	130	----
Trimethylbenzene, 1,2,4-	95-63-6	E611E	1	µg/L	100 µg/L	98.8	70.0	130	----
Trimethylbenzene, 1,3,5-	108-67-8	E611E	1	µg/L	100 µg/L	95.6	70.0	130	----
Vinyl chloride	75-01-4	E611E	1	µg/L	100 µg/L	97.8	60.0	140	----
Xylene, m+p-	179601-23-1	E611E	0.4	µg/L	200 µg/L	92.8	70.0	130	----
Xylene, o-	95-47-6	E611E	0.3	µg/L	100 µg/L	87.5	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: 2284373)										
CG2515202-014	Anonymous	Fluoride	16984-48-8	E235.F	1.08 mg/L	1 mg/L	108	75.0	125	----
Anions and Nutrients (QCLot: 2284374)										
CG2515202-014	Anonymous	Nitrate (as N)	14797-55-8	E235.NO3	2.56 mg/L	2.5 mg/L	102	75.0	125	----
Anions and Nutrients (QCLot: 2284375)										
CG2515202-014	Anonymous	Nitrite (as N)	14797-65-0	E235.NO2	0.522 mg/L	0.5 mg/L	104	75.0	125	----
Anions and Nutrients (QCLot: 2284376)										
CG2515202-014	Anonymous	Chloride	16887-00-6	E235.Cl	102 mg/L	100 mg/L	102	75.0	125	----
Anions and Nutrients (QCLot: 2284377)										
CG2515202-014	Anonymous	Sulfate (as SO4)	14808-79-8	E235.SO4	102 mg/L	100 mg/L	102	75.0	125	----
Anions and Nutrients (QCLot: 2285179)										
CG2514908-002	Anonymous	Ammonia, total (as N)	7664-41-7	E298	0.0938 mg/L	0.1 mg/L	93.8	75.0	125	----
Dissolved Metals (QCLot: 2284448)										
CG2515178-002	Anonymous	Aluminum, dissolved	7429-90-5	E421	1.93 mg/L	2 mg/L	96.6	70.0	130	----
		Antimony, dissolved	7440-36-0	E421	0.193 mg/L	0.2 mg/L	96.6	70.0	130	----
		Arsenic, dissolved	7440-38-2	E421	0.201 mg/L	0.2 mg/L	100	70.0	130	----
		Barium, dissolved	7440-39-3	E421	0.198 mg/L	0.2 mg/L	99.0	70.0	130	----
		Boron, dissolved	7440-42-8	E421	0.963 mg/L	1 mg/L	96.3	70.0	130	----
		Cadmium, dissolved	7440-43-9	E421	0.0394 mg/L	0.04 mg/L	98.4	70.0	130	----
		Calcium, dissolved	7440-70-2	E421	39.4 mg/L	40 mg/L	98.5	70.0	130	----
		Chromium, dissolved	7440-47-3	E421	0.400 mg/L	0.4 mg/L	100	70.0	130	----
		Copper, dissolved	7440-50-8	E421	0.187 mg/L	0.2 mg/L	93.7	70.0	130	----
		Iron, dissolved	7439-89-6	E421	19.6 mg/L	20 mg/L	98.1	70.0	130	----
		Lead, dissolved	7439-92-1	E421	0.189 mg/L	0.2 mg/L	94.6	70.0	130	----
		Magnesium, dissolved	7439-95-4	E421	ND mg/L	----	ND	70.0	130	----
		Manganese, dissolved	7439-96-5	E421	0.193 mg/L	0.2 mg/L	96.7	70.0	130	----
		Nickel, dissolved	7440-02-0	E421	0.376 mg/L	0.4 mg/L	94.1	70.0	130	----
		Potassium, dissolved	7440-09-7	E421	38.7 mg/L	40 mg/L	96.8	70.0	130	----
		Selenium, dissolved	7782-49-2	E421	0.403 mg/L	0.4 mg/L	101	70.0	130	----
		Silver, dissolved	7440-22-4	E421	0.0392 mg/L	0.04 mg/L	98.1	70.0	130	----
