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ALBERNI CLAYOQUOT REGIONAL DISTRICT

ALBERNI VALLEY LANDFILL
2025 WATER QUALITY MONITORING PROGRAM

PORT ALBERNI, BC

Prepared for

ALBERNI CLAYOQUOT REGIONAL DISTRICT

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EXECUTIVE SUMMARY

This report provides the 2025 annual summary for a surface and groundwater monitoring program at the Alberni Valley Landfill (AVL) near Port Alberni, BC. The monitoring program has been ongoing since 1994 and involves water level monitoring and analysis of samples collected from eight monitoring wells screened in overburden (surficial sediments), eleven monitoring wells in bedrock, four leachate interception wells, two surface leachate sampling locations, four surface water sampling sites, and six domestic wells in 2025.

The AVL is located on the west side of the Alberni Valley, in a natural bedrock basin near the crest of a wide ridge that separates the top end of Alberni Inlet from Sproat Lake. Groundwater flow in bedrock is interpreted to be very slow moving due to the low hydraulic conductivity of the rock mass and low hydraulic gradient. There is a groundwater flow divide in the bedrock that bisects the landfill area. Groundwater on the west and north sides of the landfill flows westward, and flow on the east side is easterly and southeasterly. Two bedrock pumping wells on the east side of the landfill maintain an inward groundwater flow direction (i.e., towards the landfill) within a zone of fractured or faulted bedrock in the southeast corner of the landfill.

Groundwater flow in the limited amount of overburden beneath the landfill is interpreted to dominate the flow regime due to the low hydraulic conductivity of the bedrock. Flow in overburden north of the landfill is captured with a clay berm and interception trench pumping system. A French drain in the South Expansion Area directs seepage to the flow equalization pond, and the seepage cut-off wall/berm at the west of the property intercepts seepage that may have migrated west to Heath Creek. Seepage from the southeast corner of the property in surficial sediments is intercepted by two leachate interception wells.

Current leachate indicator concentrations in the leachate are typical for a landfill of the size and age of AVL. Minor leachate effects in surficial sediments on the north side of the landfill are mitigated by the north leachate interception trench and pumping system. Similarly, effects east of the landfill near the flow equalization pond are intercepted by pumping of the surficial sediment interception wells. Monitoring data for bedrock monitoring wells indicate no leachate effects have occurred to the south, and only slight leachate effects have occurred to the west, north, northeast and east of the present landfill footprint. No indication of leachate effect was measured at the domestic wells northeast of the landfill.

The surface and groundwater monitoring program should continue, and should include analysis of samples from new monitoring wells drilled in 2024. Leachate interception well pumping rates and water levels, and water levels in monitoring wells, should continue to be monitored by the SCADA system. The recorded data should be reviewed on a quarterly basis to ensure effective operation of the leachate collection system.

RECORD OF AMENDMENTS

This report has been issued and amended as follows:

Issue	Version	Date	Prepared by	Reviewed by
1	Draft	February 18, 2026	Jennifer Mancer, P.Eng. Senior Hydrogeologist Rebekah Manning, P.Eng. Intermediate Hydrogeologist	David Tiplady, P.Eng. Principal Consultant - Hydrogeology
2	Final	March 13, 2026	Jennifer Mancer, P.Eng. Senior Hydrogeologist Rebekah Manning, P.Eng. Intermediate Hydrogeologist	David Tiplady, P.Eng. Principal Consultant - Hydrogeology

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1 INTRODUCTION

The Alberni Valley Landfill (AVL) is located on the west side of the Alberni Valley, near the crest of a wide ridge that separates the top end of Alberni Inlet from Sproat Lake (Figure 1). This is about 5 km west of Port Alberni and at an elevation of about 80 m above sea level. Access is provided by Landfill Road off McCoy Lake Road or by the Stirling Arm logging road that passes along the south side of the property (Figure 2).

The AVL is owned by the Alberni-Clayoquot Regional District (ACRD) and operates under Operational Certificate MR-00524 issued by the Ministry of Water, Land and Air Protection on June 29, 2004. Piteau Associates Engineering Ltd. (Piteau) has overseen the AVL monitoring program since 1994. The purpose of this program is to evaluate the effect of the landfill on the surrounding surface water and groundwater regime. This report has been prepared to summarize and assess the results of monitoring completed in 2025.

For reporting purposes, the landfill property is subdivided into the four areas shown on Figure 2, which are based on the operational certificate. These include the Original Landfill Area; the East Expansion Area first filled in 2004; the Northeast Expansion Area first filled in 2014; and the South Expansion area. Descriptions of the landfill history, setting, geology, landfill design and leachate control measures, and the landfill monitoring program are included in the 2019 Water Quality Monitoring Report (Piteau, 2020).

2 DESCRIPTION OF 2025 ACTIVITIES

2.1 LEACHATE PUMPING AND SCADA SYSTEMS

Optimization of the leachate pumping and SCADA monitoring system continued through 2025. The well pumps were serviced on an as-needed basis, and controls were adjusted as required to maintain levels. Batteries and memory cards were replaced in data logging systems in the outlying monitoring wells to provide relatively continual water level data. Data collected by the SCADA system are accessed through an online web portal and are presented on time-series plots in Appendix A.

2.2 MONITORING FREQUENCY AND PARAMETERS

Surface and groundwater monitoring performed at AVL during 2025 was completed by ACRD in accordance with the schedule in Table 1. Most locations are monitored quarterly, and a few locations are monitored annually.

2.3 MONITORING METHODS

Static water levels were measured in all pumping and monitoring wells with a graduated electric water level tape prior to each sampling event. In addition, the AVL SCADA system records water levels at key locations at the north boundary and east side of the landfill. Manual water elevation measurements for 2025 are presented in Table A-1, and manual and SCADA-recorded water level elevations are included on time-series plots in Appendix A.

Most monitoring wells were purged with Waterra Hydrolift pumps with Waterra inertial foot valve pumps on HDPE tubing prior to collection of groundwater samples. As in past years, the recommended well purge amount for the sampling program was three standing water volumes for wells with immediate recovery, and one standing well volume for those with slow recovery. Samples were collected immediately after purging when sufficient water was available. One well volume was purged from bedrock monitoring wells that have low recharge rates. In these cases, the samples were collected on the following day when the monitoring well water level had recovered sufficiently.

Due to their shallow depths, the heights of standing water in MW98-9 and MW98-10 on the north side of the landfill, and MW23-1S near Stevens Creek, are often insufficient for groundwater samples to be collected using Waterra pumps. Samples from these wells were, therefore, collected using an alternative low-flow method that employs a peristaltic pump.

Samples from leachate interception wells PW-1, PW-2, PW15-1 and PW15-2 were collected from the outlet of the 50 mm diameter discharge pipe from the installed pumps. If not already operating, the pumps were switched on manually and the samples collected after a few minutes of pumping.

All surface water sites were grab sampled.

Six domestic wells located approximately five kilometres northeast of the landfill were sampled on September 15, 2025. Five of these are dug wells that are reported to be less than six metres deep, and the sixth is a drilled well that is reported to be 29 m deep. At two of the locations, the water was sampled directly from the well; at one house, water was sampled from the pressure tank, and at the other three houses, water samples were collected from outside hose ports after running the flow to waste for approximately five minutes.

In all cases, electrical conductivity (EC), temperature and pH were measured at the time of sample collection using field-portable digital measurement equipment. The equipment was calibrated against known standards or buffer solutions prior to each sampling event.

Samples for ammonia (NH_3) and chemical oxygen demand (COD) were preserved with sulphuric acid (H_2SO_4) at the time of collection. Groundwater samples for dissolved metals were filtered with single-use, 0.45 micron inline filters at the time of collection. All samples were stored with ice in a cooler and couriered to the laboratory. All samples collected in 2025 were analyzed by ALS Canada Ltd.

Summaries of analytical data and time-series plots of key leachate indicator parameters for the period of record are presented in Appendix B.

2.4 QUALITY ASSURANCE/QUALITY CONTROL

Quality assurance/quality control (QA/QC) processes incorporated in the monitoring program included measures by both the analytic laboratory and by field personnel collecting the samples. The laboratory component includes analysis of quality control samples to define precision and accuracy, and to demonstrate contamination control for the type of samples and parameters under investigation. These measures include analysis of laboratory replicates, method blanks, and certified reference materials.

QA/QC processes are inherent in the field program to ensure sample integrity. These include prevention of cross contamination and introduction of foreign contaminants during sample collection through the use of new latex or nitrile gloves and dedicated sampling equipment at each sample location. Additionally, all samples were transferred to containers provided by the project laboratory.

The QA/QC measures also included collection and analysis of one field duplicate sample for every ten samples (10%) collected to verify analytical precision (i.e., repeatability). In 2025, duplicates were collected for 8% of samples due to dry sampling sites. The relative percent difference (RPD) between the sample and the duplicate was calculated using the following equation:

$$RPD = \frac{(C_1 - C_2)}{(C_1 + C_2)/2} \times 100\%$$

where:

RPD is relative percent difference;
C1 is the larger of the two observed values; and
C2 is the smaller of the two observed values.

RPD values below about 35% are generally desirable, and values of up to about 65% are considered acceptable. With the exception of a value of 77% for sulphate in the March 2025 sample from Stevens Creek, RPDs for all analytes in all field duplicate samples collected in 2025 were below 65% (Appendix C). Both the primary and duplicate sample for Stevens Creek had low sulphate concentrations (0.73 mg/L and 1.65 mg/L respectively), and were within the range of sulphate concentrations historically reported for this location. The concentrations were also well below the water quality guideline and standard for sulphate (218 to 2180 mg/L). There were no instances in which the duplicate exceeded applicable regulatory objectives and limits described in Section 4 and the primary sample did not.

2.5 WATER LEVEL MONITORING AT NEW MONITORING WELLS

Nested monitoring wells MW24-1D and MW24-1S were installed in a single borehole drilled into bedrock between the east side of the landfill and Christie Creek (Figures 2 and 3) in October 2024[1]. MW24-1D is screened between 11.9 and 13.7 metres below ground surface (mbgs), and MW24-1S is screened between 4.9 and 7.0 mbgs. Dataloggers measured and recorded water levels in both wells during 2025 in addition to regular manual water level measurements.

MW24-1D was purged dry in February and April 2025 in support of establishing a sampling methodology and estimating hydraulic conductivity in the bedrock surrounding the screen intervals. There was not enough water present in either well to sample in July 2025. The monitoring results for MW24-1D and MW24-1S are discussed in Section 3.1.1.

[1] This monitoring well was added in response to technical comments on the landfill monitoring program received from Tseshaht First Nation (Piteau, 2025).

3 GROUNDWATER FLOW

3.1 GROUNDWATER FLOW IN BEDROCK

The bedrock flow regime is interpreted to be very slow moving due to the low hydraulic conductivity of the rock mass and low hydraulic gradient (0.06 m/m) to the ultimate discharge area along the shore of Alberni Inlet (Piteau, 1995, 2000 and 2002). Flow beneath the original landfill area is interpreted to radiate to the north, northwest, southeast and east, and flow beneath most of the expansion areas is interpreted to be easterly and southeasterly, except for the extreme western edge, where westward groundwater flow is interpreted to occur (Figure 3).

A flow divide is interpreted to bisect the original landfill area. Flow on the west side of the divide is interpreted to trend west and, on the east side flow is interpreted to be southeasterly to easterly. Based on static heads at MW13-1 and MW13-2 (Figures 3, 4, 5 and A-12), the divide is interpreted to extend along the north leachate interception/conveyance channel next to the northeast expansion area.

In 2025, the lowest representative hydraulic heads in bedrock were recorded in leachate interception wells PW-1 and PW15-1 (Table A-1 and Figure 3). Heads in adjacent monitoring wells MW05-1D, MW02-3D, and MW15-1D also show some drawdown due to operation of PW-1 and PW15-1 (Figures 4, A-8 and A-9).

Operation of the pumps induces groundwater flow in bedrock towards the wells and interception of leachate (Figures 4 and A-8). When neither PW-1 nor PW15-1 are operating, groundwater flow in bedrock beneath the east edge of the landfill is upwards towards the surficial sediments and easterly towards Christie Creek. No SCADA data from these wells are available between January 1 and September 28, 2025, due to a faulty memory card in the SCADA system. However, based on the available data for 2025, it appears that the pumping system effectively intercepted leachate throughout the year (Figure A-9).

3.1.1 Water Level Monitoring in MW24-1D and MW24-1S

In October 2024, two new monitoring wells were installed into bedrock between the east side of the landfill and Christie Creek (Figures 2 and 3). Water levels had recovered to within 1 m of ground surface by January 2025 (Figure A-13).

MW24-1D was purged dry in February, April, and July in support of establishing a sampling methodology and estimating hydraulic conductivity in the bedrock surrounding the screen intervals. The water level in MW24-1S dropped in apparent response to purging of MW24-1D, and remained below or close to the bottom of the well screen through 2025. Water level recovery in MW24-1D was slow, and at the end of 2025 water levels in both wells were about five metres below the water levels measured in January 2025.

The slow recovery in these wells suggests that the hydraulic conductivity of the bedrock these wells are screened in is very low. The relative water level responses indicate there is likely a discrete connection between the two completions. Quarterly water level monitoring should continue during 2026, and samples from each well should be collected with a peristaltic pump when water levels allow.

3.2 GROUNDWATER FLOW IN SURFICIAL SEDIMENTS

As a result of the low bedrock permeability, a large component of the groundwater flow beneath the landfill area is expected to perch above the bedrock and seep laterally through the surficial sediments. Groundwater flow in surficial sediments is limited to the areas discussed below.

3.2.1 Landfill Expansion Areas and Bedrock Gap Along Stirling Arm Logging Road

The largest amount of groundwater seepage at AVL occurs in the sands and gravels beneath the South and East Expansion areas. The saturated thickness of these highly permeable sediments ranges up to about 12 m (Figure 4).

A groundwater flow divide is interpreted to exist in the sands and gravels near the seepage cutoff berm at the west side of the South Expansion Area (Figure 3). No seepage losses are interpreted to occur from the Southeast Expansion Area through this cutoff structure based on the eastward hydraulic gradient (i.e., towards the landfill) on its east side. The above ground water level (i.e., flowing-artesian) in MW94-4S is attributed to a localized flow regime (Figure A-2 and Piteau, 2020).

The largest component of the seepage in surficial sediments beneath the South Expansion Area is towards and into the French drain that maintains the water table at approximately 70 m-geodetic (Figures 3, 5, and A-6). Christie Creek and the PW-2/PW15-2 leachate interception wells are the interpreted discharge points for any groundwater flow in surficial sediments beneath the South Expansion Area that is not intercepted by the French drain. Operation of PW-2 and PW15-2 induces flow from MW02-3S and MW05-1S (Figure A-10).

The lowest water levels in the vicinity of the shallow leachate interception pumping system are expected to be in pumping wells PW-2 and PW15-2. Based on manual water levels and water level data recorded by the SCADA system, the shallow leachate interception pumping system maintained a hydraulic gradient in the surficial sediments towards the landfill throughout 2025, except for an interval with heavy precipitation between late-October and mid-December (Figures A-10 and A-11). The pump controls and alarm system continue to be adjusted to maintain the required water levels in PW-2 and PW15-2 and alert qualified personnel to promptly respond if water levels are above the target water range.

3.2.2 Flow to North in Bedrock Trough

Some northward groundwater flow is interpreted to occur across the north perimeter of the landfill through sand and gravel sediments that have infilled the base of a bedrock trough near MW94-6

and MW98-9. Recharge to this localized flow regime is limited due to the confinement provided by overlying silt and clay moraine sediments, and the northward groundwater flow is intercepted with an interception trench, sump and pumping system north of the landfill perimeter that was commissioned in 1999 (Figures 3 and 4).

Water elevations at MW98-9 and MW98-10 were not collected by the SCADA system in 2025 due to a faulty memory card and equipment damage due to exposure to the elements. Measured water levels at MW98-9 and MW98-10 in March and June indicate that the pumping system was functioning satisfactorily. However, the system was not maintaining the proper gradient at the time of the September and December measurements (Figures A-4 and A-5).

3.2.3 Groundwater Flow Beneath Original Landfill

The groundwater flow regime beneath the original landfill area is interpreted to follow the bedrock topography to the southwest. Since 2007, water levels in BH00-1C and BH00-2C, both with screen completion zones at the base of the waste at the bedrock contact, have indicated a perched water table at the approximate level of the trafficked surface and are, thus, not considered representative of the groundwater flow regime beneath the landfill (Figure A-3). As such, monitoring of water levels in these wells was discontinued in 2021.

4 WATER QUALITY MONITORING RESULTS

Water quality results for all sites monitored in 2025 are summarized in Appendix B and have been compared to the following relevant water quality guidelines, objectives, and standards:

- Guidelines for Canadian Drinking Water Quality (GCDWQ, Health Canada, 2025), which include aesthetic objectives (AOs), operational guideline, and/or maximum allowable concentrations (MACs);
- Working and approved guidelines for freshwater aquatic life (FWAL) in BC (BC MOE, 2025);
- The phosphorus objective developed for Vancouver Island streams (BC MOE, 2014); and
- Standards from the Contaminated Sites Regulation (CSR) for aquatic water (AW) and drinking water (DW) (CSR BC, 2025).

As the CSR AW standards are for groundwater, and assume 10 times dilution before entering surface water, analytic water quality data for natural surface watercourses have been compared to one tenth of the AW standard, which, for convenience, is referred to as “AW/10”.

The dissolved copper and nickel FWAL guidelines, approved in 2019 and 2024 respectively, are dependent on sample pH, temperature, dissolved organic carbon (DOC), humic acid (HA) content, alkalinity, and major cation and anion concentrations. Similarly, updated guidelines for total aluminum and dissolved zinc developed in 2023 vary with hardness, pH and DOC, and an updated guideline for total lead developed in 2024 varies with hardness and DOC. Site-specific FWAL guidelines for all parameters listed above were developed based on parameters measured in 2020 through 2022. When 2020 through 2022 sampling results are not available, parameters measured in 2023 are used. Site-specific hardness, pH, DOC and temperature values used to calculate guidelines and standards are indicated on the tables in Appendix B.

Average concentrations of key leachate indicator parameters at sites monitored in 2025 are presented in Table 2, and exceedances of guidelines, objectives, and standards for each monitoring site are presented in Table 3. Time-series plots for key parameters are presented in Appendix B. Relative concentrations of major cations and anions for each sampling site are also displayed on Piper trilinear diagrams to enable graphical comparison of the dominant anion and cation facies, assessment of chemical evolution of water quality, and identification of sample collection sites with similar water chemistry (Figure 6). Except for minor excursions of the pH ranges from the GCDWQ operational guideline and BC FWAL, exceedances of guidelines, objectives, and standards are discussed in the following sections. Metals results described in the following sections refer to dissolved metals for groundwater samples and total metals for surface water samples (Table 1).

4.1 LEACHATE

Leachate quality is monitored where the French drain below the original landfill flows into the aeration lagoon (lagoon inlet), and at the discharge point from the French drain in the

South Expansion Area (expansion area drain; Figure 2). The low permeability of the landfill foundation causes most of the leachate to seep into the two drains. Due to dry conditions in June and September 2025, the lagoon was only sampled in March and December. The December sample was also analyzed for volatile organic carbons (VOCs), phenol, and acid extractable analyses. The expansion area drain was sampled quarterly.

4.1.1 Inorganic Chemistry

The leachate sampled from the lagoon inlet is characterized by neutral pH, high EC and alkalinity, and elevated concentrations of chloride, iron, manganese and ammonia (Tables 2 and B-1). Dilution at the sampling point for the lagoon inlet is about 2:1 (Piteau, 2020). Chloride concentrations at the lagoon inlet in 2025 averaged 85 mg/L (Table 2 and Figure B-1). They have generally declined since 2017.