		Sodium, dissolved	7440-23-5	E421	ND mg/L	----	ND	70.0	130	----
		Uranium, dissolved	7440-61-1	E421	0.0405 mg/L	0.04 mg/L	101	70.0	130	----
		Zinc, dissolved	7440-66-6	E421	3.75 mg/L	4 mg/L	93.7	70.0	130	----
Dissolved Metals (QCLot: 2287548)										
CG2515008-002	Anonymous	Mercury, dissolved	7439-97-6	E509	0.000102 mg/L	0 mg/L	102	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: 2287549)										
CG2515200-006	Duplicate	Mercury, dissolved	7439-97-6	E509	0.0000792 mg/L	0 mg/L	79.2	70.0	130	----
Volatile Organic Compounds (QCLot: 2298662)										
CG2515185-001	Anonymous	Benzene	71-43-2	E611E	97.2 µg/L	100 µg/L	97.2	70.0	130	----
		Bromobenzene	108-86-1	E611E	107 µg/L	100 µg/L	107	70.0	130	----
		Bromochloromethane	74-97-5	E611E	117 µg/L	100 µg/L	117	70.0	130	----
		Bromodichloromethane	75-27-4	E611E	106 µg/L	100 µg/L	106	70.0	130	----
		Bromoform	75-25-2	E611E	104 µg/L	100 µg/L	104	70.0	130	----
		Bromomethane	74-83-9	E611E	126 µg/L	100 µg/L	126	60.0	140	----
		Butylbenzene, n-	104-51-8	E611E	90.5 µg/L	100 µg/L	90.5	70.0	130	----
		Butylbenzene, sec-	135-98-8	E611E	106 µg/L	100 µg/L	106	70.0	130	----
		Butylbenzene, tert-	98-06-6	E611E	96.4 µg/L	100 µg/L	96.4	70.0	130	----
		Carbon tetrachloride	56-23-5	E611E	110 µg/L	100 µg/L	110	70.0	130	----
		Chlorobenzene	108-90-7	E611E	102 µg/L	100 µg/L	102	70.0	130	----
		Chloroethane	75-00-3	E611E	105 µg/L	100 µg/L	105	60.0	140	----
		Chloroform	67-66-3	E611E	106 µg/L	100 µg/L	106	70.0	130	----
		Chloromethane	74-87-3	E611E	100 µg/L	100 µg/L	100	60.0	140	----
		Chlorotoluene, 2-	95-49-8	E611E	99.7 µg/L	100 µg/L	99.7	70.0	130	----
		Chlorotoluene, 4-	106-43-4	E611E	107 µg/L	100 µg/L	107	70.0	130	----
		Cymene, p-	99-87-6	E611E	91.3 µg/L	100 µg/L	91.3	70.0	130	----
		Dibromo-3-chloropropane, 1,2-	96-12-8	E611E	101 µg/L	100 µg/L	101	70.0	130	----
		Dibromochloromethane	124-48-1	E611E	108 µg/L	100 µg/L	108	70.0	130	----
		Dibromoethane, 1,2-	106-93-4	E611E	103 µg/L	100 µg/L	103	70.0	130	----
		Dibromomethane	74-95-3	E611E	111 µg/L	100 µg/L	111	70.0	130	----
		Dichlorobenzene, 1,2-	95-50-1	E611E	103 µg/L	100 µg/L	103	70.0	130	----
		Dichlorobenzene, 1,3-	541-73-1	E611E	105 µg/L	100 µg/L	105	70.0	130	----
		Dichlorobenzene, 1,4-	106-46-7	E611E	103 µg/L	100 µg/L	103	70.0	130	----
		Dichlorodifluoromethane	75-71-8	E611E	109 µg/L	100 µg/L	109	60.0	140	----
		Dichloroethane, 1,1-	75-34-3	E611E	109 µg/L	100 µg/L	109	70.0	130	----
		Dichloroethane, 1,2-	107-06-2	E611E	88.1 µg/L	100 µg/L	88.1	70.0	130	----