Although ammonia concentrations in leachate samples collected at the lagoon inlet in March and December 2025 exceeded the FWAL guideline (1.84 mg/L-N) and the CSR AW standard (11.3mg/L-N; Tables 3, B-1), the decreasing trend first observed in 2018 continues (Figure B-2). Nitrate concentrations exceeded the FWAL guideline (3 mg/L-N) in both samples.

Ranging up to 3.17 and 3.13 mg/L, respectively (Tables B-1 and 3), concentrations of iron and manganese in leachate samples collected at the lagoon intake exceeded their respective GCDWQ AO or MAC values and FWAL guidelines in the samples collected in March and December. Manganese also exceeded the CSR DW standard in both samples. All other analysis results for 2025 indicate concentrations below the appropriate guidelines and standards, with the following exceptions:

- Total dissolved solids (TDS) in the February lagoon inlet leachate sample (525 mg/L) exceeded the 500 mg/L GCDWQ AO;
- Cobalt in both lagoon inlet samples exceeded the FWAL guideline of 0.00063 mg/L by factor of 4. It also exceeded the CSR DW standard; and
- Copper in both lagoon inlet samples exceeded the site-specific FWAL guideline for dissolved copper of 0.0013 mg/L by factors of 3 to 4.

COD at the lagoon inlet has typically ranged between 10 and 220 mg/L-O since 1998, and the higher values are attributed to elevated suspended sediment (Figure B-3). COD concentrations at this sampling location in 2025 were 71 mg/L-O in March and 11 mg/L-O in December (Table B-1).

Overall, the leachate strength at the lagoon inlet appears to be relatively constant, subject to some seasonal and climatic variations. The data do not indicate any increasing trends that would raise concerns regarding future changes in the leachate character.

Samples collected from the expansion area drain are representative of very dilute leachate, which is due to the small fraction of the catchment overlain by waste (Table B-1 and Figures B-1 to B-3). All 2025 analyses results met receiving water criteria except:

- Nitrate exceeded the FWAL guideline by a factor of 1.2 in the September sample;
- Ammonia exceeded the FWAL guideline by factors up to two in all four samples;
- Phosphorus exceeded the summer Vancouver Island phosphorus objective in the September sample;
- Iron exceeded the GCDWQ AO in the June sample;
- Manganese exceeded the FWAL guideline, GCDWQ AO and MAC, and CSR DW standard in all four samples;
- Cobalt exceeded the CSR DW standard in two of the samples, and the FWAL guideline by factors of 1.3 to 3.2 in three of the samples; and
- Copper exceeded the site-specific dissolved copper FWAL guideline by factors of 1.2 to 2.3 in all four samples.

The elevated ammonia concentrations in the samples from the expansion area drain indicate that leachate is being intercepted by the drain. Drain discharge reports to the flow equalization pond.

4.1.2 Organic Chemistry

In 2025, leachate samples for organic chemistry were collected on December 1 from the lagoon inlet and September 15 from the expansion area drain. The December 1 sample from the lagoon inlet was also submitted for phenol and acid extractable analyses. Results for volatile organic compounds, semi-volatile organic compounds, polycyclic aromatic hydrocarbons, and phenolics indicate concentrations of most compounds below reported detection limits, or all applicable standards and guidelines (Tables B-2, B-3, and B-4).

4.1.3 Per- and Polyfluoroalkyl Substances

Per-and Polyfluoroalkyl substances (PFAS) were not analyzed in 2025 as the lagoon inlet was dry during the July sampling event. PFAS analysis results for samples collected from the expansion area drain in October 2021 and the lagoon inlet in July 2023 indicated concentrations of all compounds were below developed guidelines (Piteau, 2022 and 2024).

4.2 GROUNDWATER IN SURFICIAL SEDIMENTS

Background groundwater quality in surficial sediments has been historically characterized using analysis results for samples from MW94-2S and MW94-3S on the southeast side of the landfill, and MW02-1S (replaced by MW23-2) and MW02-2 on the south boundary of the landfill. Eight monitoring wells and two pumping wells sampled in the 2025 program are screened in surficial sediments. These include MW02-3S, MW05-1S, PW-2 and PW15-2 on the southeast side of the Landfill, MW94-4S on the west side, and MW94-6S, MW98-9, MW98-10, MW23-1S, and MW23-1D on the north side. Analytical results for samples from these wells provide information on groundwater quality along the potential seepage pathways in surficial sediments that have been identified at the site.

4.2.1 Background Chemistry South and Southeast of Landfill

Based on historical water quality data from samples at MW94-2S, MW94-3S, MW02-1S and MW02-2, and 2024 and 2025 water quality data from MW23-2, background chemistry in the surficial sediments is characterized by low chloride (1 to 3 mg/L; Figures B-4 and B-6) and nitrate (<0.5 mg/L-N; Figures B-5 and B-7). MW94-2S was decommissioned and replaced by MW02-3S (Section 4.2.2) in 2002. MW02-1S was damaged in 2015 and replaced by MW23-2 in October 2023. MW02-2 was damaged in 2011.

Four samples were collected at MW23-2 in 2025. The March and June samples exceeded the BC FWAL guideline for copper, and the June sample exceeded the BC FWAL guideline for mercury (Table B-27). No effects from the landfill, road work, or other industries are evident from surficial sediment monitoring results south and southeast of the landfill.

4.2.2 Southeast Side of Landfill (MW02-3S, MW05-1S, PW-2 and PW15-2)

Chloride concentrations for MW02-3S, located on the east side of the flow equalization pond, increased from background levels of less than 20 mg/L prior to 2016 to about 90 mg/L in 2020 (Table B-5 and Figure B-4). The slight decrease in concentrations since early 2021 coincides with operation of the leachate interception wells. The mean chloride concentration in 2025 was 67 mg/L. Other leachate indicators at this sample location, including EC and TDS, have also been elevated in recent years, with 2025 values averaging 1095 µS/cm and 676 mg/L, respectively (Table 2). Nitrate and ammonia remained low at this location in 2025 (Figure B-5).

In addition to the TDS exceedances of the GCDWQ AO (500 mg/L), the following exceedances were noted for MW02-3S for 2025 (Tables 3 and B-5):

- Manganese concentrations exceeded the 0.02 mg/L GCDWQ AO and 0.12 mg/L MAC, but remained below the FWAL guideline and CSR DW standards in all samples;
- Iron concentrations exceeded the 0.1 mg/L GCDWQ AO in the September sample;
- Cobalt concentrations exceeded the site-specific FWAL guideline and CSR DW standard in all samples; and
- Arsenic concentrations in the September and December sample exceeded the FWAL guideline, but remained below the CSR standards.

Rising EC and chloride indicate an increase in leachate effect at MW02-3S that coincides with a period of little to no operation of PW-2. EC and chloride concentrations declined slightly when PW-2 was recommissioned in late-2020 (Figures A-8 and B-4). Chloride, EC and TDS concentrations have been relatively steady since 2022 but are expected to drop with the recommended operation of the shallow leachate interception system.

Comparing 2025 water quality data to those from previous years, it appears that labels for the June and December 2025 samples from MW05-1S and MW05-1D were switched. The results have been reassigned to the correct sample location (Table B-16). Chloride, EC, and TDS are typically lower

at MW05-1S than at MW02-3S (Table 2 and Figure B-4), indicating reduced leachate effects at MW05-1S. Nitrate at MW05-1S has typically remained below the 3 mg/L FWAL, but concentrations have increased since 2022. Nitrate concentrations exceeded the FWAL guideline for all four samples by factors of 2 to 3 in 2025 and all TDS results were above the 500 mg/L GCDWQ AO (Tables 3, B-16 and Figure B-5).

When operating, PW-2 and PW15-2 intercept easterly migration of groundwater and leachate in overburden and pump it to the flow equalization pond. Except for the interval between late-October to mid-December, available water level data indicates pumping of these wells maintained a hydraulic gradient towards the landfill in 2025 (Section 3.2.1).

All four pumping well samples collected in 2025 were from PW-2. There is significant variability in the analysis results (Figures B-4 and B-5), with peak concentrations typically occurring during the summer sampling event. Chloride concentrations at PW-2 have dropped since 2019 with the renewed operation of the pumping system (Figure B-4). In 2025, chloride concentrations in samples from PW-2 exceeded one or more guidelines in the June sample (280 mg/L) and the September sample (156 mg/L). Ammonia concentrations were also elevated in 2025, with a maximum of 119 mg/L-N reported in June. All four samples exceeded the FWAL guideline of 1.84 mg/L-N, and the June, September and December samples also exceeded the CSR AW standard of 18.4 mg/L-N.

Manganese concentrations in samples from PW-2 exceeded the GCDWQ AO and MAC, FWAL guideline, and CSR DW standard by considerable margins in 2025 (Tables 3 and B-18). Other parameters with one or more exceedance in 2025 include:

- TDS exceeded the GCDWQ AO of 500 mg/L in all samples except the sample collected in March;
- Sodium concentrations in the June sample (232 mg/L) exceeded the FWAL guideline and CSR DW standard of 200 mg/L;
- Arsenic concentration in the June sample (0.0093 mg/L) exceeded the FWAL guideline (0.005 mg/L);
- Boron concentrations in the June sample (1.94 mg/L) exceeded the FWAL guideline of 1.2 mg/L;
- Cobalt concentrations in all samples except March exceeded the FWAL guideline (0.00085 mg/L) and the CSR DW standard (0.001 mg/L);
- Copper concentrations in all samples except March exceeded the 0.0124 mg/L site-specific FWAL guideline, and one exceeded the 0.09 mg/L CSR AW standard; and
- Iron concentrations in the June sample (27.4 mg/L) exceeded the GCDWQ AO (0.1 mg/L), the FWAL guideline (0.35 mg/L) and the CSR DW standard (6.5 mg/L);
- Nickel concentration in June and September exceeded the site-specific FWAL guideline (0.018 mg/L) by factors of 5 and 2.8 respectively, the June sample also exceeded the CSR DW standard (0.08 mg/L); and

- Zinc concentrations in June and December exceeded the site-specific FWAL guideline (0.16 mg/L), while the September sample exceeded the site-specific FWAL guideline and the CSR DW (3 mg/L) and AW (2.4 mg/L) standards.

PW15-2 was not sampled in 2025, as PW-2 was the active pumping well for all four sampling events. Of the four active surficial sediment monitoring locations on the southeast side of the landfill, PW-2 displayed the most significant leachate effect. Continued operation of the shallow leachate pumping system will induce groundwater flow to the leachate interception wells and continue to reduce the apparent landfill effects at MW02-3S.

4.2.3 West Side of Landfill (MW94-4S)

MW94-4S was sampled in March, June, and September in 2025, but was not sampled in December due to restricted site access. Chloride concentrations at MW94-4S in 2025 remained low, except for the June sample (23.4 mg/L), which had an anomalously high result (Figure B-6 and Table 2). Nitrate values have remained low, with all results below 0.1 mg/L-N (Figure B-7 and Table B-7). Consistent with previous years, arsenic and boron concentrations regularly exceeded FWAL guidelines (0.005 mg/L and 1.2 mg/L, respectively), but remained below the GCDWQ MAC, and CSR DW and AW standards. Lithium concentrations for all three samples exceeded the CSR DW standard (0.008 mg/L).

Although analyses results for groundwater samples from MW94-4S have indicated significant elevated chloride, the absence of any prolonged nitrate or ammonia effects indicate a non-leachate source. This monitoring well is located within 20 m of the Stirling Arm Logging Road and is likely affected by road maintenance practices.

4.2.4 North Side of Landfill (MW94-6S, MW98-9, MW98-10 and MW23-1S)

Chloride concentrations at MW94-6S have generally declined since the leachate interception trench was commissioned in 1999 and ranged between 5.68 and 13.7 mg/L in 2025 (Table B-10 and Figure B-8). Similar to the MW05-1S and MW05-1D samples (Section 4.2.2), it is assumed the June samples for MW94-6S and MW94-6D were switched, as concentrations measured at MW94-6S in June 2025 are more consistent with past monitoring results for the deep well, and vice-versa. The analytic results have been reassigned based on chemistry (Tables B-10 and B-11). Ammonia in MW94-6S was elevated above the FWAL guideline (1.84 mg/L-N) by factors of 3.7 to 4.6 in 2025 (Figure B-9). TDS in the June sample (624 mg/L) exceeded the GCDWQ AO (500 mg/L). The following dissolved metals exceedances were also noted for 2025 (Table 3):

- June, September and December samples exceeded the FWAL guideline for cobalt (0.00073 mg/L), and the September sample also exceeded the CSR DW standard (0.001 mg/L);
- Lithium concentrations in the March and June samples exceeded the CSR DW standard; and

- Iron and manganese concentrations have generally declined since 2007 (Piteau, 2020), but iron concentrations in the September and December samples exceeded the iron GCDWQ AO and FWAL guidelines. All samples had manganese concentrations above the CSR DW standard, with three (all except March) also exceeding the FWAL guideline.

Groundwater seepage past MW94-6S is expected to be intercepted by the leachate interception trench located immediately downgradient of this monitoring site (Figure 2).

Chloride and nitrate concentrations in groundwater sampled from MW98-9 and MW98-10 have generally been below levels of concern since the leachate interception trench was commissioned in 1999 (Figures B-8 and B-9, and Tables B-12 and B-13). Anomalously high chloride concentrations were measured at MW98-9 in October 2024, September 2025, and December 2025. The high chloride concentration measured in the September 2025 sample from MW98-9 (178 mg/L) was accompanied by elevated metals (described below) but not elevated nitrate or ammonia. Chloride concentrations at MW98-10 for the same sampling events have remained low, but the ammonia concentration in the September sample (2.66 mg/L-N) exceeded the ammonia FWAL (1.84 mg/L-N). No samples were collected from MW98-9 or MW98-10 in June 2025 as both monitoring wells were reported to be dry.

Copper concentrations at MW98-9 exceeded the site-specific FWAL guideline (0.00024 mg/L) for all three samples, and the GCDWQ AO (0.02 mg/L) for two samples. The following exceedances were noted for MW98-9 in the September 2025 sample only (Tables 3 and B-12):

- The GCDWQ AO for TDS (500 mg/L);
- The FWAL guideline for mercury (0.02 mg/L)
- The site-specific FWAL guideline for nickel (0.0026 mg/L)
- The site-specific FWAL guideline for zinc (0.016 mg/L).

The following additional exceedances were noted for MW98-10 in 2025 (Tables 3 and B-13):

- The September 2025 sample concentration exceeded the site-specific FWAL guidelines for cobalt (0.0003 mg/L), nickel (0.001 mg/L), and zinc (0.0071 mg/L). The cobalt concentration also exceeded the CSR DW standard (0.02 mg/L);
- The September 2025 sample also exceeded the iron and manganese GCDWQ AOs (0.1 mg/L and 0.02 mg/L, respectively); and
- The March and December sample exceeded the site-specific FWAL guideline for copper (0.00022 mg/L) and the December sample exceeded for zinc.

With the exception of the September sample at MW98-9, chloride and metals concentrations at MW98-9 and MW98-10 remained low, and typical concentrations for the exceeding metals in leachate are similar to, or lower than metals concentrations in MW98-9 and MW98-10. This supports the conclusion that the relatively elevated metals concentrations typically observed in these wells represent background conditions. The higher concentrations of chloride and metals in MW98-9 may be due to lapses in leachate interception trench operation during the fall months or dry conditions.

Water collected at MW23-1S, located north of the Stevens Creek clay berm, is characterized by circumneutral pH and average EC values of 512 µS/cm (Table 2). Other than elevated concentrations of chloride (42 mg/L) and nitrate (1.23 mg/L-N) in the September sample, concentrations in samples from MW23-1S were comparable to those measured in previous years (Figures 6, B-8 and B-9). The following exceedances were noted for MW23-1S in 2025:

- In September, the cobalt concentration (0.00108 mg/L) exceeded both the site-specific FWAL guideline (0.00070 mg/L) and CSR DW standard (0.001 mg/L);
- Copper concentrations exceeded the site-specific FWAL guideline (0.00070 mg/L) in March, June, and September;
- Iron concentrations exceeded the GCDWQ AO (0.1 mg/L);
- Manganese concentrations in three of four samples (all except December) exceeded FWAL standard (1.55 mg/L) and CSR DW standard (1.5 mg/L) and concentrations in all four samples exceeded the GCDWQ AO guideline (0.02 mg/L); and
- In June, the mercury concentration exceeded the FWAL guideline (0.02 mg/L).

Results from MW23-1S in 2025 are consistent with previous assessments that low levels of leachate are seeping through surficial sediments under the clay berm north of the landfill (Figures 6, B-8 and B-9). Concentrations of all parameters are typically highest in late summer when conditions are dry.

4.3 GROUNDWATER IN BEDROCK

Eleven of the monitoring wells and two of the pumping wells sampled in 2025 are screened in bedrock. These wells include MW02-3D, MW05-1D, PW-1 and PW15-1 on the southeast side of the Landfill, MW94-4D on the west side of the landfill, and MW94-5S, MW94-6D and MW23-1D on the north side of the landfill. Sample results from these wells provide information on the potential leachate effect measured in bedrock at the site. Monitoring wells MW02-1D, MW02-4 provide background chemistry to the west and south respectively, and MW13-1S, MW13-1D, and MW13-2S provide background chemistry to the north of the landfill.

4.3.1 Background Chemistry West and South of Landfill (MW02-1D and MW02-4)

Background bedrock groundwater quality has been measured at 13 monitoring wells since the monitoring program began in 1995. MW02-4 and MW02-1D are the only background wells screened in bedrock that were sampled in 2025. MW02-4 is located adjacent to the landfill access road, west of the landfill, and MW02-1D is located south of the South Expansion Area. Although the MW13-series wells are not considered to be affected by the landfill, they are discussed separately in Section 4.3.5.

Historically, chloride concentrations at MW02-4 ranged from about 50 to 210 mg/L, with the highest concentrations exceeding those measured in the concentrated leachate sample from the lagoon inlet (Figures B-1 and B-8). In 2025, chloride concentrations ranged from 87.1 to 104 mg/L, while

sodium and sulphate concentrations ranged between 43.5 and 60.2 mg/L, and 11.6 and 14.5 mg/L, respectively (Table B-15). The elevated chloride and sodium concentrations are attributed to road maintenance practices or possibly natural background levels.

Results for MW02-1D display a much less mineralized chemistry than MW02-4 (Tables 2, B-14 and B-15). Chloride and sulphate concentrations are generally much lower than in MW02-4, with a maximum chloride concentration of 9.11 mg/L measured in 2025 (Tables 2 and B-14; Figure B-6). Since late 2016, sodium and chloride have been elevated in samples from this well, but concentrations are still well below those at MW02-4 (Table 2, Figures B-6 and B-8). Groundwater at the MW02-1D location may be better "flushed" than at MW02-4.

Dissolved metals concentrations measured in background bedrock sites vary significantly between samples, with iron, manganese, boron, copper, zinc, mercury, cadmium, and arsenic all exceeding receiving water criteria and sometimes leachate concentrations on more than one occasion (Piteau, 2020). The apparently elevated concentrations of metals are attributed to rock mineralogy, localized dissolution of these metals due to disturbances caused by the drilling process, and natural interactions between the rock and groundwater.

Lithium concentrations exceeded the CSR DW standard (0.008 mg/L) in one of four samples (December) at MW02-4 and all four samples at MW02-1D (Table 3, B-14, and B-15). Other exceedances at MW02-1D include the following dissolved metals:

- Arsenic exceeded the FWAL (0.005 mg/L), GCDWQ MAC (0.01 mg/L) and CSR DW (0.01 mg/L) guidelines and standards in all four samples;
- Boron concentrations exceeded the FWAL guideline (1.2 mg/L) for all four samples; and
- Tungsten concentrations exceeded the CSR DW standard (0.003 mg/L) for all four samples.

Based on the 2025 and historical sampling results, background chemistry of groundwater in the bedrock can be characterized as mixed-sodium bicarbonate type (Figure 6) with varying TDS, reflective of the residence time in the ground and the mineralogy of the rock mass along the groundwater flow path. Background chloride concentrations at MW02-1D are interpreted to be below 5 mg/L but may have been affected by road maintenance practices in recent years (Figure B-6). Background chloride concentrations at MW02-4 typically range from 75 to 125 mg/L, and ammonia concentrations are below 0.5 mg/L-N (Figures B-8, B-9 and Table B-15).

4.3.2 Background Chemistry Northeast of Landfill (MW13-1 and MW13-2)

Water quality results for the monitoring wells installed on the northeast side of the leachate interception channel are indicative of a sodium-sulphate type chemistry with elevated TDS and EC (Figure 6 and Tables 2, B-19, B-20).

Groundwater in MW13-1D and MW13-1S is highly mineralized (Piteau, 2019). Chloride in samples from both monitoring wells has been trending upwards, likely due to a drying weather trend in recent years (Figure B-10). These concentrations are slightly greater than background concentrations

observed elsewhere and likely indicate that these monitoring wells are close to a groundwater flow divide where the flow regime is poorly flushed (Figure 3).

The chemistry in MW13-2S has shown some variability. Based on water level trends (Figure A-12) and variation in nitrate and ammonia concentrations (Figure B-11), it is possible that MW13-2S has a discrete connection to the leachate interception/conveyance channel (Piteau, 2020).

Monitoring results for analyzed parameters at MW13-2S were within relevant standards and guidelines in 2025, except for the December sample nitrate concentration (6.62 mg/L-N) which exceeded the FWAL guideline (3 mg/L-N) (Tables 3 and B-19). MW13-1S had TDS concentrations exceeding the GCDWQ AO in all four samples, and the June and September chloride concentrations exceeded the BC FWAL guideline (150 mg/L) (Table B-19).

Annual samples from MW13-1D are submitted for a larger sampling suite than those from MW13-1S and MW13-2S. The following exceedances were observed at MW13-1D (Table B-20), which was sampled in September 2025:

- TDS exceeded the GCDWQ AO (500 mg/L);
- Chloride exceeded the FWAL guideline (150 mg/L);
- Iron exceeded the GCDWQ AO (0.1 mg/L) and the FWAL guideline (0.35 mg/L);
- Manganese exceeded the GCDWQ MAC (0.12 mg/L), the FWAL guideline (0.61 mg/L), and the CSR DW (1.5 mg/L);
- Lithium exceeded the CSR DW standard (0.008 mg/L); and
- Nickel exceeded the updated site-specific FWAL (0.008 mg/L).

Ammonia concentrations slightly decreased at MW13-1D in 2025. Similar to MW13-2S, it is possible there is a discrete connection to the leachate interception/conveyance channel.

4.3.3 Southeast Side of Landfill (MW02-3D, MW05-1D, PW-1 and PW15-1)

Chloride concentrations at MW02-3D have consistently tracked those in MW02-3S (Figure B-4). Elevated chloride at MW02-3D is attributed to pumping of the bedrock interception wells, which have induced downward seepage from the surficial sediments at this location (Figures A-8 through A-11). It is expected that chloride concentrations at MW02-3D and MW02-3S will drop with the recommended operation of the interception well system. Nitrate was not measured above 0.0385 mg/L-N in 2025 at MW02-3D. The ammonia concentration in the March sample from MW02-3D (3.66 mg/L-N) exceeded the FWAL guideline (1.84 mg/L), but all other values were low (Table B-6, Figure B-5). Dissolved metals exceedances at MW02-3D in 2025 include:

- Iron exceeded the GCDWQ AO (0.1 mg/L) in the September sample;
- Manganese exceeded the GCDWQ AO (0.02 mg/L) and MAC (0.12 mg/L) in all samples, and the March sample showed manganese concentration exceeded the CSR DW standard (1.5 mg/L);

- Cobalt exceeded the site-specific FWAL guideline (0.00096 mg/L) and CSR DW guideline (0.001 mg/L) in three of four samples (all except December); and
- Lithium exceeded the CSR DW standard (0.008 mg/L) in all four samples (Table B-6).

Chloride concentrations at MW05-1D[2] have shown a delayed response to pumping of PW-1, increasing following a period of well operation and slowly declining when the well is not operating (Figures A-8 and B-4). These trends also suggest operation of the bedrock wells (PW-1 and PW15-1) induces shallow groundwater to seep down into bedrock in the area surrounding the well. Chloride concentrations at MW05-1D averaged 44 mg/L (Table 2) and TDS remained elevated in 2025, with all samples exceeding the 500 mg/L GCDWQ AO (Table 3 and B-16). Nitrate and ammonia concentrations have generally remained low, with maximum concentrations of 0.041 mg/L-N and 1.47 mg/L-N, respectively, during 2025. A very slight apparent rise in ammonia concentration may be following the rise in chloride concentrations noted in previous years. Samples from MW05-1D are not submitted for dissolved metals analyses.

Samples from the bedrock leachate interception system in 2025 were collected from PW15-1 in September, and from PW-1 in March, June, and December (Table B-17). Leachate indicator parameters in samples from these points were slightly higher than those measured in MW02-3D in 2025 and significantly higher than those in MW05-1D (Table 2, Figures B-4 and B-5). The chloride concentration at PW15-1 in September exceeded the FWAL guideline, and TDS concentrations from the bedrock pumping wells were elevated, with all four samples exceeding the GCDWQ AO. Nitrate concentrations remained low, while all four ammonia concentrations exceeded the FWAL guideline (1.84 mg/L-N; Table 3). Elevated chloride and TDS concentrations indicate that when pumping, this well intercepts relatively deep groundwater flow that has been affected by leachate which has seeped into the bedrock.

Dissolved metals exceedances at PW-1 and PW15-1 are limited to the following:

- Arsenic exceeded the FWAL guideline (0.005 mg/L) in the December PW-1 sample;
- Cadmium exceeded the FWAL guideline (0.00053 mg/L) in the September PW15-1 sample;
- Cobalt exceeded the CSR DW standard (0.001 mg/L) and the site-specific FWAL guideline (0.00085 mg/L) in all four samples from the pumping well system;
- Copper exceeded the site-specific FWAL guideline (0.0022 mg/L) for all pumping wells samples and the September sample also exceeded the CSR AW standard (0.09 mg/L);
- Iron exceeded both the GCDWQ AO (0.1 mg/L) and the FWAL guideline (0.35 mg/L) in the June sample.
- Lithium exceeded the CSR DW standard (0.008 mg/) for all samples collected from the pumping system;

[2] Sample results at MW05-1S and MW05-1D for June and December have been reassigned to the correct sample based on chemistry following an apparent labelling error.

- Manganese exceeded all applicable guidelines and standards at the pumping system with a maximum concentration of 5.35 mg/L;
- Mercury exceeded the FWAL guideline (0.02 mg/L) in the March and June samples;
- Nickel exceeded the site-specific FWAL guideline (0.012 mg/L) and the CSR DW and AW standards (0.08 mg/L and 1.58 mg/L) in the September sample; and
- Zinc exceeded the site-specific FWAL guideline (0.079 mg/L) in the June and September samples, and the CSR DW (3 mg/L) and AW (2.4 mg/L) standards in the September sample (Table B-17).

4.3.4 West Side of Landfill (MW94-4D)

MW94-4S was sampled in March, June, and September in 2025, but was not sampled in December due to restricted site access. Monitoring data for bedrock piezometer MW94-4D typically display very similar chloride data to MW94-4S, which is screened in surficial sediments (Tables 2, B-7, B-8 and Figure B-6). Nitrate concentrations at MW94-4D are typically higher than those measured in MW94-4S and have fluctuated below 1 mg/L-N since 2009 (Figure B-7). Although current monitoring data indicate some very minor leachate effect in MW94-4D, leachate migration in this direction is not considered to be significant. Water level data indicate that there is no shallow migration in this direction (Section 3.2.1). There were no exceedances of water quality guidelines and standards at MW94-4D in 2025.

4.3.5 North Side of Landfill (MW94-5S, MW94-6D and MW23-1D)

Recent chloride concentrations measured at MW94-5S, MW94-6D [3] and MW23-1D are at background levels (Figure B-8), indicating little leachate effect in bedrock on the north side of the landfill. Similarly, nitrate and ammonia concentrations in MW94-5S, MW94-6D and MW23-1D (Tables B-9, B-11 and B-25, Figure B-9) are well below levels of concern (Tables B-10 and B-11).

Exceedances of water quality guidelines or standards at MW94-5S in 2025 were limited to an exceedance of the site-specific FWAL guideline for copper for the March sample, and an exceedance of the GCDWQ AO for manganese in the December sample (Tables 3 and B-9). The 2025 samples from MW94-6D had the following exceedances (Tables 3 and B-11):

- TDS exceeded the GCDWQ AO for three of four samples (all except March);
- Arsenic exceeded the GCDWQ MAC, FWAL guideline, and CSR DW standard for all four samples. These elevated arsenic concentrations are considered to be indicative of background concentrations (Piteau, 2020);
- Boron exceeded the FWAL guideline in all samples;
- Cadmium exceeded the FWAL guideline in the June and September samples;
- Iron exceeded the GCDWQ MAC in the March and December samples;
- Lithium exceeded the CSR DW standard in all samples;

[3] Sample IDs for MW94-6S and MW94-6D for the June sample have been reassigned based on chemistry following an apparent labelling error.

- Mercury exceeded the FWAL guideline in three of four samples (all except March); and
- Tungsten exceeded the CSR DW standard in all samples.

The 2025 samples from MW23-1D had the following exceedances:

- Iron exceeded the GCDWQ MAC in the June sample;
- Manganese exceeded the GCDWQ MAC and AO in all four samples; and
- Lithium exceeded the BC DW standard in the September sample (Tables 3 and B-25).

Given the low chloride, nitrate, and ammonia levels measured at these wells and their relative plotting positions on the Piper plots (Figure 6), the above exceedances at MW95-S and MW94-6D are attributed to background bedrock water quality. Groundwater composition at MW23-1D has a similar signature to the leachate, but at very low concentrations, and exceedances are attributed to a combination of background water quality with possible leachate effect. Based on data for MW945-S and MW94-6D, leachate effects to groundwater in bedrock at the north property line are interpreted to be very slight.

4.4 CREEKS

Prior to landfilling, the majority of the AVL site would have drained to the north via a small seasonal creek (Stevens Creek) and a portion of the site would have drained to the east towards Christie Creek. Leachate migration towards Stevens Creek is mitigated with a French drain beneath the landfill to maintain low water levels in the landfill area, and a clay berm at the northwest corner of the landfill to prevent surface flow into this drainage course (Figure 2). Leachate migration towards Christie Creek is controlled with the leachate interception well pumping system. Heath Creek is sampled to provide background water quality.

4.4.1 Heath Creek

Heath Creek is located west of the landfill, opposite to the interpreted principal direction of subsurface migration (Figure 3). There have been no indications of leachate effect to Heath Creek (Table B-21).

The slight increase in chloride concentrations in Heath Creek noted in 2022 and 2023 is attributed to drier than average weather and a possible change in road maintenance practices. Concentrations dropped to previous levels in 2024, and remained there for 2025 except for the September sample which was anomalously high (19.1 mg/L; Figure B-12). Nitrate and ammonia concentrations have not exceeded 0.3 mg/L-N since the start of the monitoring record and ammonia concentrations are typically less than 0.15 mg/L-N (Table B-21 and Figure B-13). EC values also remained within the historical range, except for the September sample which, similar to chloride concentrations, was anomalously high (Figure B-14).

Aluminum concentrations in Heath Creek are typically similar to or higher than those measured in leachate and are attributed to background water quality. Results for copper exceeded the

site-specific FWAL guideline in the September sample in 2025. Iron concentrations exceeded the GCDWQ AO (0.1 mg/L) in all four samples, and manganese concentrations exceeded the GCDWQ AO in the September sample. The zinc concentration exceeded the site-specific FWAL guideline and CSR AW/10 standard in the June sample. The phosphorus concentration exceeded the summer Vancouver Island phosphorus objective in the June sample (Tables 3 and B-21).

4.4.2 Stevens Creek

Stevens Creek is the most likely of all the local creeks to be affected by seepage from the landfill, as it rises just below the berm at the northwest corner of the landfill footprint (Figure 2). The water quality in this creek, sampled at the property boundary, has displayed some slight leachate effects on occasion.

Due to dry conditions in 2025, Stevens Creek was not sampled in June and September. Chloride, nitrate, and ammonia concentrations in Stevens Creek for 2025 were all below guidelines and close to background levels, with respective average concentrations of 2.7 mg/L, 0.13 mg/L-N, and 0.013 mg/L-N (Tables 2, B-22, Figures B-12 and B-13).

The following metals exceedances were noted in the March 2025 sample:

- Aluminum exceeded the site-specific FWAL guideline for dissolved aluminum;
- Chromium exceeded the CSR AW/10 standard;
- Cobalt exceeded the FWAL guideline;
- Copper exceeded the site-specific FWAL guideline and the CSR AW/10 standard;
- Iron exceeded the FWAL guideline and GCDWQ AO; and
- Manganese exceeded the GCDWQ MAC and AO (Table B-22).

4.4.3 Christie Creek

Water quality in Christie Creek has improved significantly since discharge from the aeration lagoon was diverted to the leachate pipeline in 1998, and a berm was constructed to mitigate shallow seepage around the south side of the flow equalization pond in 1999 (Figures B-12, B-13 and B-14). In 2025, all leachate indicator concentrations remained low, and were similar in upstream (U/S) and downstream (D/S) samples (Tables 2, B-23, and B-24). The sites were dry in June and July when concentrations are typically highest. In December, there was no access to the downstream site due to trail overgrowth.

Iron and manganese concentrations at Christie Creek D/S exceeded GCDWQ AOs for the March sample. Christie Creek U/S had one iron GCDWQ AO exceedance in March, and no manganese exceedances. Maximum concentrations for iron and manganese of 0.33 and 0.035 mg/L were indicated in the downstream sample compared to 0.15 and 0.011 mg/L, respectively, for the upstream samples. The variation between upstream and downstream results is attributed to natural background variability, and some leachate effects.

Samples from both Christie Creek sites regularly exceed the site-specific FWAL guideline for copper by factors of up to two (Tables 3, B-23 and B-24). Copper concentrations are usually measured at relatively low levels close to the FWAL guidelines, with similar values at both sites. However, zinc concentrations at Christie Creek U/S are typically higher than Christie Creek D/S. In 2025, all zinc concentrations exceeded the site-specific FWAL guidelines and CSR AW/10 at both sites. Copper and zinc exceedances are attributed to background water quality.

Similar to Heath Creek, aluminum concentrations above the FWAL guideline are regularly reported for the upstream and downstream samples at levels over double those measured in the leachate samples and are attributed to background water quality. In 2025, the March sample at Christie Creek D/S exceeded the aluminum FWAL guideline.

4.5 DOMESTIC WELLS

The chemistry of the deep bedrock well (DW-A) was very similar to the MW13-series wells on the northeast side of the landfill (Figure 6). As such, the water sample collected in 2025 from this well had elevated TDS (1160 mg/L, compared to the 500 mg/L GCDWQ MAC), and chloride, sodium, arsenic, boron, and lithium concentrations exceeded the GCDWQ MAC and/or CSR DW standards (Table B-28). Nitrate was measured at 0.129 mg/L-N. The highly mineralized chemistry and metals exceedances are attributed to background bedrock chemistry (Section 4.3.5) and are not considered to be landfill effects.

In contrast to the samples collected from the deep bedrock well (DW-A), the samples from the shallow dug wells (DW-B through DW-F) are calcium bicarbonate type and show similar chemistry to the surface water and surficial sediment wells located northeast of the landfill. No excursions of the GCDWQ were measured in the 2025 samples, other than slightly low pH values at DW-B, DW-C, DW-D, DW-E and DW-F, compared to the GCDWQ AO range (7.0 to 10.5).

Domestic well sampling results correspond with results measured at the domestic wells from 1994 to 1996 and since 2022. No indication of leachate effect is evident at any of the six domestic wells.

5 SUMMARY

5.1 2025 ACTIVITIES

Optimization of the leachate pumping and SCADA monitoring system continued through 2025 to maintain a hydraulic gradient towards the landfill from the east boundary. ACRD personnel are working with contractors to assess the pumping and monitoring system and determine an appropriate maintenance schedule to ensure the system continues to function as designed.

Water levels at MW24-1S and 1D, installed east of the landfill, were monitored throughout 2025. These wells will be sampled in 2026 as water levels allow (Table 1).

5.2 GROUNDWATER FLOW

Groundwater flow in the limited surficial sediments beneath the landfill property is interpreted to dominate the flow regime due to the low hydraulic conductivity of the bedrock. Flow in surficial sediments to the north of the landfill is captured with a clay berm and interception trench pumping system. The French drain in the South Expansion Area directs seepage to the flow equalization pond, and the seepage cut-off wall/berm at the west of the property intercepts seepage that may have migrated west to Heath Creek. Seepage east of the property is intercepted by the leachate interception wells.

The leachate interception wells control the migration of leachate towards Christie Creek. Water levels recorded by the SCADA system indicate shallow leachate interception wells PW-2 and PW15-2 provided adequate containment in 2025 except for approximately seven weeks between late-October and mid-December. The pump controls and alarm system continue to be adjusted to maintain the required water levels in PW-2 and PW15-2 and alert qualified personnel to promptly respond if levels are not achieved. Bedrock pumping wells PW-1 and PW15-1 have operated as intended to maintain a hydraulic gradient towards the landfill since PW-1 was recommissioned in May 2020.

5.3 WATER QUALITY

5.3.1 Leachate and Groundwater

Current leachate indicator concentrations are typical for a landfill of this size and age. Samples from the French drain in the South Expansion Area indicate no significant landfill effects except for slightly elevated ammonia concentrations.

Leachate effects in surficial sediments were only noted at MW94-6S on the north side of the landfill, and at PW-2/PW15-2, MW02-3S, and MW05-1S near the flow equalization pond. Flow past MW94-6S is captured by the north leachate interception trench and pumping system. Minor effects by the pond can be mitigated with the operation of PW-2 and PW15-2, as described in Section 6.3. Data for bedrock monitoring wells sampled in 2025 indicate no leachate effects have occurred to the south and only slight leachate effects have occurred to the west, north, northeast and east of the present landfill footprint.

Six domestic wells northeast of the landfill were sampled in 2025. No indication of leachate effect was measured at any of the wells.

5.3.2 Creeks

As in previous years, no leachate effects were detected in Heath Creek in 2025. Water quality results from this site in 2025 complied with receiving surface water criteria except for phosphorus, copper, and zinc.

Due to the dry conditions in June and September, only two samples were collected from Stevens Creek. No samples were collected in the summer months when concentrations are typically highest. Water quality results from this site in 2025 complied with receiving surface water criteria except for aluminum, chromium, cobalt, copper, and iron.

Water quality in Christie Creek has improved significantly since the discharge from the aeration lagoon was diverted to the leachate pipeline in 1998. In 2025, water quality complied with all receiving surface water quality criteria, except for aluminum, copper and zinc, which are unlikely to be associated with leachate.

6 RECOMMENDATIONS

6.1 MONITORING PROGRAM

The monitoring program should continue through 2026 in accordance with Table 1. As noted, the sampling frequency for MW13-1S can be reduced from quarterly to annually. MW13-2S should continue to be sampled quarterly until a relatively stable chemistry is observed. Sampling the domestic wells northeast of the landfill should continue on an annual basis if desired by the homeowners. Extra care should be taken when collecting samples to ensure the samples are decanted to the correct pre-labelled bottles.