		Dichloroethylene, 1,1-	75-35-4	E611E	112 µg/L	100 µg/L	112	70.0	130	----
		Dichloroethylene, cis-1,2-	156-59-2	E611E	99.1 µg/L	100 µg/L	99.1	70.0	130	----
		Dichloroethylene, trans-1,2-	156-60-5	E611E	123 µg/L	100 µg/L	123	70.0	130	----
		Dichloromethane	75-09-2	E611E	126 µg/L	100 µg/L	126	70.0	130	----
		Dichloropropane, 1,2-	78-87-5	E611E	99.5 µg/L	100 µg/L	99.5	70.0	130	----
		Dichloropropane, 1,3-	142-28-9	E611E	91.0 µg/L	100 µg/L	91.0	70.0	130	----
		Dichloropropane, 2,2-	594-20-7	E611E	93.9 µg/L	100 µg/L	93.9	70.0	130	----
		Dichloropropylene, 1,1-	563-58-6	E611E	94.8 µg/L	100 µg/L	94.8	70.0	130	----
		Dichloropropylene, cis-1,3-	10061-01-5	E611E	94.9 µg/L	100 µg/L	94.9	70.0	130	----
		Dichloropropylene, trans-1,3-	10061-02-6	E611E	88.1 µg/L	100 µg/L	88.1	70.0	130	----
		Ethylbenzene	100-41-4	E611E	85.6 µg/L	100 µg/L	85.6	70.0	130	----
		Hexachlorobutadiene	87-68-3	E611E	105 µg/L	100 µg/L	105	70.0	130	----
		Isopropylbenzene	98-82-8	E611E	90.5 µg/L	100 µg/L	90.5	70.0	130	----
		Methyl-tert-butyl ether [MTBE]	1634-04-4	E611E	103 µg/L	100 µg/L	103	70.0	130	----
		Propylbenzene, n-	103-65-1	E611E	104 µg/L	100 µg/L	104	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
Volatile Organic Compounds (QCLot: 2298662) - continued										
CG2515185-001	Anonymous	Styrene	100-42-5	E611E	89.8 µg/L	100 µg/L	89.8	70.0	130	----
		Tetrachloroethane, 1,1,1,2-	630-20-6	E611E	114 µg/L	100 µg/L	114	70.0	130	----
		Tetrachloroethane, 1,1,2,2-	79-34-5	E611E	95.3 µg/L	100 µg/L	95.3	70.0	130	----
		Tetrachloroethylene	127-18-4	E611E	107 µg/L	100 µg/L	107	70.0	130	----
		Toluene	108-88-3	E611E	86.9 µg/L	100 µg/L	86.9	70.0	130	----
		Trichlorobenzene, 1,2,3-	87-61-6	E611E	99.3 µg/L	100 µg/L	99.3	70.0	130	----
		Trichlorobenzene, 1,2,4-	120-82-1	E611E	95.1 µg/L	100 µg/L	95.1	70.0	130	----
		Trichloroethane, 1,1,1-	71-55-6	E611E	110 µg/L	100 µg/L	110	70.0	130	----
		Trichloroethane, 1,1,2-	79-00-5	E611E	105 µg/L	100 µg/L	105	70.0	130	----
		Trichloroethylene	79-01-6	E611E	120 µg/L	100 µg/L	120	70.0	130	----
		Trichlorofluoromethane	75-69-4	E611E	124 µg/L	100 µg/L	124	60.0	140	----
		Trichloropropane, 1,2,3-	96-18-4	E611E	97.4 µg/L	100 µg/L	97.4	70.0	130	----
		Trimethylbenzene, 1,2,4-	95-63-6	E611E	97.6 µg/L	100 µg/L	97.6	70.0	130	----
		Trimethylbenzene, 1,3,5-	108-67-8	E611E	96.8 µg/L	100 µg/L	96.8	70.0	130	----
		Vinyl chloride	75-01-4	E611E	103 µg/L	100 µg/L	103	60.0	140	----
		Xylene, m+p-	179601-23-1	E611E	196 µg/L	200 µg/L	98.2	70.0	130	----
		Xylene, o-	95-47-6	E611E	86.6 µg/L	100 µg/L	86.6	70.0	130	----