A sample from the lagoon inlet should be collected and analyzed for PFAS in mid-summer 2026 if water is present. Should the lagoon inlet have insufficient water in mid-summer, no PFAS samples are required for 2026. Sampling precautions recommended in the “British Columbia Field Sampling Manual – Part E2, SOP-E2-07” (BC, 2020) should be followed, including analysis of field blanks. If any contaminants are detected at concentrations of concern, the monitoring program should be adjusted accordingly.

If the lagoon inlet is dry in the summer of 2026, samples should be collected at the fall sampling event for VOCs, and phenol and acid extractable analyses.

6.2 MONITORING WELL REPLACEMENT

The standpipes in the existing landfill (BH00-1C and BH00-2C) are bent or broken off below ground and water levels in these wells are indicative of a perched water table close to the elevation of the trafficked surface where they were originally completed. A multi-level piezometer should be constructed to replace the existing damaged piezometers. This should comprise of a 50 mm diameter standpipe with a screen interval positioned at the base of the waste to facilitate collection of water samples, and multi-level vibrating wire piezometers to measure piezometric levels at two or three intermediate depths within the waste. A datalogger should be installed in the standpipe, and together with the vibrating wire piezometers, should be connected to the SCADA system to enable water level fluctuations and responses to rainfall events to be quantified. Samples should be collected from this monitoring well on a quarterly basis and analyzed for the same suite as the lagoon inlet samples.

6.3 LEACHATE MANAGEMENT SYSTEMS

The SCADA system should be maintained to record water levels and pumping rates in each leachate interception well (PW-1, PW-2, PW15-1, PW15-2). These data should be monitored to allow for ongoing evaluation of the interception well system and periodic adjustments to the pumping controls (Piteau, 2017). An alert should be sent by the SCADA system to ACRD if the required levels are not maintained in the pumping wells so the problem can be identified and rectified immediately.

SCADA equipment recording water levels at several monitoring wells have failed due to exposure to the elements. It is recommended that service be restored to MW98-9 and MW98-10 to facilitate real-time monitoring and immediate response to pump failure on the north boundary of the landfill. Restoring the functionality of the SCADA system at MW02-3S and MW02-3D is also recommended to allow for ongoing evaluation of the leachate interception wells (PW-1, PW-2, PW15-1, PW15-2).

Flow data from the leachate drains and the leachate pipeline to the Port Alberni Sewage Treatment Facility are also measured. These should be reviewed and reported annually.

7 LIMITATIONS

Piteau Associates Engineering Ltd. has exercised reasonable skill, care and diligence in obtaining, reviewing, analyzing, and interpreting the information acquired during this study, but makes no guarantees or warranties, expressed or implied, as to the completeness of the information contained in this report. Conclusions and recommendations provided in this report are based on the information available at the time of this assessment.

In preparing the recommendations contained herein, Piteau has relied on information and interpretations provided by others. Piteau is not responsible for any errors or omissions in this information. This report is comprised of text, tables, figures and appendices, and all components must be read and interpreted in the context of the whole report. The report has been prepared for the sole use of the Alberni-Clayoquot Regional District and no representation of any kind is made to any other party.

We trust this report adequately presents and discusses the leachate sampling data collected to date. If you wish to discuss the 2025 sampling results, please contact the undersigned.

Respectfully submitted,

PITEAU ASSOCIATES ENGINEERING LTD.

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TABLES

TABLE 1

ALBERNI VALLEY LANDFILL 2025 MONITORING SCHEDULE

MONITORING LOCATION	Field Parameters		Laboratory								
			Physical Parameters	Anions	Nutrients	Metals	COD	TOC	VOC Scan	Acid Extractables	PFAS
	temp, pH, conductance	water level	pH, conductance, TDS, total hardness	alkalinity, chloride, sulphate	ammonia, nitrate, total phosphorus	ICP ICP/MS; FWAL detection limits					
LEACHATE											
Lagoon Inlet	Q	Q	Q	Q	Q	Q (total)	Q	Q	A (Note 2)	A (Note 2)	A
South Expansion Area French Drain	Q	Q	Q	Q	Q	Q (total)	Q	Q	A	A	
SOUTHEAST WELLS											
MW02-3S (Surficial Sediments)	Q	Q	Q	Q	Q	Q (dis)	Q				
MW02-3D (Bedrock)	Q	Q	Q	Q	Q	Q (dis)	Q				
MW05-1S (Surficial Sediments)	Q	Q	Q	Q	Q						
MW05-1D (Bedrock)	Q	Q	Q	Q	Q						
PW-1 (Bedrock Leachate Well)	Q	Q	Q	Q	Q	Q (dis)	Q				
PW15-1 (Bedrock Leachate Well)		Q									
PW-2 (Surficial Sediment Leachate Well)	Q	Q	Q	Q	Q	Q (dis)	Q				
PW15-2 (Surficial Sediment Leachate Well)		Q									
MW24-1S (Bedrock) (Note 3)	A	Q	A	A	A	A (dis)	A				
MW24-1D (Bedrock) (Note 3)	A	Q	A	A	A	A (dis)	A				
SOUTH AND WEST WELLS											
MW94-4S (Surficial Sediments)	Q	Q	Q	Q	Q	Q (dis)	Q				
MW94-4D (Bedrock)	Q	Q	Q	Q	Q						
MW23-2 (Surficial Sediments)	Q	Q	Q	Q	Q	Q (dis)	Q				
MW02-1D (Background Bedrock)	Q	Q	Q	Q	Q	Q (dis)	Q				
MW02-4 (Background Bedrock)	Q	Q	Q	Q	Q	Q (dis)	Q				
BH00-1A		Q									
BH00-5A-S/D		Q									
BH00-6A		Q									
BH00-7A		Q									
BH00-8A		Q									
MW09-1,2,3,4 and 10		Q									
NORTH WELLS											
MW94-5S (Bedrock)	Q	Q	Q	Q	Q	Q (dis)	Q				
MW94-6S (Surficial Sediments)	Q	Q	Q	Q	Q	Q (dis)	Q				
MW94-6D (Bedrock)	Q	Q	Q	Q	Q	Q (dis)	Q	Q			
MW98-9 (Surficial Sediments)	Q	Q	Q	Q	Q	Q (dis)	Q				
MW98-10 (Surficial Sediments)	Q	Q	Q	Q	Q	Q (dis)	Q				
MW23-1S (Surficial Sediments)	Q	Q	Q	Q	Q	Q (dis)	Q				
MW23-1D (Bedrock)	Q	Q	Q	Q	Q	Q (dis)	Q				
2013 WELLS											
MW13-1S (Bedrock) (Note 4)	Q	Q	Q	Q	Q						
MW13-1D (Bedrock)	A	Q	A	A	A	A (dis)	A				
MW13-2S (Bedrock) (note 4)	Q	Q	Q	Q	Q						
MW13-2D		Q									
CREEK SITES											
Heath Creek	Q	Q	Q	Q	Q	Q (total)	Q				
Stevens Creek	Q	Q	Q	Q	Q	Q (total)	Q				
Christie Creek U/S	Q	Q	Q	Q	Q	Q (total)	Q				
Christie Creek D/S	Q	Q	Q	Q	Q	Q (total)	Q				
Domestic Wells											
DW-A	A		A	A	A	A (dis)					
DW-B	A		A	A	A	A (dis)					
DW-C	A		A	A	A	A (dis)					
DW-D	A		A	A	A	A (dis)					
DW-E	A		A	A	A	A (dis)					
DW-F	A		A	A	A	A (dis)					

Notes:

H:\Project\1005\Analysis\Chemistry\2025\[Summary Tables 2025.xlsx]Table 1

1. Q indicates sample is collected quarterly, A indicates sample is collected annually (in the summer if water is present).
2. If dry conditions preclude sample collection in summer 2025, samples should be collected for VOCs and acid extractable analyses at the next sampling event.
3. MW24-1S and MW24-1D were installed in October 2024. They were not sampled in 2025. Recovery in these wells is slow; annual sampling is recommended as water levels permit.
4. Sampling frequency at MW13-1S can be reduced to annually in 2026. MW13-2S should continue to be sampled quarterly until a relatively stable chemistry is indicated.

TABLE 2

SUMMARY OF LEACHATE EFFECTS BASED ON MEAN 2025 CONCENTRATIONS

MONITORING LOCATION	Table Reference for full chemistry results	Well Recovery[5] I = Immediate SR = Slow Recovery	Number of samples	pH-Field	EC-Lab	Total Dissolved Solids	Chloride	Ammonia Nitrogen[6]	Nitrate	Chemical Oxygen Demand	Total or Dissolved Hardness	Total or Dissolved Iron	Total or Dissolved Manganese
				(pH Units)	(µS/cm)	(mg/L)	(mg/L)	(mg/L-N)	(mg/L-N)	(mg/L-O)	(mg/L)	(mg/L)	(mg/L)
GCDWQ [1]				7-10.5	-	500	250	-	10	-	-	0.1	0.02
BC FWAL GUIDELINE [2]				6.5-9	-	-	150	1.8	3	-	-	0.35	1.3 (leachate)
CSR AW GUIDELINE[7]				-	-	-	1500	18.4	400	-	-	-	-
CSR DW GUIDELINE[7]				-	-	-	250	-	10	-	-	6.5	1.5
LEACHATE													
Lagoon Inlet	B-1 to B-3	-	2	7.0	902	**525**	85	**13.4**	**5.22**	41	232	**1.96**	**2.89**
South Expansion Area French Drain	B-1 to B-4	-	4	7.1	409	263	12	**2.13**	2.28	<14	175	**0.131**	**2.01**
SOUTHEAST WELLS													
MW02-3S (Surficial Sediments)	B-5	I	4	7.2	1095	**676**	67	0.054	<0.029	<27	516	0.076	**0.557**
MW02-3D (Bedrock)	B-6	SR	4	7.1	1150	**703**	67	1.43	<0.028	36	502	<0.048	**1.07**
MW05-1S (Surficial Sediments)	B-16	I	4	7.1	229	193	16	<0.006	**7.74**	-	-	-	-
MW05-1D (Bedrock)	B-16	I	4	**6.5**	897	**569**	44	1.44	<0.032	-	-	-	-
PW-1 (Bedrock Leachate Well)	B-17	I	3	**6.8**	1024	**644**	65	**3.97**	<0.124	42	420	**0.369**	**3.95**
PW15-1 (Bedrock Leachate Well)	B-17	I	1	**6.8**	1350	**841**	**194**	**3.63**	0.035	42	480	<0.100	**3.13**
PW-2 (Surficial Sediment Leachate Well)	B-18	I	4	**6.7**	1756	**871**	135	**60.9**	<0.360	95	427	**6.87**	**4.55**
PW15-2 (Surficial Sediment Leachate Well)	B-18	I	0	PW15-2 not sampled in 2025									
SOUTH AND WEST WELLS													
MW94-4S (Surficial Sediments)	B-7	I	3	8.3	271	190	13	0.064	0.04	<25	3.87	<0.010	0.0007
MW94-4D (Bedrock)	B-8	I	3	8.4	368	284	6.2	<0.009	0.61	-	-	-	-
MW23-2 (Surficial Sediments)	B-27	I	4	7.5	100	80	1.6	-	0.15	-	42.7	-	0.0023
MW02-1D (Background Bedrock)	B-14	SR	4	8.0	323	241	7.5	0.312	<0.027	<12	1.67	<0.023	0.0044
MW02-4 (Background Bedrock)	B-15	SR	4	7.4	568	361	96	<0.008	0.06	<15	148	<0.012	<0.002
NORTH WELLS													
MW94-5S (Bedrock)	B-9	SR	3	7.6	267	192	2.2	<0.02	0.32	<11	133	<0.036	<0.011
MW94-6S (Surficial Sediments)	B-10	I	4	7.6	535	313	8.6	**7.80**	<0.007	45	193	<2.29	**3.80**
MW94-6D (Bedrock)	B-11	SR	4	9.1	531	**612**	7.2	0.09	0.99	91	<1.5	**0.102**	0.002
MW98-9 (Surficial Sediments)	B-12	I	3	7.0	650	433	70	<0.29	<0.153	32	289	<0.012	**0.021**
MW98-10 (Surficial Sediments)	B-13	I	3	**6.7**	67	48	<1.4	<0.89	0.22	<13	21.5	<0.087	**0.113**
MW23-1S (Surficial Sediments)	B-26	SR	4	7.1	512	310	15	0.359	0.61	-	230	-	**2.42**
MW23-1D (Bedrock)	B-25	SR	4	7.2	441	294	5.5	0.048	-	30	171	0.062	**0.502**
2013 WELLS													
MW13-1S (Bedrock)	B-19	SR	4	7.5	1039	**632**	**243**	0.181	<0.025	-	-	-	-
MW13-1D (Bedrock)	B-20	SR	1	7.6	1100	**668**	**185**	0.474	<0.025	<10	221	**1.56**	**1.58**
MW13-2S (Bedrock)	B-19	SR	4	8.1	169	118	4.0	0.032	2.01	-	-	-	-
CREEK SITES													
Heath Creek	B-21	-	4	7.2	82	0	7.5	<0.007	0.115	<13	26.4	**0.146**	0.012
Stevens Creek	B-22	-	2	7.3	92	0	2.7	0.013	0.130	21	40.4	**<0.560**	**0.330**
Christie Creek U/S	B-24	-	2	7.6	57	0	1.7	<0.005	0.130	<14	24.5	0.091	0.008
Christie Creek D/S	B-23	-	1	7.9	55	0	1.2	0.017	0.127	16	26.0	**0.332**	**0.035**
Domestic Wells													
DW-A	B-28	-	1	7.2	2240	**1160**	**638**	-	0.129	-	40.0	-	0.002
DW-B	B-28	-	1	**6.2**	223	173	2.1	-	0.160	-	114	-	0.0002
DW-C	B-28	-	1	**6.3**	138	99	0.77	-	0.397	-	68.0	0.054	**0.240**
DW-D	B-28	-	1	**6.3**	77	66	0.80	-	0.166	-	33.5	0.033	0.009
DW-E	B-28	-	1	**6.4**	165	122	6.3	-	0.198	-	79.3	-	0.001
DW-F	B-28	-	1	**6.5**	128	95	1.5	-	0.151	-	62.4	-	0.002

H:\Project\1005\Analysis\Chemistry\2025\[Summary Tables 2025.xlsx]Table2

NOTES:

1. GCDWQ = Guidelines for Canadian Drinking Water Quality (Health Canada, 2025). Lowest guideline of maximum acceptable concentration or aesthetic objectives shown.
2. Approved and Working Water Quality Guidelines, Science and Information Branch, Environmental Protection Division, BC Ministry of Environment.
   https://www2.gov.bc.ca/gov/content/environment/air-land-water/water/water-quality/water-quality-guidelines/approved-water-quality-guidelines
   https://www2.gov.bc.ca/assets/gov/environment/air-land-water/water/waterquality/water-quality-guidelines/bc_env_working_water_quality_guidelines.pdf
   Guidelines for the Protection of Fresh-Water Aquatic Life ("FWAL"). Lowest guidelines are shown (ie. Long term average if applicable).
3. **Bolding** denotes parameters which exceed water quality criteria.
4. "-" denotes parameter was not analysed, or a receiving water criteria was not applicable.
5. Well recovery flag indicates whether well recovers quickly and can be sampled immediately after purging (I) or well recovers slowly and cannot be sampled immediately after purging (SR).
6. CSR guidelines for indicated parameter changes with pH or hardness. Value shown appropriate for pH < 7 and hardness <50 mg/L-CaCO3.
7. Per Schedule 3.2 of the Contaminated Sites Regulation (CSR), March 2023. CSR AW (aquatic life) and DW (drinking water) shown.
   AW standards assume minimum 1:10 dilution is available. As such, samples collected from background and receiving creeks are compared against CSR AW standards/10.
   https://www.bclaws.gov.bc.ca/civix/document/id/lc/statreg/375_96_08

TABLE 3

SUMMARY OF 2025 EXCEEDANCES OF GCDWQ, BC FWAL GUIDELINES, AND CSR AW/DW STANDARDS

			Physical		Dissolved Cations and Anions		Nutrients			Metals (Total or Dissolved)														
MONITORING LOCATION	Table Reference for full chemistry results	Number of samples	pH	TDS	Chloride	Sodium	Nitrate	Ammonia	Total Phosphorous (1)	Aluminum (4)	Arsenic (2)	Boron	Cadmium	Chromium	Cobalt	Copper (3)	Iron	Lithium	Manganese	Mercury	Nickel (3)	Tungsten	Zinc (4)
LEACHATE																							
Lagoon Inlet	B-1 to B-3	2						AW							DW				DW				
South Expansion Area French Drain	B-1 to B-4								P						DW				DW				
SOUTHEAST WELLS																							
MW02-3S (Surficial Sediments)	B-5	4													DW								
MW02-3D (Bedrock)	B-6	4													DW			DW	DW				
MW05-1S (Surficial Sediments)	B-16	4																					
MW05-1D (Bedrock)	B-16	4																					
PW-1/PW15-1 (Bedrock Leachate Well)	B-17	4													DW	AW		DW	DW		AW/DW		AW/DW
PW-2/PW15-2 (Surficial Sediment Leachate Well)	B-18	4			DW	DW		AW							DW	AW	DW		DW		DW		AW/DW
SOUTH AND WEST WELLS																							
MW94-4S (Surficial Sediments)	B-7	3																DW					
MW94-4D (Bedrock)	B-8	3																					
MW23-2 (Surficial Sediments)	B-27	4																					
MW02-1D (Background Bedrock)	B-14	4																DW					
MW02-4 (Background Bedrock)	B-15	4																DW					
NORTH WELLS																							
MW94-5S (Bedrock)	B-9	3																					
MW94-6S (Surficial Sediments)	B-10	4													DW			DW	DW				
MW94-6D (Bedrock)	B-11	4																DW					
MW98-9 (Surficial Sediments)	B-12	3																					
MW98-10 (Surficial Sediments)	B-13	3													DW								
MW23-1S (Surficial Sediments)	B-26	4													DW				DW				
MW23-1D (Bedrock)	B-25	4																DW					
2013 WELLS																							
MW13-1S (Bedrock)	B-19	4																					
MW13-1D (Bedrock)	B-20	1																DW	DW				
MW13-2S (Bedrock)	B-19	4																					
CREEK SITES (5)																							
Heath Creek	B-21	4							P														AW/10
Stevens Creek	B-22	2												AW/10		AW/10							
Christie Creek U/S	B-24	2																					AW/10
Christie Creek D/S	B-23	1																					AW/10
DOMESTIC WELL (Compared against GCDWQ and CSR DW only)																							
DW-A	B-28	1			DW	DW					DW	DW						DW					
DW-B	B-28	1																					
DW-C	B-28	1																					
DW-D	B-28	1																					
DW-E	B-28	1																					
DW-F	B-28	1																					

H:\Project\1005\Analysis\Chemistry\2025\[Summary Tables 2025.xlsx]Table3

NOTES:

1. Phosphorus guideline for creeks from Phosphorus Management in Vancouver Island Streams.
2. FWAL criterion for arsenic not considered relevant for groundwater.
3. Exceedences based on site-specfic calculated dissolved copper or copper guideline dependent on sample pH, temperature, DOC, Humic Acid, Alkalinity and major cation chemistry.
4. Exceedences based on site-specfic calculated guideline dependent on sample pH, DOC, and Hardness.
5. CSR AW standards assume 10 times dilution before entering surface water, therefore analytic water quality data for natural surface watercourses have been compared to one tenth of the AW standard, referred to as “AW/10".

Blue shaded cells show sampling location has at least one exceedance of the BC FWAL or Phosphorus guideline for the parameter indicatec

Red shaded cells show sampling location has at least one exceedance of the GCDWQ for the parameter indicated

Purple shaded cells show sampling location has at least one exceedance of the BC FWAL and GCDWQ for the parameter indicated

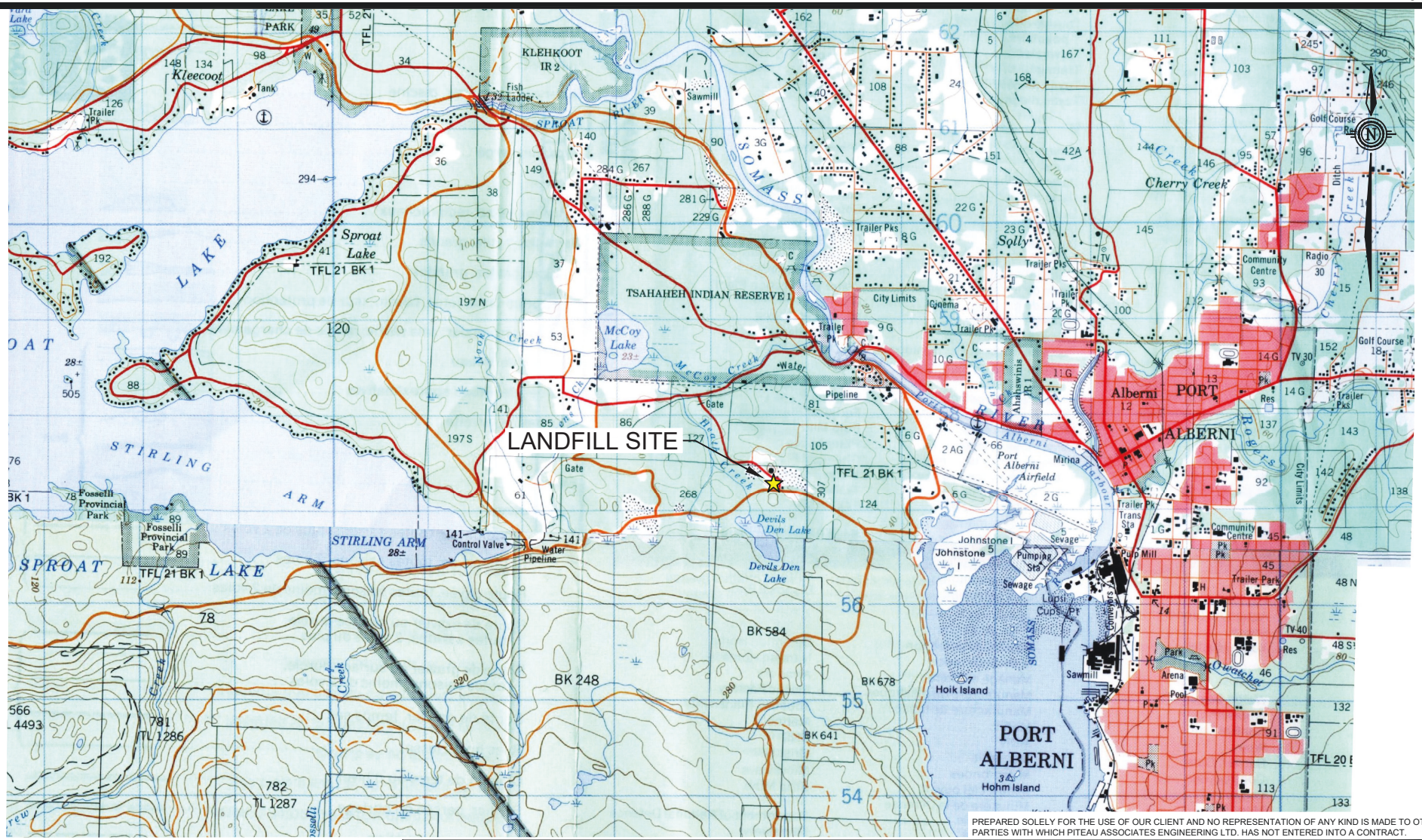
DW Cells with P, DW or AW indicate one or more exceedance of the Phosphorus Objective, CSR DW or AW

No shading or text indicates all sampling results were below all guidelines

Grey shaded cells show sampling location was not analyzed for the parameter indicated

FIGURES

DWG. NUMBER: K:\1005\Cadd\1005-118.dwg (Fig 1)



PREPARED SOLELY FOR THE USE OF OUR CLIENT AND NO REPRESENTATION OF ANY KIND IS MADE TO OTHER PARTIES WITH WHICH PITEAU ASSOCIATES ENGINEERING LTD. HAS NOT ENTERED INTO A CONTRACT.

ALBERNI-CLAYOQUOT REGIONAL DISTRICT
WATER QUALITY MONITORING PROGRAM
ALBERNI VALLEY LANDFILL, PORT ALBERNI, BC

PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS
A TETRA TECH COMPANY

0 1000 2000 3000m

SCALE 1:60,000

LANDFILL LOCATION MAP

BY:	DATE:
RM/sl	MAR 26
APPROVED:	FIGURE:
JM	1

ORIGINAL LANDFILL AREA (6.7Ha)
NORTHEAST EXPANSION AREA
EAST EXPANSION AREA
SOUTH EXPANSION AREA
FLOW EQUALIZATION POND
AERATION LAGOON
FOREMAIN PUMP STATION
INTERCEPTION TRENCH
NORTH LEACHATE INTERCEPTION/CONVEYANCE CHANNEL
FORMER LEACHATE PIPE TO NORTH LEACHATE INTERCEPTION/CONVEYANCE CHANNEL DECOMMISSIONED 2015
BURIED LEACHATE PIPELINE
APPROXIMATE LOCATION OF TEMPORARY LEACHATE CONTAINMENT BERM
SEEPAGE CUTOFF BERM
FRENCH DRAIN
CLAY BERM
BY-PASS ROAD / SMUMS ARM LOGGING ROAD
LOT 'D'
Stevens Cr.
Heath Cr.
HEATH CREEK TRIBUTARY
Norris Cr.
Christie Cr.
DEVIL'S DEN LAKE
DOMESTIC WELLS
* APPROXIMATE LOCATION OF COMMUNITY DOMESTIC WELLS SHOWN, LOCATED NORTHEAST OF THE LANDFILL
LEGEND
GROUNDWATER MONITORING WELL (PREFIX INDICATES DATE OF INSTALLATION)
FORMER GROUNDWATER MONITORING SITE
INTERCEPTION WELL (CONSTRUCTED WINTER 2005/2015)
DUG DOMESTIC WELL
DRILLED DOMESTIC WELL
SURFACE WATER SAMPLING SITE
FORMER SURFACE WATER SAMPLING SITE
SURFACE FLOW CHANNEL
BURIED PIPE
BEDROCK OUTCROPPING OR CLOSE TO SURFACE
APPROXIMATE EXTENT OF LANDFILL EXPANSION AREAS
HYDROGEOLOGICAL SECTION (FIGS. 4 AND 5)
POSTED CONDUCTANCE, CHLORIDE AND NITRATE DATA. ALL DATA ARE MAXIMUM VALUES MEASURED IN 2025, UNLESS OTHERWISE STATED.
CONDUCTANCE (µS/cm)
CHLORIDE (mg/L)
NITRATE (mg/L-N)
* AMMONIA CONCENTRATION SHOWN WHERE IT EXCEEDS NITRATE CONCENTRATION
INDICATES SURFACE WATER SAMPLE
INDICATES SURFICIAL SEDIMENTS GROUNDWATER SAMPLE
INDICATES BEDROCK GROUNDWATER SAMPLE
TOPOGRAPHY PROVIDED BY SPERLING HANSEN
LANDFILL PROPERTY BOUNDARY
SCALE 1:2000

NOTES:

1. NOT SAMPLED SINCE 2005, RESULTS FROM 2005 SHOWN.
2. NOT SAMPLED SINCE 2008, RESULTS FROM 2008 SHOWN.
3. NOT SAMPLED SINCE 2010, RESULTS FROM 2010 SHOWN.
4. NOT SAMPLED SINCE 2011, RESULTS FROM 2011 SHOWN.
5. NOT SAMPLED SINCE 2013, RESULTS FROM 2013 SHOWN.
6. NOT SAMPLED SINCE 2016, RESULTS FROM 2016 SHOWN.
7. LANDFILL TOPOGRAPHY (AVL 20201223 for DXF.DXF) AT 1m CONTOUR INTERVAL SURVEYED ON DECEMBER 23, 2020 AND PROVIDED BY SPERLING HANSEN ON JANUARY 20 2021.

ALBERNI-CLAYOQUOT REGIONAL DISTRICT
WATER QUALITY MONITORING PROGRAM
ALBERNI VALLEY LANDFILL, PORT ALBERNI, BC

PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS
A TETRA TECH COMPANY

SITE PLAN

BY:	DATE:
RM/sl	MAR 26
APPROVED:	FIG:
JM	2


HEATH CREEK AT
McCOY LAKE ROAD
Stevens Cr.
Norris Cr.
DOMESTIC WELLS
* APPROXIMATE LOCATION OF COMMUNITY DOMESTIC WELLS SHOWN, LOCATED NORTHEAST OF THE LANDFILL
FORCEMAIN PUMP STATION
INTERCEPTION TRENCH
NORTH LEACHATE INTERCEPTION/CONVEYANCE CHANNEL
CLAY BERM
HEATH CREEK TRIBUTARY
NORTHEAST EXPANSION AREA
ORIGINAL LANDFILL AREA (6.7Ha)
EAST EXPANSION AREA
BURIED LEACHATE PIPELINE
AERATION LAGOON
FLOW EQUALIZATION POND
SOUTH EXPANSION AREA
FRENCH DRAIN
SEEPAGE CUTOFF BERM
APPROXIMATE LOCATION OF TEMPORARY LEACHATE CONTAINMENT BERM
EXPANSION AREA DRAIN
BY-PASS ROAD / STAMP ARM LOGGING ROAD
Heath Cr.
Christie Cr.
DEVIL'S DEN LAKE
MW02-4 65.91
MW23-1D MW23-1S 69.79 68.50
MW94-5S 75.93
MW94-5D
MW98-9 74.56
MW98-10 74.33
MW94-6 71.68 58.51
MW13-2D 78.26
MW13-2S 77.50
MW13-1S 71.40
MW13-1D 56.13 (NOT STATIC)
MW94-1 67.31
MW24-1
MW94-4 >72.56 55.73
MW09-1 72.17
MW09-2 73.16
MW09-3 73.15
MW09-4 73.58
MW09-5
MW94-7
BH00-3A
BH00-2C
BH00-1C
BH00-1A 69.43
BH00-5B
MW94-3
PW-1 50.31
PW-2 66.82
PW15-2 67.60
PW15-1 51.03
MW15-1S MW15-1D 68.53 68.42
MW05-1S MW05-1D 67.65 57.04
MW02-3D MW02-3S 69.31 67.83
BH00-5A 69.70 69.70
BH00-6A 67.70
BH00-7A 66.50
BH00-8A 72.17
MW05-6 73.4 *(JAN 2012)
MW09-9 73.63 *(JUL 2018)
MW09-8 72.03 *(NOV 2014)
MW09-10 <70.37
MW09-7
MW94-8
BH00-2A
MW09-12
MW09-11 <74.2 *(JAN 2016)
MW09-13 68.68 *(OCT 2017)
BH00-4A
MW23-2 MW02-1D 69.64 70.90
MW02-2 68.27 *(JUL 2011)
MW94-2
BH00-11A
MH
MH (INV. 70.2)
MH (INV. 70.83±)
MH (INV. 70.56±)
LOT "D"
L 397
X X'
Y Y'
N N'
5457800 N
5457600 N
5457400 N
5457200 N
364200 E
364400 E
364600 E
364800 E
365000 E
365200 E
365400 E
365600 E
LEGEND
MW02-3 GROUNDWATER MONITORING WELL (PREFIX INDICATES DATE OF INSTALLATION)
BH00-11A MONITORING WELL, NO LONGER MONITORED
PW-1 INTERCEPTION WELL (CONSTRUCTED WINTER 2005/2015)
69.05 69.05 GROUNDWATER ELEVATIONS MEASURED IN OCTOBER 2025 BLUE DENOTES PIEZOMETRIC LEVEL IN SURFICIAL SEDIMENTS AND RED DENOTES PIEZOMETRIC LEVEL IN BEDROCK
APPROXIMATE EXTENT OF LANDFILL EXPANSION AREAS
ORIGINAL LANDFILL AREA
BEDROCK OUTCROPPING OR CLOSE TO SURFACE
INTERPRETED GROUNDWATER FLOW DIVIDE IN SURFICIAL SEDIMENTS (DASHED LINE INDICATES VERY APPROXIMATE)
INTERPRETED GROUNDWATER FLOW DIRECTION IN SURFICIAL SEDIMENTS
INTERPRETED GROUNDWATER FLOW DIVIDE IN BEDROCK (DASHED LINE INDICATES VERY APPROXIMATE)
INTERPRETED GROUNDWATER FLOW DIRECTION IN BEDROCK
70 INTERPRETED ALLUVIAL GROUNDWATER ELEVATION CONTOUR
75 INTERPRETED BEDROCK SURFACE CONTOUR FROM DRILLING AND SEISMIC SURVEY DATA (m-geod.)
55 TOPOGRAPHY PROVIDED BY SPERLING HANSEN
HYDROGEOLOGICAL SECTIONS (FIGS. 4 AND 5)

NOTE:

1. LANDFILL TOPOGRAPHY (AVL 20201223 for DXF.DXF) AT 1m CONTOUR INTERVAL SURVEYED ON DECEMBER 23, 2020 AND PROVIDED BY SPERLING HANSEN ON JANUARY 20 2021.

0 20 40 60 80 100m
SCALE 1:2000

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ALBERNI VALLEY LANDFILL, PORT ALBERNI, BC

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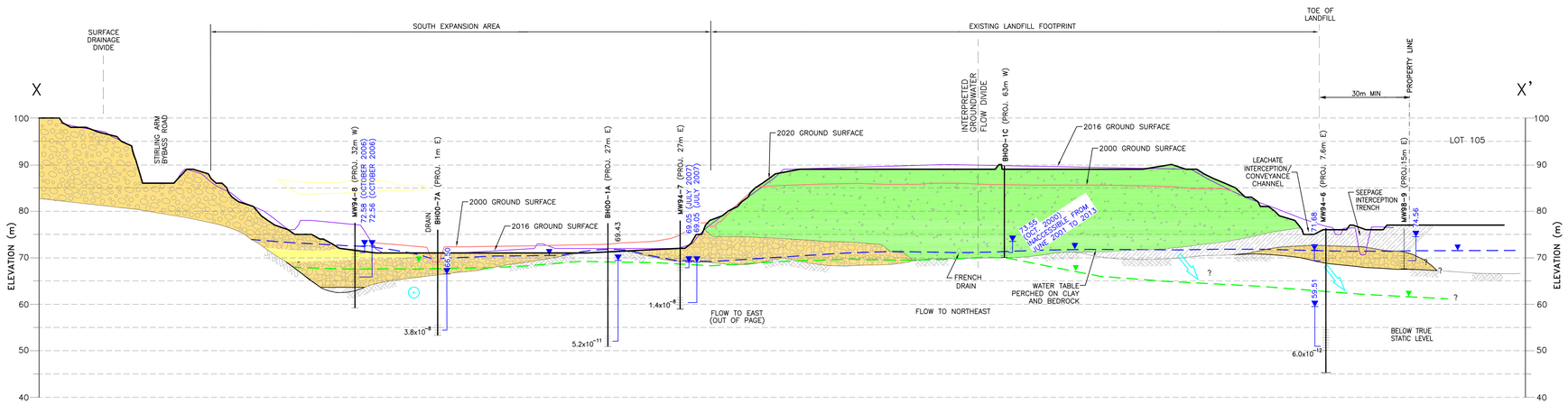
A TETRA TECH COMPANY

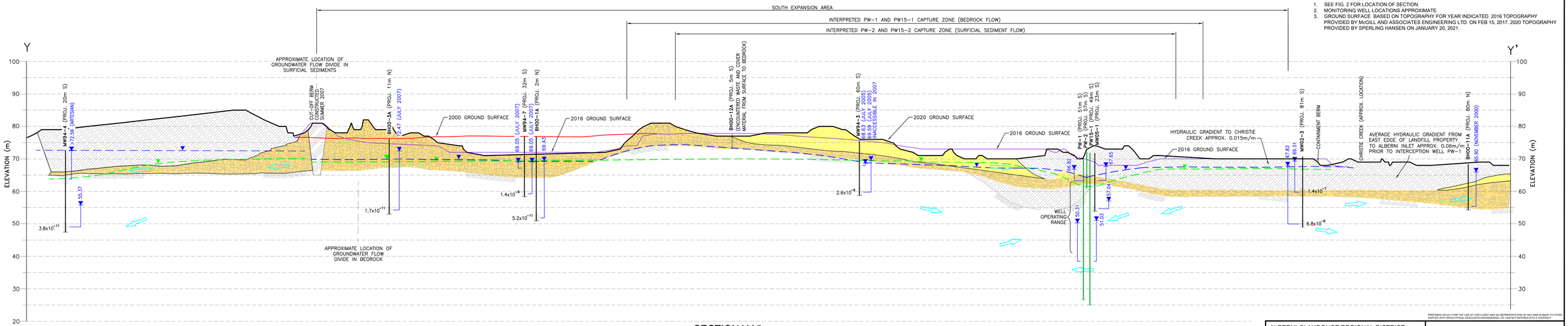
POSTED GROUNDWATER ELEVATIONS AND INTERPRETED GROUNDWATER FLOW DIRECTIONS

BY:	DATE:
RM/sl	MAR 26
APPROVED: JM	FIG: 3

DWG NUMBER: K:\105\Cad\105-137.dwg [Fig 4]



SECTION X-X'



SECTION Y-Y'

LEGEND

- MUNICIPAL WASTE
- SILT AND CLAY SEDIMENTS (ML)
- SAND AND GRAVEL (GW)
- FINE SAND AND SILTY SAND (SP)
- VERY DENSE SAND AND SILT TILL - SOME GRAVEL (SM)
- BEDROCK SURFACE
- BH / MW — MONITORING WELLS SHOWING PIEZOMETER COMPLETION ZONES AND WATER LEVELS MEASURED DECEMBER 2025, UNLESS OTHERWISE NOTED. (SEE LOGS IN PITEAU, 2000, AND PITEAU 2017a) NUMBERS POSTED BESIDE SCREENS ARE HYDRAULIC CONDUCTIVITY VALUES (m/s) DETERMINED FROM RISING HEAD TEST. (1.4x10-7 / 6.8x10-8)
- PW-1 — LEACHATE INTERCEPTION WELL
- INTERPRETED WATER TABLE IN SURFICIAL SEDIMENTS
- INTERPRETED 2025 PIEZOMETRIC LEVEL IN BEDROCK
- INTERPRETED GROUNDWATER FLOW DIRECTION (IF IN PLANE OF SECTION)
- INTERPRETED GROUNDWATER FLOW DIRECTION IS OUT OF PAGE

NOTES:

1. SEE FIG. 2 FOR LOCATION OF SECTION.
2. MONITORING WELL LOCATIONS APPROXIMATE.
3. GROUND SURFACE BASED ON TOPOGRAPHY FOR YEAR INDICATED. 2016 TOPOGRAPHY PROVIDED BY McGILL AND ASSOCIATES ENGINEERING LTD. ON FEB 15, 2017. 2020 TOPOGRAPHY PROVIDED BY SPERLING HANSEN ON JANUARY 20, 2021.