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Chain of Custody / Analytical Request Form
Canada Toll Free: 1 800 668 9878
www.alsglobal.com

COC # CORD Lindsay Thurber

Page 1 of 1

Report to:		Report Format / Distribution		Service Requested:	
Company:	Tetra Tech Canada Inc.	☐ Standard ☐ Other		☑	Regular Service (Default)
Contact:	Kara Heckert	☑ PDF ☑ Excel ☐ Fax		☐	Rush Service (2-3 Days)
Address:	110, 140 Quarry Park Blvd SE, Calgary, AB T2C 3G3	Email 1:	kara.heckert@tetratech.com	☐	Priority Service (1 Day or ASAP)
		Email 2:	WILLEM.VERDUYN@tetratech.com	☐	Emergency Service (<1 Day / Wkend) - Contact ALS
Phone:	431-554-1745 Fax:	ALS Digital Crosstab results, EsDAT compatible data		Analysis Request	
Invoice To:	☑ Same as Report	Indicate Bottles: Filtered / Preserved (F/P) →			
Company:	SAME AS REPORT	**Client / Project Information:**			
Contact:		Job #:	SWM.SWOP04071-05.008		
Address:		PO/AFE:	SWM.SWOP04071-05.008		
Sample		Legal Site Description:			
Phone:	Fax:	Quote #:	CG22-EBAE100-0021		
Lab Work Order # (lab use only)		**ALS Contact:**	Patryk Wojciak	**Sampler** (Initials):	WV Willem Verduyn

Sample #	Sample Identification (This description will appear on the report)	Date dd-mmm-yy	Time hh:mm	Sample Type (Select from drop-down list)	S5421B (Rout+diss metals+H	E611E - VOCs	E298 - Ammonia									ted?	ners
	MW-02	16-10-25	14:10	Water	X	X	X										
	MW-03		13:50	Water	X	X	X										
	MW-04		13:30	Water	X	X	X										
	BH8		13:40	Water	X	X	X										
	22MW05		13:00	Water	X	X	X										
	Duplicate			Water	X	X	X										

Environmental Division
Calgary
Work Order Reference
CG2515200

Telephone : +1 403 407 1600

Guidelines / Regulations	Special Instructions / Hazardous Details

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 adjacent worksheet.

Relinquished By:	Willem	Date & Time:	Oct 16 25	Received By:		Date & Time:	10/17	Sample Condition (lab use only)	
Relinquished By:	Verduyn	Date & Time:	17/25	Received By:		Date & Time:	13:40	Temperature: 2.0	Samples Received in Good Condition? Y / N (if no provided details)

APPENDIX E

HISTORICAL ANALYTICAL RESULTS

Appendices that have been authenticated through Notarius are encrypted; therefore, the secure files have been included as attachments within the PDF. To access the authenticated appendices, open the document in Adobe and locate the paperclip icon in the tool bar.

APPENDIX F

BOREHOLE LOGS

PROJECT: Phase II ESA Historic Waste Disposal Sites	**BOREHOLE No.:** VW-01
PROJECT No.: 12-435	**DRILL TYPE:** SS Auger
LOCATION: Lindsay Thurber Comprehensive High School	**GROUND ELEVATION:** 853.853 m
CLIENT: The City of Red Deer	**COMPLETION DATE:** 06/22/2013

Sample Type: Shelby Tube | Split Spoon | Core | Disturbed | No Recovery

Backfill Type: Bentonite | Silica Sand | Grout | Pea Gravel | Drill Cuttings | Bentonite : Sand

Notes: Located on east side of 42A Avenue. ~ 5 m east of curb fence

Depth (m)	Soil Description	Sample Type	Sample No.	SPT (N)	Combustible Soil Vapours (ppm)		Well Details
0.0	Grass/loam - soft, silty, some clay, trace sand, moist, dark olive (~ 0.5 m thick).						
	Clay (fill) - firm, silty, some sand, trace gravel, trace organics, moist, dark olive.						
1.0	Sand & gravel (fill) - compact, some silt, moist, olive brown.						
2.0	Clay (fill) - soft, silty, trace gravel, moist, olive brown. becomes wet at 2.3 m.						
3.0	Sand (fill) - loose, silty, trace clay, wet, olive.						
4.0	Sand & gravel (native) - compact, trace silt, wet, olive.						
	End of hole at 4.6 m. 25 mm diameter 0.3 m 020 PVC screen. Flush mount bolt-down steel casing set in concrete.						
5.0							
6.0							
7.0							
8.0							
9.0							
10.0							
11.0							
12.0							

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Slough :	Completion Depth (m): 4.6
Depth to Groundwater :	Checked By: LTM
Logged By: LTM	Page: 1 of 1

PROJECT: Phase II ESA Historic Waste Disposal Sites	**BOREHOLE No.:** VW-02
PROJECT No.: 12-435	**DRILL TYPE:** SS Auger
LOCATION: Lindsay Thurber Comprehensive High School	**GROUND ELEVATION:** 853.535 m
CLIENT: The City of Red Deer	**COMPLETION DATE:** 07/14/2013

Sample Type: Shelby Tube | Split Spoon | Core | Disturbed | No Recovery

Backfill Type: Bentonite | Silica Sand | Grout | Pea Gravel | Drill Cuttings | Bentonite : Sand

Notes: ~ 2.0 m north of MW-02 along east fense of the Riverglen School yard

Depth (m)	Soil Description	Sample Type	Sample No.	SPT (N)	Combustible Soil Vapours (ppm)	Well Details
0.0	Loam - sandy, silty, trace rootlets, trace clay, moist, light olive (~ 0.2 m thick).					
	Sand (fill) - compact, trace silts, moist, olive.					
	some gravels at 0.8 m.					
1.0	No obvious waste material.					
2.0						
3.0	End of hole at 3.0 m. 25 mm diameter 020 PVC screen. Aboveground lockable steel casing.					
4.0						
5.0						
6.0						
7.0						
8.0						
9.0						
10.0						
11.0						
12.0						

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Slough :	Completion Depth (m): 3.0
Depth to Groundwater :	Checked By: LTM
Logged By: LTM	Page: 1 of 1

PROJECT: Phase II ESA Historic Waste Disposal Sites	**BOREHOLE No.:** VW-03
PROJECT No.: 12-435	**DRILL TYPE:** Marouka
LOCATION: Lindsay Thurber Comprehensive High School	**GROUND ELEVATION:** 853.245 m
CLIENT: The City of Red Deer	**COMPLETION DATE:** 07/13/2013

Sample Type: Shelby Tube | Split Spoon | Core | Disturbed | No Recovery

Backfill Type: Bentonite | Silica Sand | Grout | Pea Gravel | Drill Cuttings | Bentonite : Sand

Notes: West of MW-03

Depth (m)	Soil Description	Sample Type	Sample No.	SPT (N)	Combustible Soil Vapours (ppm)	Well Details
0.0	Grass/loam/sand - loose, silty, moist, dark olive (~ 0.2 m thick).					
	Sand (fill) - compact, trace silts, moist, olive.					
1.0						
2.0	Sand & gravel (fill) - compact, silty, wet, olive.					
3.0	End of hole at 3.0 m. 25 mm diameter 0.30 m 020 PVC screen. Aboveground lockable steel casing.					
4.0						
5.0						
6.0						
7.0						
8.0						
9.0						
10.0						
11.0						
12.0						

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Slough :	Completion Depth (m): 3.0
Depth to Groundwater :	Checked By: LTM
Logged By: LTM	Page: 1 of 1

PROJECT: Phase II ESA Historic Waste Disposal Sites	**BOREHOLE No.:** VW-04
PROJECT No.: 12-435	**DRILL TYPE:** SS Auger
LOCATION: Lindsay Thurber Comprehensive High School	**GROUND ELEVATION:** 854.476 m
CLIENT: The City of Red Deer	**COMPLETION DATE:** 06/22/2013

Sample Type: Shelby Tube | Split Spoon | Core | Disturbed | No Recovery

Backfill Type: Bentonite | Silica Sand | Grout | Pea Gravel | Drill Cuttings | Bentonite : Sand