SCALE 1:1000
VERTICAL EXAGGERATION = 2X

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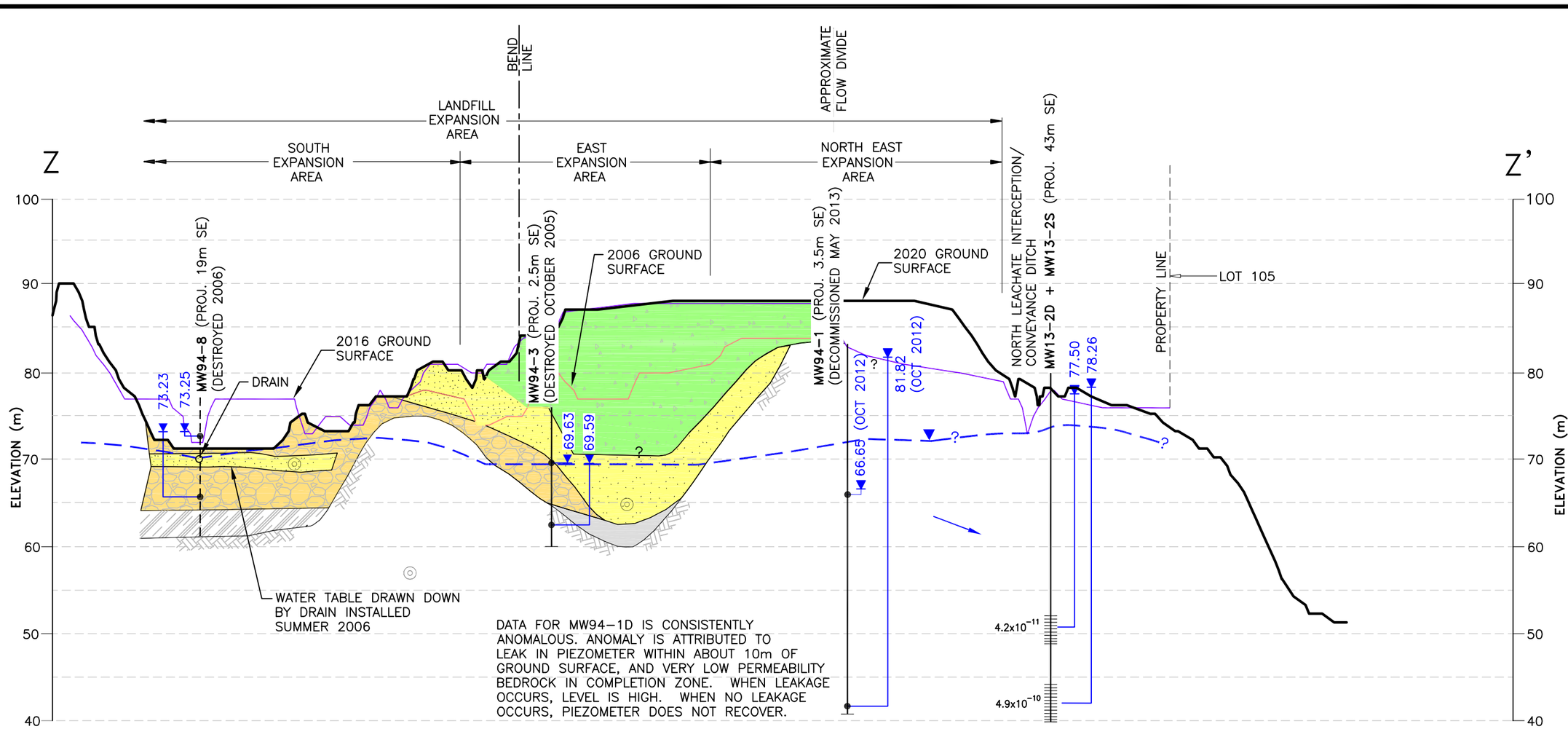
HYDROGEOLOGICAL SECTIONS X-X' AND Y-Y' THROUGH ORIGINAL LANDFILL AND SOUTH EXPANSION AREA

BY:	DATE:
RB/sl	MAR 26
APPROVED:	FIG.
JM	4

DWG. NUMBER: K:\1005\Cadd\1005-122.dwg (Fig 5)



SECTION Z-Z'

NOTES:

1. SEE FIG. 2 FOR LOCATION OF SECTION.
2. MONITORING WELL LOCATIONS APPROXIMATE.
3. BOTH MONITORING WELL MW94-3 AND MW94-8 WERE DESTROYED. LAST AVAILABLE READINGS SHOWN ON SECTION. INTERPRETED WATER TABLE ELEVATION BASED ON DATA FROM OTHER MONITORING WELLS IN AREA.
4. MW94-1 WAS DECOMMISSIONED IN MAY 2013 AND WAS REPLACED WITH MW13-2.
5. GROUND SURFACE BASED ON TOPOGRAPHY FOR YEAR INDICATED. 2016 TOPOGRAPHY PROVIDED BY McGILL AND ASSOCIATES ENGINEERING LTD. ON FEB 15, 2017. 2020 TOPOGRAPHY PROVIDED BY SPERLING HANSEN ON JANUARY 20, 2021.

LEGEND

- MUNICIPAL WASTE AND COVER MATERIAL
- VERY DENSE SAND AND SILT WITH TRACE CLAY AND SOME GRAVEL-TILL
- SILT AND CLAY SEDIMENTS (ML)
- SAND AND GRAVEL (GW)
- FINE SAND AND SILTY SAND (SP)
- BEDROCK SURFACE

4.2x10-11 / 4.9x10-10 — MONITORING WELLS SHOWING PIEZOMETER COMPLETION ZONES AND WATER LEVELS MEASURED DECEMBER 2025, UNLESS OTHERWISE NOTED. (SEE LOGS IN PITEAU, 2000, AND PITEAU 2017a) NUMBERS POSTED BESIDE SCREENS ARE HYDRAULIC CONDUCTIVITY VALUES (m/s) DETERMINED FROM RISING HEAD TEST.

- INTERPRETED WATER TABLE
- INTERPRETED GROUNDWATER FLOW DIRECTION
- FLOW OUT OF PAGE

0 20 40 60 80 100m

SCALE 1:2500

VERTICAL EXAGGERATION = 5X

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HYDROGEOLOGICAL SECTION Z-Z'
THROUGH ORIGINAL LANDFILL AND SOUTH EXPANSION AREA

BY:	DATE:
RM/sl	MAR 26
APPROVED:	FIG:
JM	5

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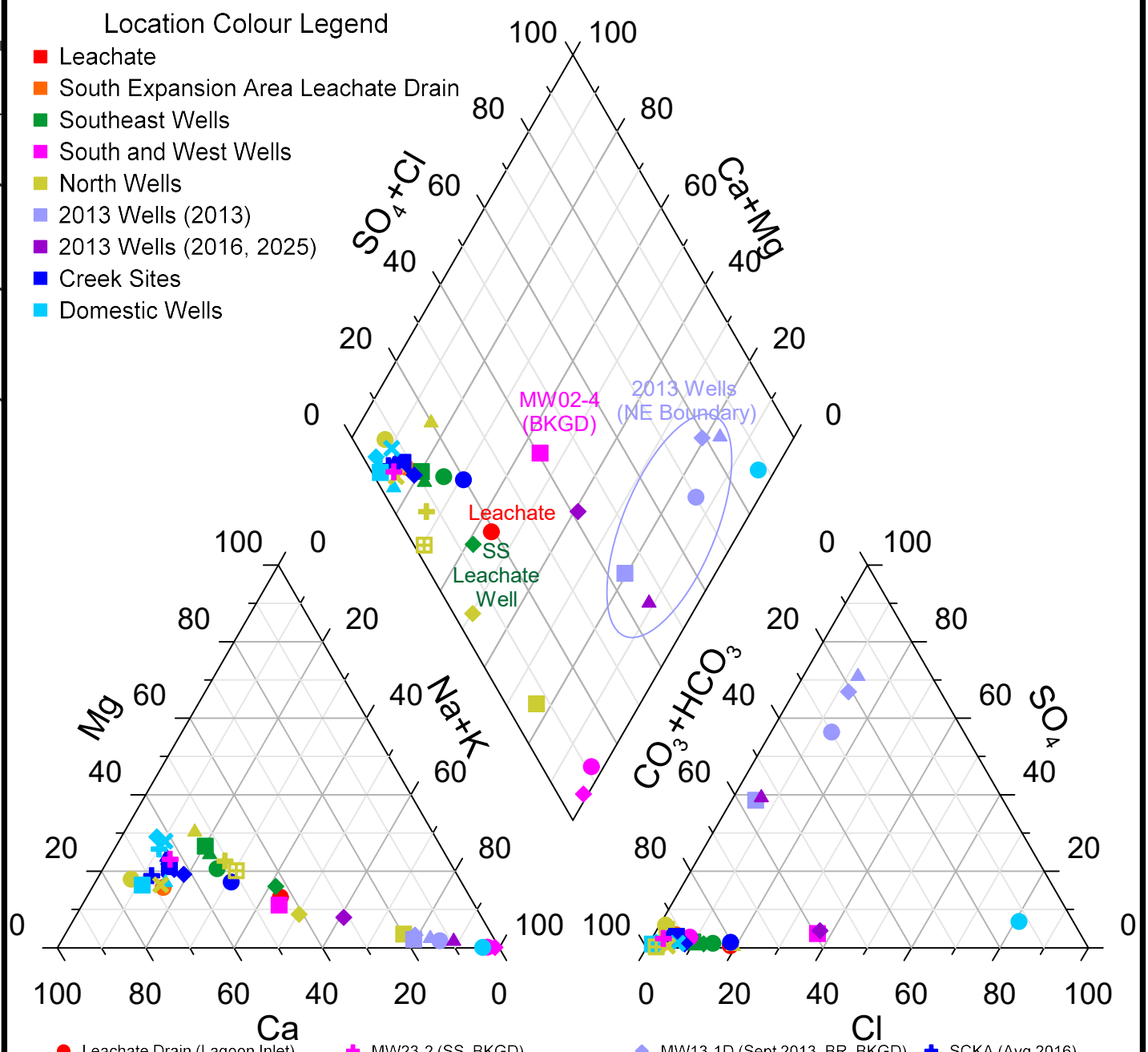

- Leachate Drain (Lagoon Inlet)
- South Expansion Leachate Drain
- PW-1/PW15-1 (BR Leachate Well)
- PW-2/PW15-2 (SS Leachate Well)
- MW02-3S (SS)
- MW02-3D (BR)
- MW94-4S (SS)
- MW02-1D (BR, BKGD)
- MW02-4 (BR, BKGD)
- MW23-2 (SS, BKGD)
- MW94-5S (BR)
- MW94-6S (SS)
- MW94-6D (BR)
- MW98-9 (SS)
- MW98-10 (SS)
- MW23-1S (SS)
- MW23-1D (BR)
- MW13-1S (Sept 2013, BR, BKGD)
- MW13-1D (Sept 2013, BR, BKGD)
- MW13-2S (Sept 2013, BR, BKGD)
- MW13-2D (Sept 2013, BR, BKGD)
- MW13-1D (Avg 2025)
- MW13-2D (Avg 2016)
- Heath Creek (BKGD)
- Stevens Creek
- Christie Creek U/S (BKGD)
- Christie Creek D/S
- SCKA (Avg 2016)
- SCKB (Avg 2016)
- DW-A (BR)
- DW-B (SS)
- DW-C (SS)
- DW-D (SS)
- DW-E (SS)
- DW-F (SS)

Notes:
1. All values are averages of 2025 sampling except where noted in legend
2. Samples collected at leachate pumping wells alternated between PW-1/PW15-1 (BR) and PW-2/PW15-2 (SS)
3. All values are dissolved minerals except surface water sampling sites are total minerals
4. MW05-1S, MW05-1D and MW94-4D are not included due to no cation testing
5. BKGD: Background, SS: Surficial Sediment, BR: Bedrock

ALBERNI-CLAYOQUOT REGIONAL DISTRICT
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PIPER PLOTS FOR SURFACE AND GROUNDWATER SAMPLES

BY:	DATE:
RM	MAR 26
APPROVED:	FIG:
JM	6

APPENDIX A
WATER ELEVATION MONITORING DATA TABLES AND PLOTS

APPENDIX A - LIST OF TABLES

TABLE A-1

2025 MONITORING WELL ELEVATION DATA

Sample	Ground Elevation (m-geod)[1]	Top of Casing (m-geod)	Piezo Bottom (m-geod)	Completion Zone	Q1 Sampling Event		Q2 Sampling Event		Q3 Sampling Event		Q4 Sampling Event	
					Measured Water Elevation (m-geod)	Date	Measured Water Elevation (m-geod)	Date	Measured Water Elevation (m-geod)	Date	Measured Water Elevation (m-geod)	Date
MW94-4S	71.79	72.56	62.0	bdrk/surf	>72.56	18-Mar-25	>72.56	18-Jun-25	55.73	17-Sep-25	no access	-
MW94-4D	71.79	72.67	47.2	bedrock	70.53	18-Mar-25	>72.665	18-Jun-25	>72.56	17-Sep-25	no access	-
MW94-5S	76.66	77.26	66.9	bedrock	75.86	17-Mar-25	72.44	17-Jun-25	70.73	17-Sep-25	75.93	1-Dec-25
MW94-6S	75.60	76.16	67.4	surficial	72.05	17-Mar-25	70.71	16-Jun-25	73.26	17-Sep-25	71.68	1-Dec-25
MW94-6D	75.60	76.16	49.1	bedrock	*61.22*	17-Mar-25	*58.49*	18-Jun-25	59.30	17-Sep-25	59.51	1-Dec-25
MW98-9[3]	75.50	76.14	67.6	surficial	72.59	17-Mar-25	<67.605	16-Jun-25	73.16	17-Sep-25	74.56	1-Dec-25
MW98-10[3]	75.37	76.08	72.4	surficial	74.37	17-Mar-25	<72.363	16-Jun-25	72.99	17-Sep-25	74.33	1-Dec-25
MW23-1S	69.90	71.13	66.8	surficial	70.03	17-Mar-25	70.32	18-Jun-25	not recorded	-	69.79	1-Dec-25
MW23-1D	69.98	71.00	61.1	bedrock	69.00	17-Mar-25	66.75	16-Jun-25	65.95	22-Sep-25	68.50	1-Dec-25
BH00-1A	71.76	72.43	46.8	bedrock	70.68	14-Mar-25	69.58	16-Jun-25	not recorded	-	69.43	3-Dec-25
BH00-5A-S	75.72	76.72	69.0	bdrk-frac	69.87	14-Mar-25	69.40	16-Jun-25	69.38	15-Sep-25	69.70	3-Dec-25
BH00-5A-D	75.72	76.72	62.9	bedrock	70.91	14-Mar-25	69.90	16-Jun-25	69.76	15-Sep-25	69.70	3-Dec-25
BH00-6A	74.84	75.80	60.5	bedrock	70.05	14-Mar-25	68.09	16-Jun-25	67.29	15-Sep-25	67.70	3-Dec-25
BH00-7A	71.03	71.75	48.7	bedrock	<53.5	14-Mar-25	<53.65	16-Jun-25	71.75	15-Sep-25	66.50	3-Dec-25
BH00-8A	71.66	72.39	55.2	bedrock	71.49	14-Mar-25	71.39	16-Jun-25	71.15	15-Sep-25	72.17	3-Dec-25
MW23-2	69.98	78.27	65.0	surficial	70.27	18-Mar-25	68.91	17-Jun-25	68.53	17-Sep-25	69.64	2-Dec-25
MW02-1D	77.36	78.45	19.2	bedrock	72.75	17-Mar-25	70.27	17-Jun-25	69.03	17-Sep-25	70.90	2-Dec-25
MW02-3S[3]	70.66	70.66	59.1	surficial	68.81	18-Mar-25	67.21	18-Jun-25	66.66	16-Sep-25	69.31	2-Dec-25
MW02-3D[3]	70.72	70.72	48.8	bedrock	68.05	18-Mar-25	66.42	18-Jun-25	63.77	16-Sep-25	67.83	2-Dec-25
MW02-4	67.22	68.15	19.1	bedrock	66.02	17-Mar-25	63.93	17-Jun-25	63.05	16-Sep-25	65.91	2-Dec-25
MW05-1S[3]	70.80	71.50	59.2	surficial	70.17	17-Mar-25	65.46	17-Jun-25	64.91	16-Sep-25	67.65	2-Dec-25
MW05-1D[3]	70.80	71.50	38.8	bdrk-frac	59.06	17-Mar-25	56.10	17-Jun-25	58.28	16-Sep-25	57.04	2-Dec-25
PW-1[3]	71.57	72.01	26.8	bdrk-frac	51.06	14-Mar-25	48.44	16-Jun-25	54.62	15-Sep-25	50.31	3-Dec-25
PW-2[3]	71.59	72.04	60.3	surficial	68.93	14-Mar-25	64.82	16-Jun-25	62.78	15-Sep-25	66.82	3-Dec-25
PW15-1[3]	70.96	71.53	25.2	bedrock	50.89	14-Mar-25	50.69	16-Jun-25	64.25	15-Sep-25	51.03	3-Dec-25
PW15-2[3]	71.43	71.80	59.8	surficial	63.38	14-Mar-25	71.16	16-Jun-25	41.44	15-Sep-25	67.60	3-Dec-25
MW13-1S	73.11	74.10	48.0	bedrock	71.14	18-Mar-25	70.37	18-Jun-25	70.69	16-Sep-25	71.40	2-Dec-25
MW13-1D	73.00	73.96	37.8	bedrock	68.04	14-Mar-25	69.61	16-Jun-25	69.78	16-Sep-25	56.13	2-Dec-25
MW13-2S	78.50	79.04	48.3	bedrock	78.30	18-Mar-25	76.93	18-Jun-25	58.74	17-Sep-25	77.50	2-Dec-25
MW13-2D	78.97	79.87	38.8	bedrock	79.26	14-Mar-25	77.75	16-Jun-25	76.89	15-Sep-25	*78.26*	3-Dec-25
MW15-1S	70.83	71.86	64.1	surficial	68.56	14-Mar-25	67.05	16-Jun-25	66.66	15-Sep-25	68.42	3-Dec-25
MW15-1D	70.83	71.86	46.3	bedrock	68.48	14-Mar-25	67.20	16-Jun-25	66.36	15-Sep-25	72.17	3-Dec-25
MW09-01	73.38	74.29	71.4	sediment	72.51	14-Mar-25	71.65	16-Jun-25	74.29	15-Sep-25	72.17	3-Dec-25
MW09-02	73.99	74.91	70.3	sediment	74.31	14-Mar-25	72.02	16-Jun-25	70.71	15-Sep-25	73.16	3-Dec-25
MW09-03	74.61	75.48	60.9	sediment	73.45	14-Mar-25	71.66	16-Jun-25	70.89	15-Sep-25	73.15	3-Dec-25
MW09-04	75.52	76.24	70.3	sediment	73.98	14-Mar-25	72.29	16-Jun-25	71.24	15-Sep-25	73.58	3-Dec-25
MW09-10	71.80	72.86	69.4	sediment	<69.4	14-Mar-25	<69.4	16-Jun-25	<69.4	3-Dec-25	<69.4	3-Dec-25

H:\Project\1005\Analysis\Water_Elevations\2025\[Tables-2025.xlsx]Table A-1

NOTES:

1. Monitoring wells were surveyed by McGill & Associates Engineering Ltd. prior to 2020, and in 2023.
2. Italicized values indicate non-static water elevations in slow responding monitoring wells.
3. Water levels are also recorded with the SCADA system at this location.