Notes: Near northeast corner of school

Depth (m)	Soil Description	Sample Type	Sample No.	SPT (N)	Combustible Soil Vapours (ppm)	Well Details
0.0	Asphalt pavement (~ 0.1 m thick).					
	Sand & gravel (fill) - subbase, some silt, damp to moist, olive.					
	Sand (fill) - loose, trace silts, damp to moist, light olive.					
1.0						
	Sand & gravel (fill) - loose, moist, olive.					
2.0						
	Silt (fill) - firm, sandy, some clay, trace organics, moist, olive.					
3.0	End of hole at 3.0 m. 25 mm diameter 020 PVC screen. Flush mount bolt-down steel casing set in concrete.					
4.0						
5.0						
6.0						
7.0						
8.0						
9.0						
10.0						
11.0						
12.0						

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Slough :	Completion Depth (m): 3.0
Depth to Groundwater :	Checked By: LTM
Logged By: JAL/LTM	Page: 1 of 1

PROJECT: Phase II ESA Historic Waste Disposal Sites	**BOREHOLE No.:** VW-05
PROJECT No.: 12-435	**DRILL TYPE:** SS Auger
LOCATION: Lindsay Thurber Comprehensive High School	**GROUND ELEVATION:** 854.046 m
CLIENT: The City of Red Deer	**COMPLETION DATE:** 06/22/2013

Sample Type: Shelby Tube | Split Spoon | Core | Disturbed | No Recovery

Backfill Type: Bentonite | Silica Sand | Grout | Pea Gravel | Drill Cuttings | Bentonite : Sand

Notes:

Depth (m)	Soil Description	Sample Type	Sample No.	SPT (N)	Combustible Soil Vapours (ppm)		Well Details
0.0	Asphalt pavement (~ 0.1 m thick).						
	Subbase gravel.						
	Silt (fill) - firm, sandy, trace clay, moist, olive.						
1.0	Organic loam (fill) - firm, fine sand, silty, trace clay, moist, dark olive.						
2.0	becomes clayey at 2.6 m						
	End of hole at 2.7 m.						
3.0	25 mm diameter 020 PVC screen.						
	Flush mount bolt-down steel casing set in concrete.						
4.0							
5.0							
6.0							
7.0							
8.0							
9.0							
10.0							
11.0							
12.0							

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Slough : 0.30 m	Completion Depth (m): 2.7
Depth to Groundwater :	Checked By: LTM
Logged By: JAL/LTM	Page: 1 of 1

PROJECT: Phase II ESA Historic Waste Disposal Sites	**BOREHOLE No.:** MW-01
PROJECT No.: 12-435	**DRILL TYPE:** SS Auger/ODEX
LOCATION: Lindsay Thurber Comprehensive High School	**GROUND ELEVATION:** 853.767 m
CLIENT: The City of Red Deer	**COMPLETION DATE:** 06/22/2013

Sample Type: Shelby Tube | Split Spoon | Core | Disturbed | No Recovery

Backfill Type: Bentonite | Silica Sand | Grout | Pea Gravel | Drill Cuttings | Bentonite : Sand

Notes: Located near 42A Avenue ~ 5 m. East of the curb and ~ 2 m. West of VW-01

Depth (m)	Soil Description	Sample Type	Sample No.	SPT (N)	Combustible Soil Vapours (ppm)	Well Details
0.0	Grass/loam - soft, silty, some clay, trace sand, moist, dark olive (~ 0.5 m thick).					
	Clay (fill) - firm, silty, moist, olive brown. some gravel at 0.6 m. plastic at 0.8 m.					
1.0						
	Sand (fill) - compact, silty, some clay, moist, olive brown.					
2.0	becomes wet at 2.4 m.					
3.0	Clay (fill) - soft, wet, olive brown.					
	Sand (native) - loose, some clay, wet, olive brown.					
4.0	trace gravels at 4.3 m.					
	Sand & gravel (native) - loose, wet, olive brown.					
5.0						
	Sandstone (bedrock) - weak, highly weathered, damp, light olive grey.					
6.0	End of hole at 6.1 m. 51 mm diameter 010 PVC screen. 1.5 m solid PVC pipe. Flush mount bolt-down steel casing set in concrete.					
7.0						
8.0						
9.0						
10.0						
11.0						
12.0						