APPENDIX A - LIST OF FIGURES

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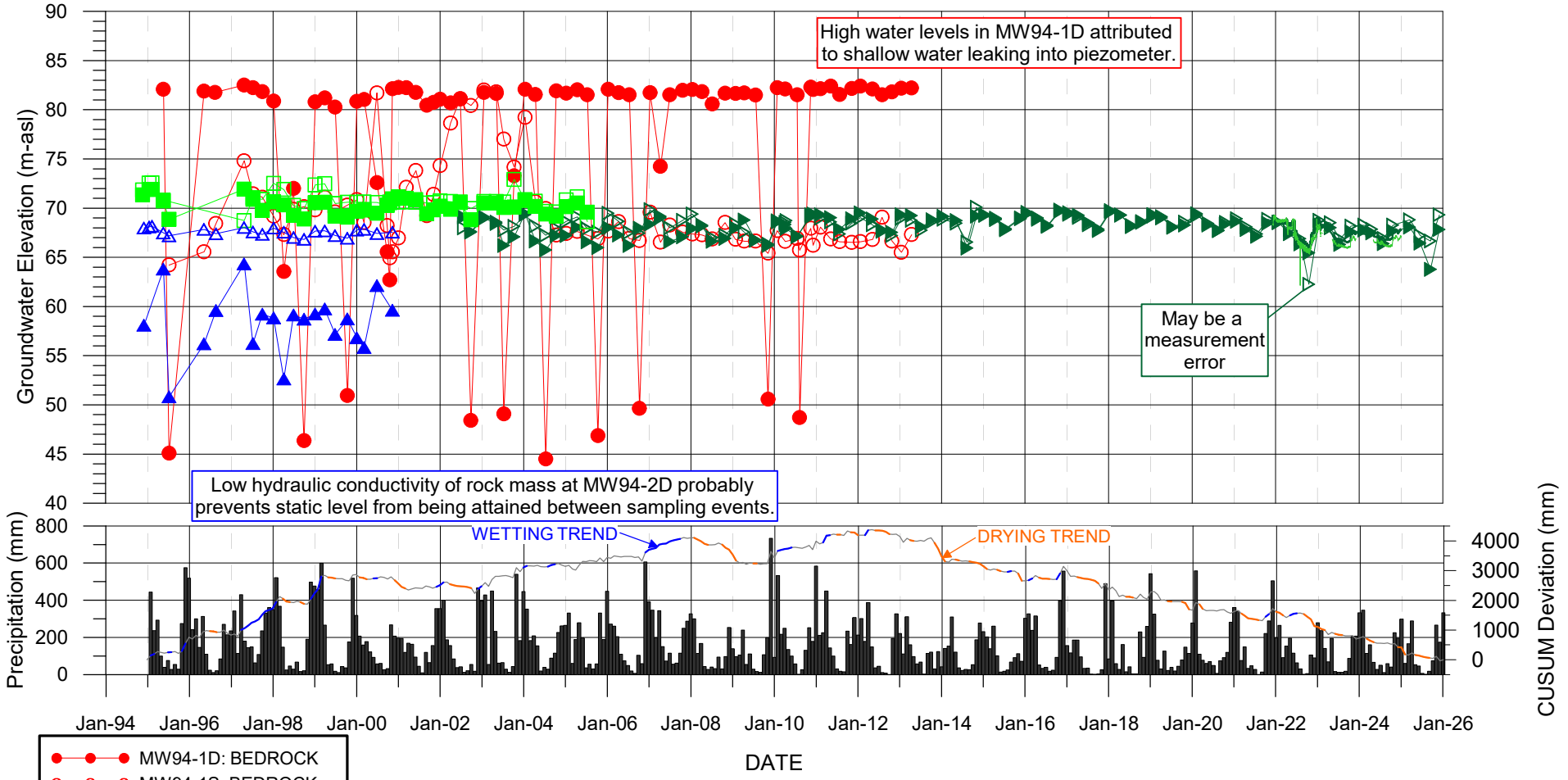

Note:
1. Precipitation measured at Environment Canada's Robertson Creek (1995-2018) and Port Alberni (AUT) (2018-present) stations.

ALBERNI-CLAYOQUOT REGIONAL DISTRICT
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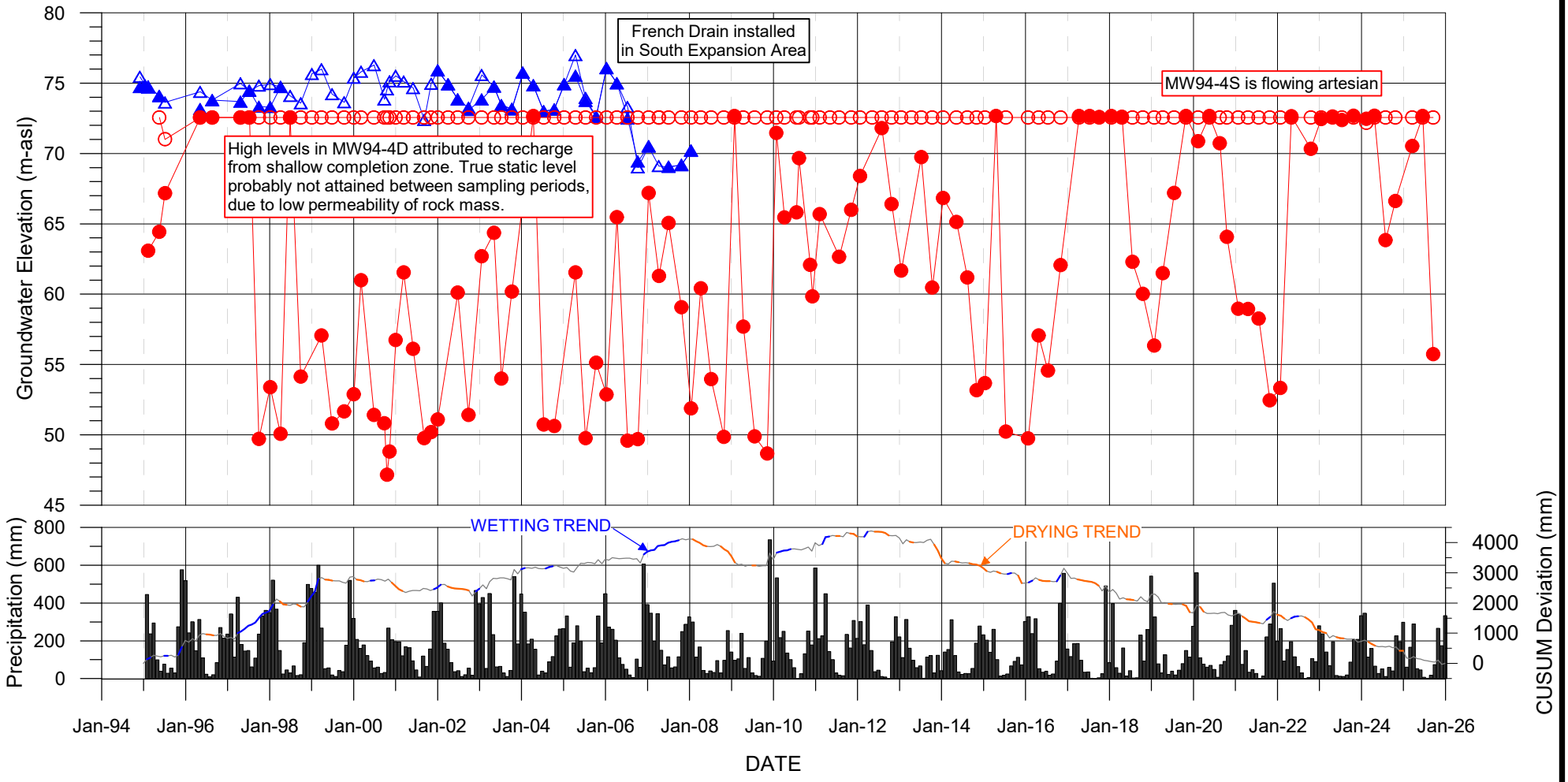
ALBERNI VALLEY LANDFILL, PORT ALBERNI, BC

PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS
A TETRA TECH COMPANY

GROUNDWATER ELEVATIONS FOR EASTERN MONITORING WELLS MW94-1, MW94-2, MW94-3 AND MW02-3

BY:	DATE:
SC	MAR 26
APPROVED:	FIG:
JM	A-1

H:\Project\1005\Analysis\Water_Elevations\20252-WL4-7D.grf



MW94-7D
MW94-7S
MW94-4S
MW94-4D

Note:
1. Precipitation measured at Environment Canada's Robertson Creek (1995-2018) and Port Alberni (AUT) (2018-present) stations.

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ALBERNI VALLEY LANDFILL, PORT ALBERNI, BC

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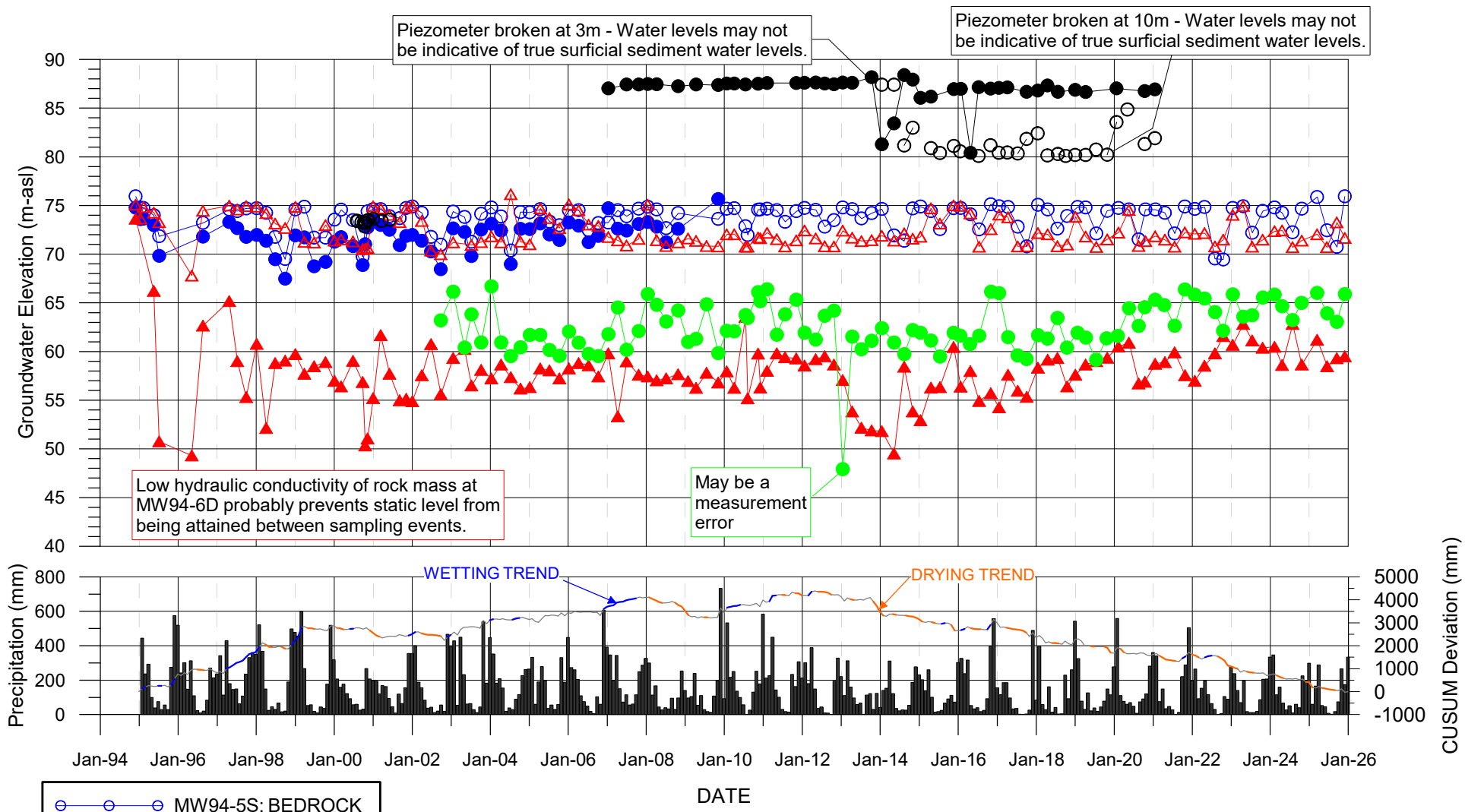
A TETRA TECH COMPANY

GROUNDWATER ELEVATIONS FOR SOUTHERN MONITORING WELLS MW94-4 AND MW94-7

BY:	DATE:
SC	MAR 26
APPROVED:	FIG:
JM	A-2

H:\Project\1005\Analysis\Water_Elevations\2025\3-WL5-6D.grf



Note:
1. Precipitation measured at Environment Canada's Robertson Creek (1995-2018) and Port Alberni (AUT) (2018-present) stations.

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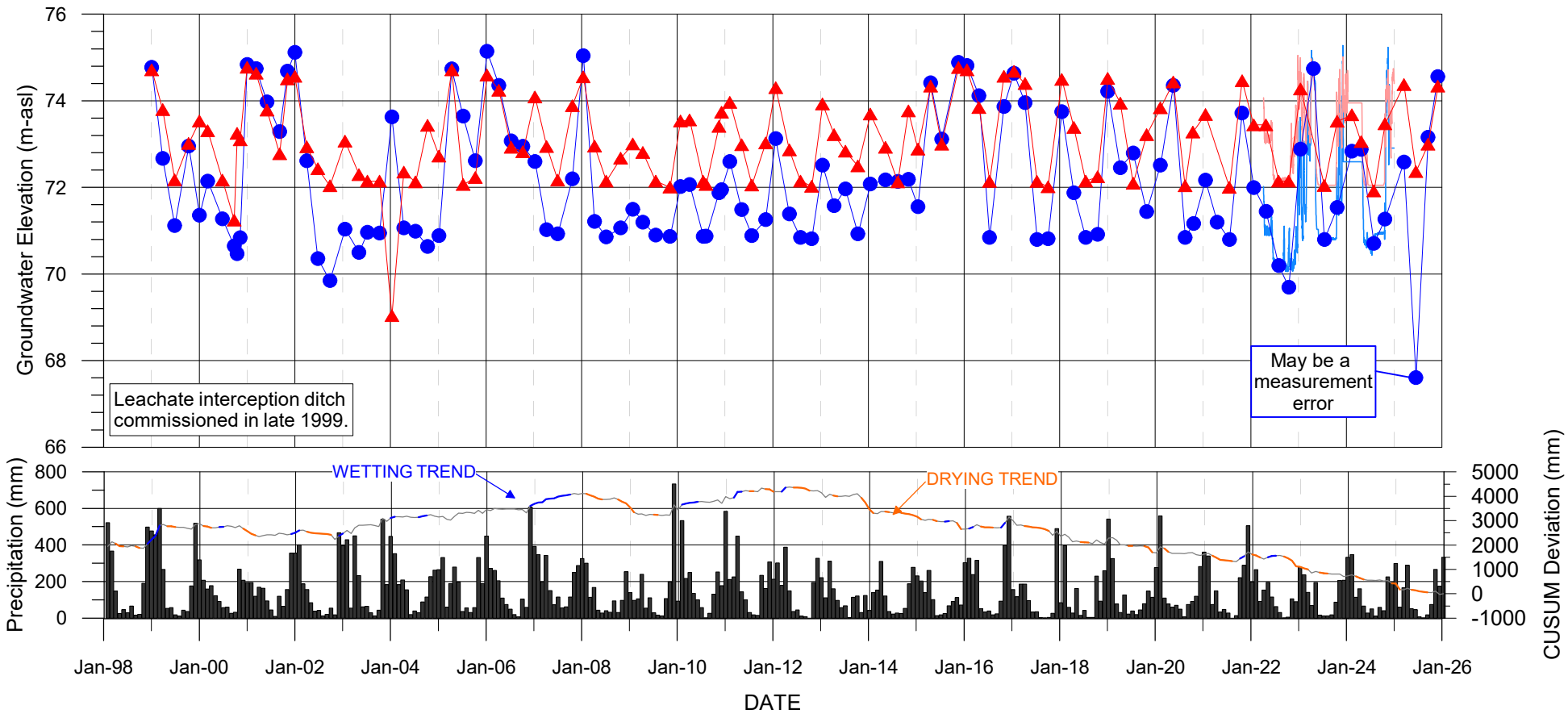
GROUNDWATER ELEVATIONS FOR NORTHERN MONITORING WELLS MW94-5, MW94-6 AND MW02-4 AND LANDFILL MONITORING WELLS BH00-1C AND BH00-2C

BY:	DATE:
SC	MAR 26
APPROVED:	FIG:
JM	A-3

H:\Project\1005\Analysis\Water_Elevations\20254-WL98.grf

NOTE: Higher water levels in 2001 relative to 2000 identified a problem with the operation of the pump in the leachate interception trench. Levels in 2002 dropped after the pump malfunction was rectified. Similar problems indicated for brief periods since 2005.



MW98-9: SURFICIALS
MW98-10: SURFICIALS
MW98-9 SCADA
MW98-10 SCADA

Notes:
1. Precipitation measured at Environment Canada's Robertson Creek (1995-2018) and Port Alberni (AUT) (2018-present) stations.

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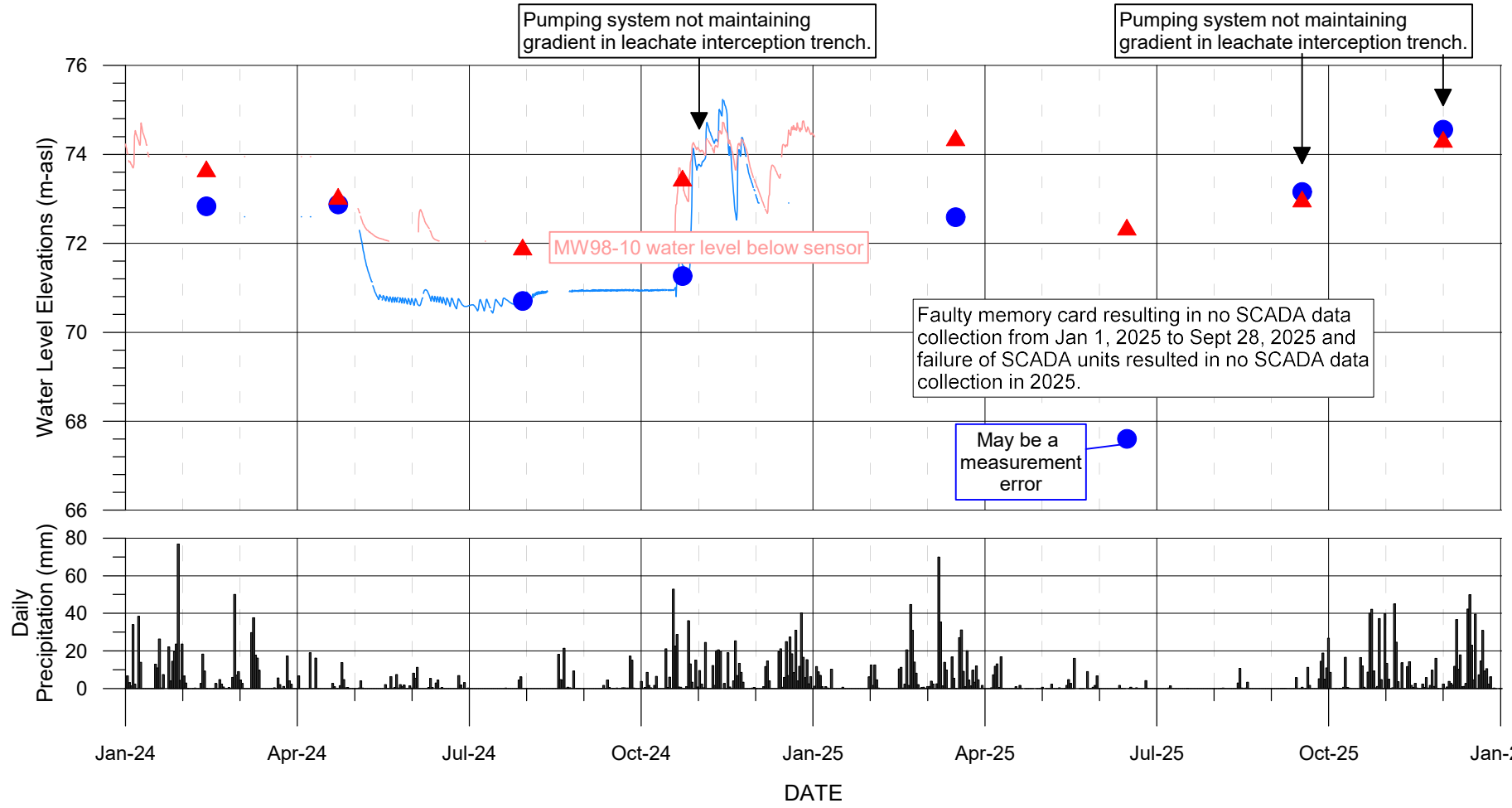
GROUNDWATER ELEVATIONS FOR NORTHERN MONITORING WELLS MW98-9 AND MW98-10

BY:	DATE:
SC	MAR 26
APPROVED:	FIG:
JM	A-4

H:\Project\1005\Analysis\Water_Elevations\2025\5-WL98_2025.grf



MW98-9 Field Measurement
MW98-10 Field Measurement
MW98-9 SCADA
MW98-10 SCADA

Notes:
1. Precipitation measured at Environment Canada's Robertson Creek (1995-2018) and Port Alberni (AUT) (2018-present) stations.
2. Periods with missing SCADA data due to communication loss and/or low batteries.