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Slough :	Completion Depth (m): 6.1
Depth to Groundwater :	Checked By: LTM
Logged By: JAL/LTM	Page: 1 of 1

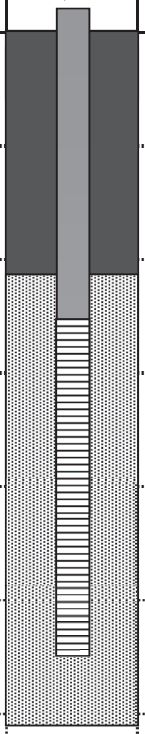
PROJECT: Phase II ESA Historic Waste Disposal Sites	**BOREHOLE No.:** MW-02
PROJECT No.: 12-435	**DRILL TYPE:** SS Auger
LOCATION: Lindsay Thurber Comprehensive High School	**GROUND ELEVATION:** 853.585 m
CLIENT: The City of Red Deer	**COMPLETION DATE:** 07/14/2013

Sample Type: Shelby Tube | Split Spoon | Core | Disturbed | No Recovery

Backfill Type: Bentonite | Silica Sand | Grout | Pea Gravel | Drill Cuttings | Bentonite : Sand

Notes: East side of bike/pedestrian pathway

Depth (m)	Soil Description	Sample Type	Sample No.	SPT (N)	Combustible Soil Vapours (ppm)	Well Details
0.0	Loam - sand, silty, trace rootlets, trace clay, moist, light olive brown (~ 0.2 m thick). Sand & gravel (fill) - compact, trace silts, damp to moist, olive.					
1.0	No obvious waste material.					
2.0						
3.0						
4.0						
5.0						
6.0	End of hole at 6.1 m. 51 mm diameter 010 PVC screen. Aboveground lockable steel casing.					
7.0						
8.0						
9.0						
10.0						
11.0						
12.0						



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Slough :	Completion Depth (m): 6.1
Depth to Groundwater :	Checked By: LTM
Logged By: LTM	Page: 1 of 1

PROJECT: Phase II ESA Historic Waste Disposal Sites	**BOREHOLE No.:** MW-03
PROJECT No.: 12-435	**DRILL TYPE:** SS Auger
LOCATION: Lindsay Thurber Comprehensive High School	**GROUND ELEVATION:** 853.225 m
CLIENT: The City of Red Deer	**COMPLETION DATE:** 07/13/2013

Sample Type: Shelby Tube | Split Spoon | Core | Disturbed | No Recovery

Backfill Type: Bentonite | Silica Sand | Grout | Pea Gravel | Drill Cuttings | Bentonite : Sand

Notes:

Depth (m)	Soil Description	Sample Type	Sample No.	SPT (N)	Combustible Soil Vapours (ppm)	Well Details
0.0	Loam - soft to firm, silty, some sand, trace rootlets, moist, olive (~ 0.2 m thick).					
	Sand (fill) - compact, silty, some gravel, damp to moist, olive.					
	some gravels at 0.6 m.					
1.0						
	becomes wet at 1.8 m.					
2.0	No obvious waste material.					
3.0						
4.0						
	End of hole at 4.6 m.					
	51 mm diameter 010 PVC screen.					
5.0	Aboveground lockable steel casing.					
6.0						
7.0						
8.0						
9.0						
10.0						
11.0						
12.0						

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Slough :	Completion Depth (m): 4.6
Depth to Groundwater :	Checked By: LTM
Logged By: LTM	Page: 1 of 1

PROJECT: Phase II ESA Historic Waste Disposal Sites	**BOREHOLE No.:** MW-04
PROJECT No.: 12-435	**DRILL TYPE:** SS Auger
LOCATION: Lindsay Thurber Comprehensive High School	**GROUND ELEVATION:** 851.781 m
CLIENT: The City of Red Deer	**COMPLETION DATE:** 07/13/2013

Sample Type: Shelby Tube | Split Spoon | Core | Disturbed | No Recovery

Backfill Type: Bentonite | Silica Sand | Grout | Pea Gravel | Drill Cuttings | Bentonite : Sand

Notes: Adjacent to Riverglen School yard fence, east of the basketball court.

Depth (m)	Soil Description	Sample Type	Sample No.	SPT (N)	Combustible Soil Vapours (ppm)	Well Details
0.0	Loam (~ 0.2 m thick) - soft, silt, some sand, moist, olive brown.					
	Sand & gravel (fill) - compact, some loam, moist, olive.					
1.0	becomes silty at 1.2 m.					
	becomes wet at 1.8 m.					
2.0						
3.0						
4.0						
	End of hole at 4.6 m.					
	51 mm diameter 010 PVC screen.					
5.0	Aboveground lockable steel casing.					
6.0						
7.0						
8.0						
9.0						
10.0						
11.0						
12.0						

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Slough :	Completion Depth (m): 4.6
Depth to Groundwater :	Checked By: LTM
Logged By: LTM	Page: 1 of 1

RED DEER PUBLIC SCHOOL DISTRICT 104	SOLID STEM AUGER	BOREHOLE NO: 8
LINDSAY THURBER LANDFILL ASSESSMENT	EVERGREEN DRILLING	PROJECT NO: RD1181
SE21-38-27-W4M, RED DEER, AB		ELEVATION: 852.27 m

SAMPLE TYPE: TUBE | BULK | SPT | Grab | Split Pen | Core Sample

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

Depth(m)	Soil Description	SOIL SYMBOL	PLASTIC / M.C. / LIQUID (20 40 60 80)	SAMPLE TYPE	SAMPLE NO	SPT(N)	Comments/Other Data	WELL INSTALLATION	ELEVATION(m)
0.0	TOPSOIL: silty, organic, black, moist.								852.0
	SAND: course grained, well graded, some silt, dense, brown, damp.								
1.0									851.0
2.0									850.0
3.0	– wet.								849.0
	GRAVEL: pitrun, well graded, dense, wet.								
4.0									848.0
5.0									847.0
6.0	End at 6.0 m. Well installed to 6.0 m. Trace water at completion. Water at 3.07 m on March 27, 2004. Water at 2.78 m on June 21, 2004.								846.0
7.0									845.0
8.0									

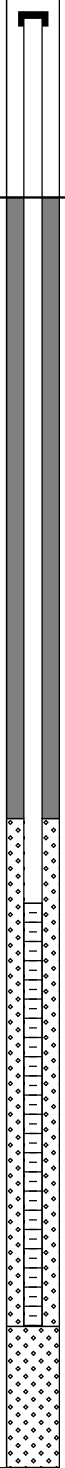
Parkland Geotechnical Consulting Ltd. Red Deer, Alberta	LOGGED BY: RDW REVIEWED BY: MDB	COMPLETION DEPTH: 6 m COMPLETE: 03/17/04 Page 1 of 1

04/06/30 12:00PM (PARKLAND)

Borehole No: **22MW05**

Project: LTCHS Monitoring Well Installation	Project No: SWM.SWOP04071-02.008
Location: Lindsay Thurber Composite High School	
Red Deer, Alberta	UTM: E; N; Z 12

Depth (m)	Method	Soil Description	Notes and Comments	Depth (ft)
0		TOPSOIL AND PEAT - rootlets, dark brown, frozen, (300 mm thick)		0
		SAND - some gravel, fine grained sand, dark brown		
1		- wet		1
		SAND AND GRAVEL - rounded gravel, very wet, dark brown		2
	Solid stem auger			3
2				4
				5
				6
				7
				8
				9
3				10
		GRAVEL - some sand, rounded gravel, fine grained sand, very wet		11
				12
				13
4				14
				15
		END OF BOREHOLE (4.5 metres) water - 2.9 metres Monitoring well installed to 4.0 metres		16
5				



Contractor: CP Drilling	Completion Depth: 4.5 m
Equipment Type: Track mounted	Start Date: 2022 February 1
Logged By: MS	Completion Date: 2022 February 1
Reviewed By: FH	Page 1 of 1