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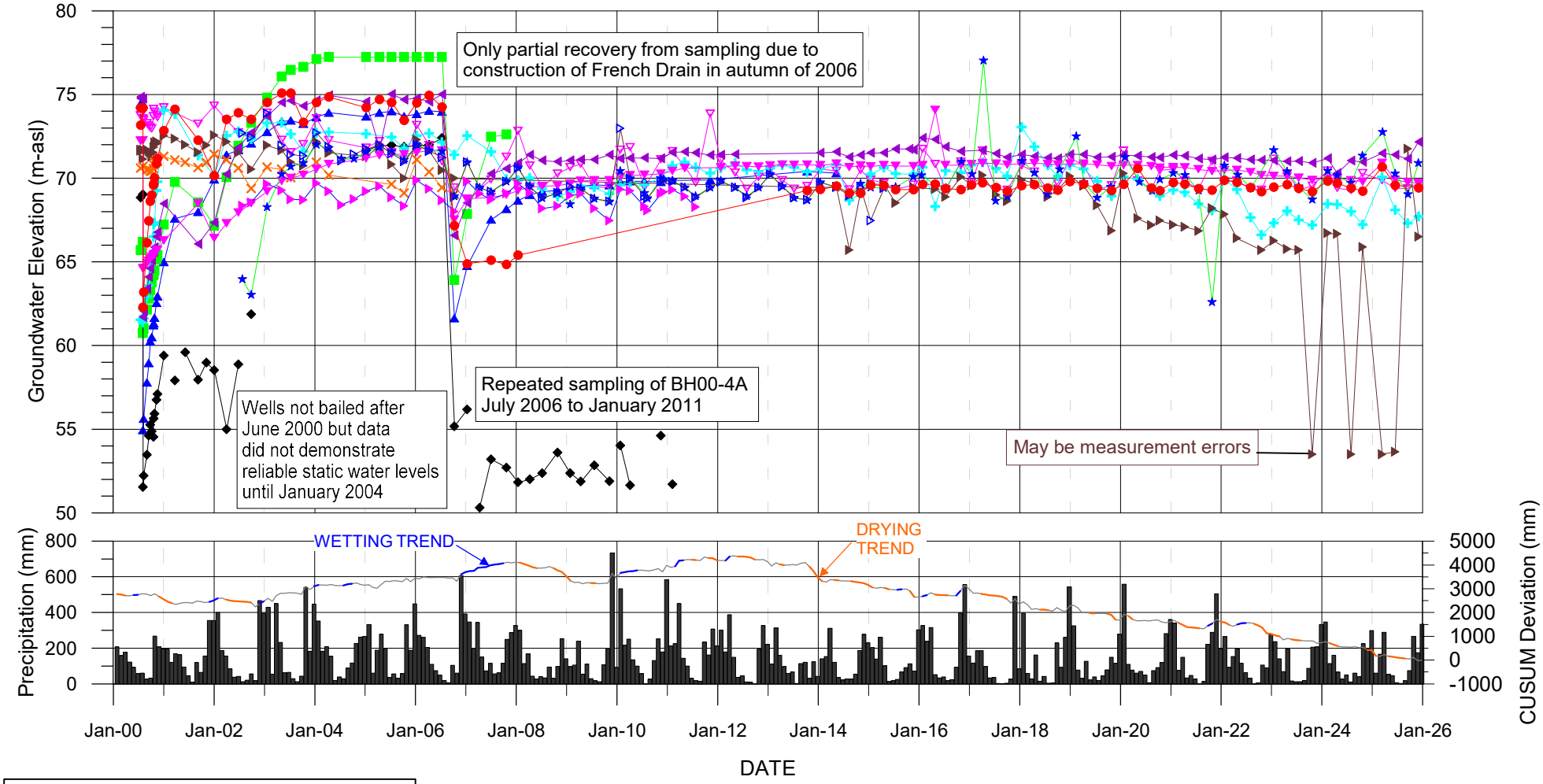
MANUAL AND SCADA GROUNDWATER ELEVATIONS FOR NORTHERN MONITORING WELLS MW98-9 AND MW98-10 IN 2024 AND 2025

BY:	DATE:
SC	MAR 26
APPROVED:	FIG:
JM	A-5

H:\Project\1005\Analysis\Water_Elevations\2025\6-WL00.grf



BH00-1A
BH00-2A
BH00-3A
BH00-4A
BH00-5As
BH00-5Ad
BH00-6A
BH00-7A
BH00-8A
BH00-5B
MW02-1D
MW02-1S
MW02-2

Note:
1. Precipitation measured at Environment Canada's Robertson Creek (1995-2018) and Port Alberni (AUT) (2018-present) stations.

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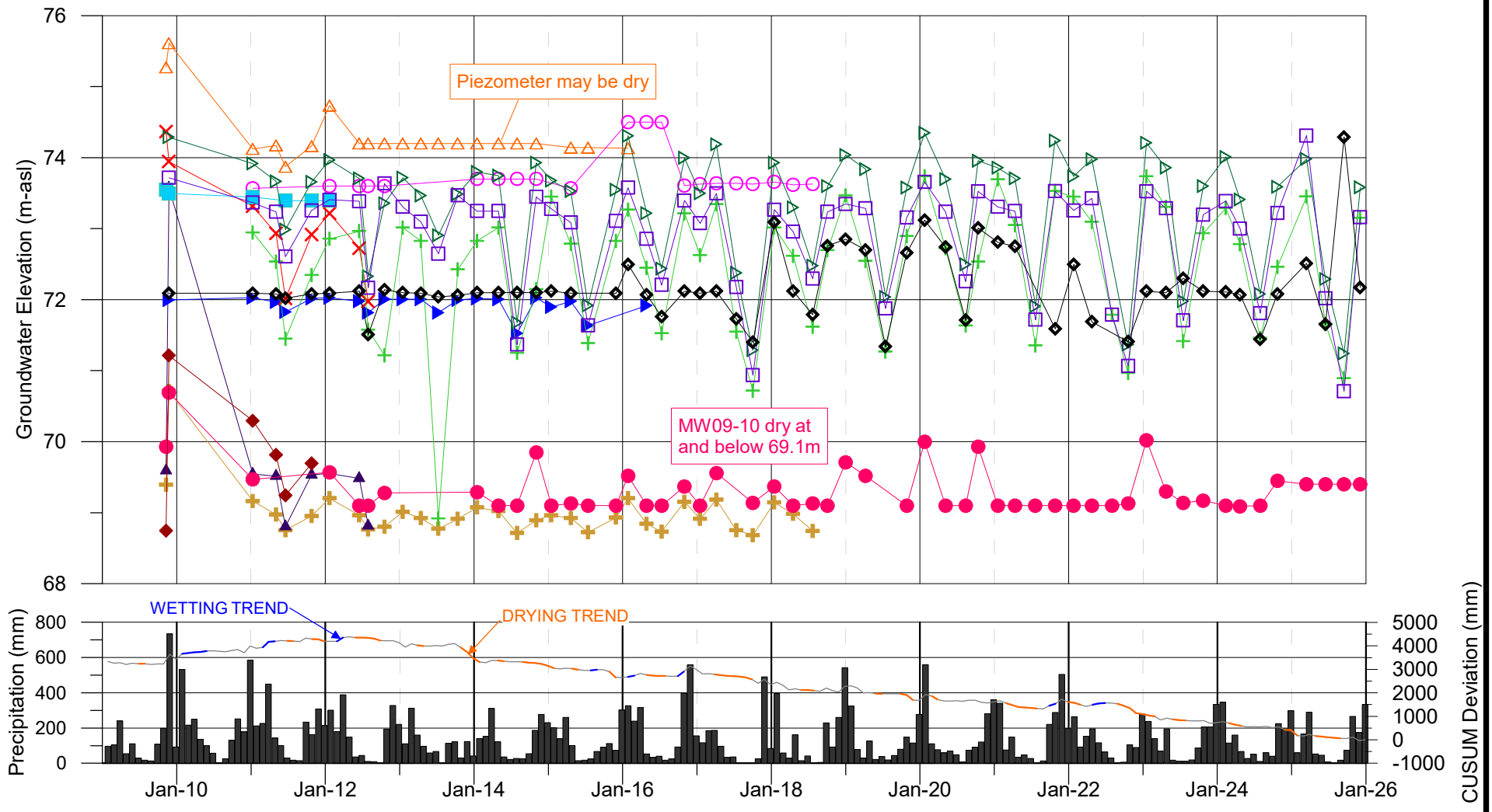
GROUNDWATER ELEVATIONS FOR EXPANSION AREA MONITORING WELLS

BY:	DATE:
SC	MAR 26
APPROVED:	FIG:
JM	A-6

H:\Project\1005\Analysis\Water_Elevations\2025\7-WL_MW_South.grf



MW09-01 MW09-02 MW09-03 MW09-04 MW09-05 MW09-06 MW09-07 MW09-08 MW09-09 MW09-10 MW09-11 MW09-12 MW09-13

Note:
1. Precipitation measured at Environment Canada's Robertson Creek (1995-2018) and Port Alberni (AUT) (2018-present) stations.

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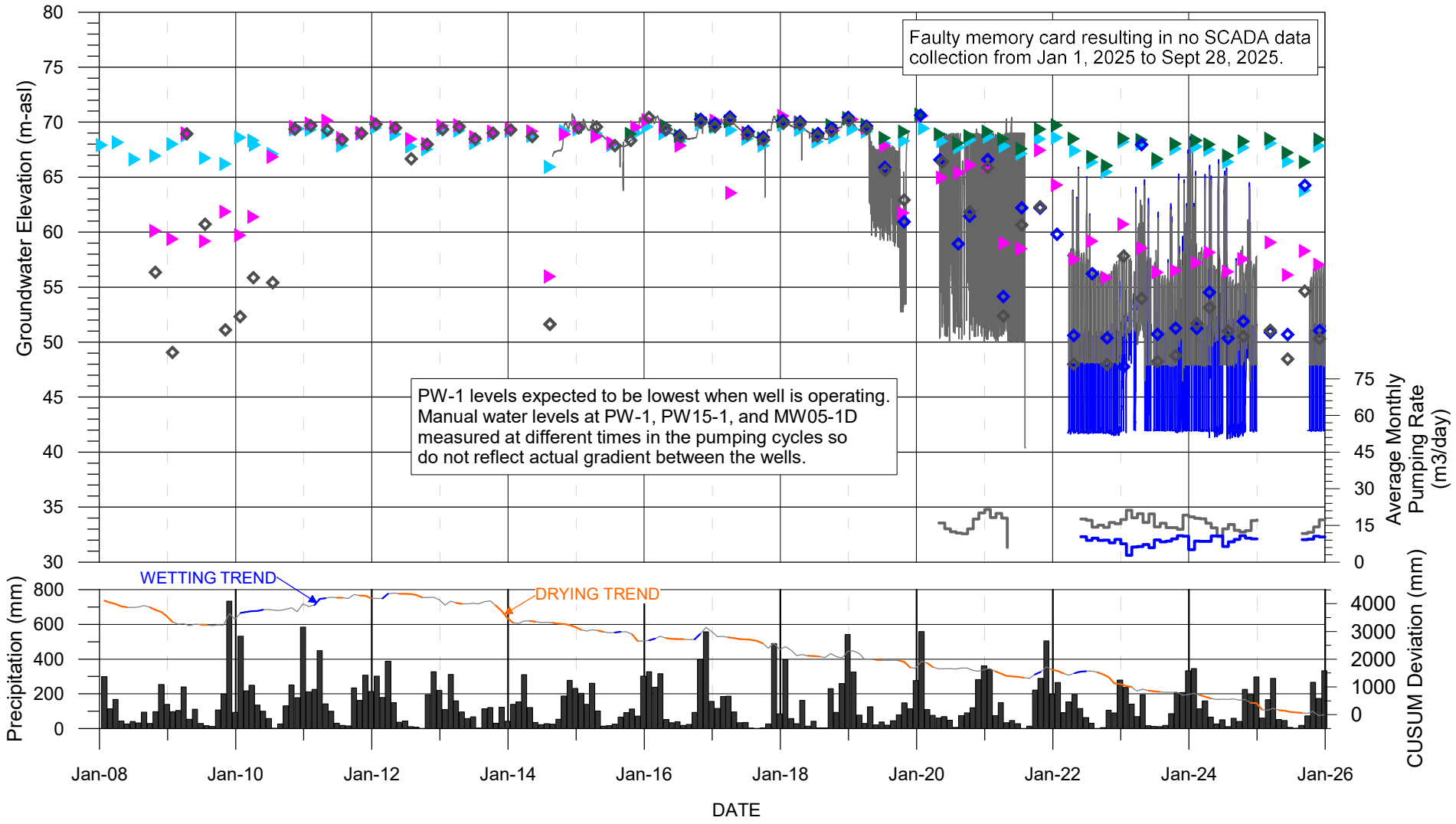
GROUNDWATER ELEVATIONS FOR 2009 OVERBURDEN MONITORING WELLS IN SOUTH EXPANSION AREA

BY:	DATE:
SC	MAR 26
APPROVED:	FIG:
JM	A-7

H:\Project\1005\Analysis\Water_Elevations\20250918-WL_PW_BEDROCK.grf



MW15-1D: BEDROCK
PW-15-1: BEDROCK
PW-1: BEDROCK
MW05-1D: BEDROCK
MW02-3D: BEDROCK
PW15-1 SCADA
PW-1 SCADA
MW05-1D SCADA
MW02-3D SCADA
PW15-1 PUMPING RATE
PW-1 PUMPING RATE

Note:
1. Precipitation measured at Environment Canada's Robertson Creek (1995-2018) and Port Alberni (AUT) (2018-present) stations.

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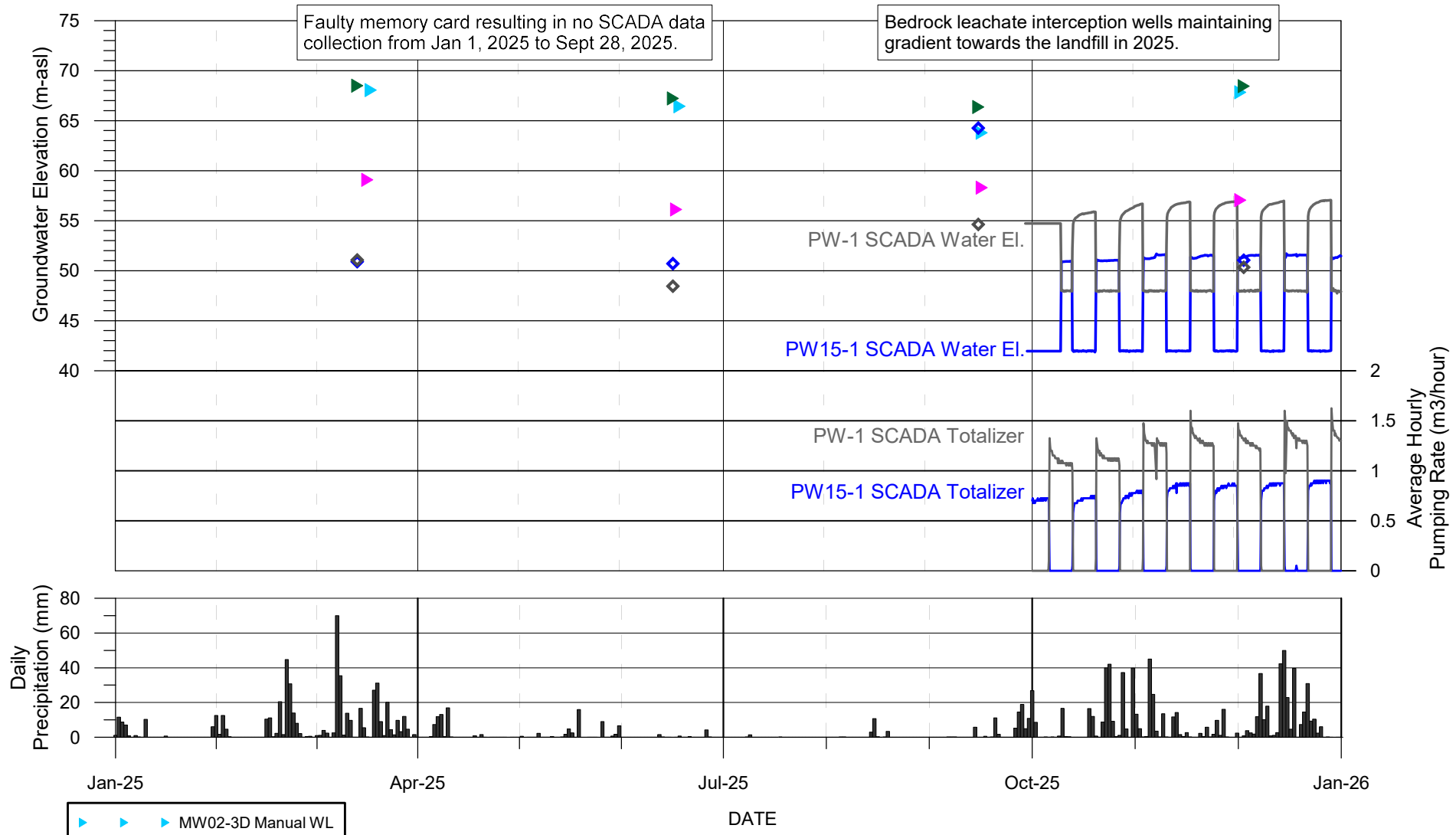
GROUNDWATER ELEVATIONS FOR BEDROCK LEACHATE INTERCEPTION WELL MONITORING PW-1, PW15-1, MW02-3D, MW05-1D, MW15-1D

BY:	DATE:
SC	MAR 26
APPROVED:	FIG:
JM	A-8

H:\Project\1005\Analysis\Water_Elevations\2025\9-WL_PW_BEDROCK_2025.grf



MW02-3D Manual WL
MW05-1D Manual WL
MW15-1D Manual WL
PW-15-1 Manual WL
PW-1 Manual WL
MW02-3D SCADA
MW05-1D SCADA

Notes:
1. Precipitation measured at Environment Canada's Robertson Creek (1995-2018) and Port Alberni (AUT) (2018-present) stations.
2. Periods with missing SCADA data due to communication loss and/or low batteries.

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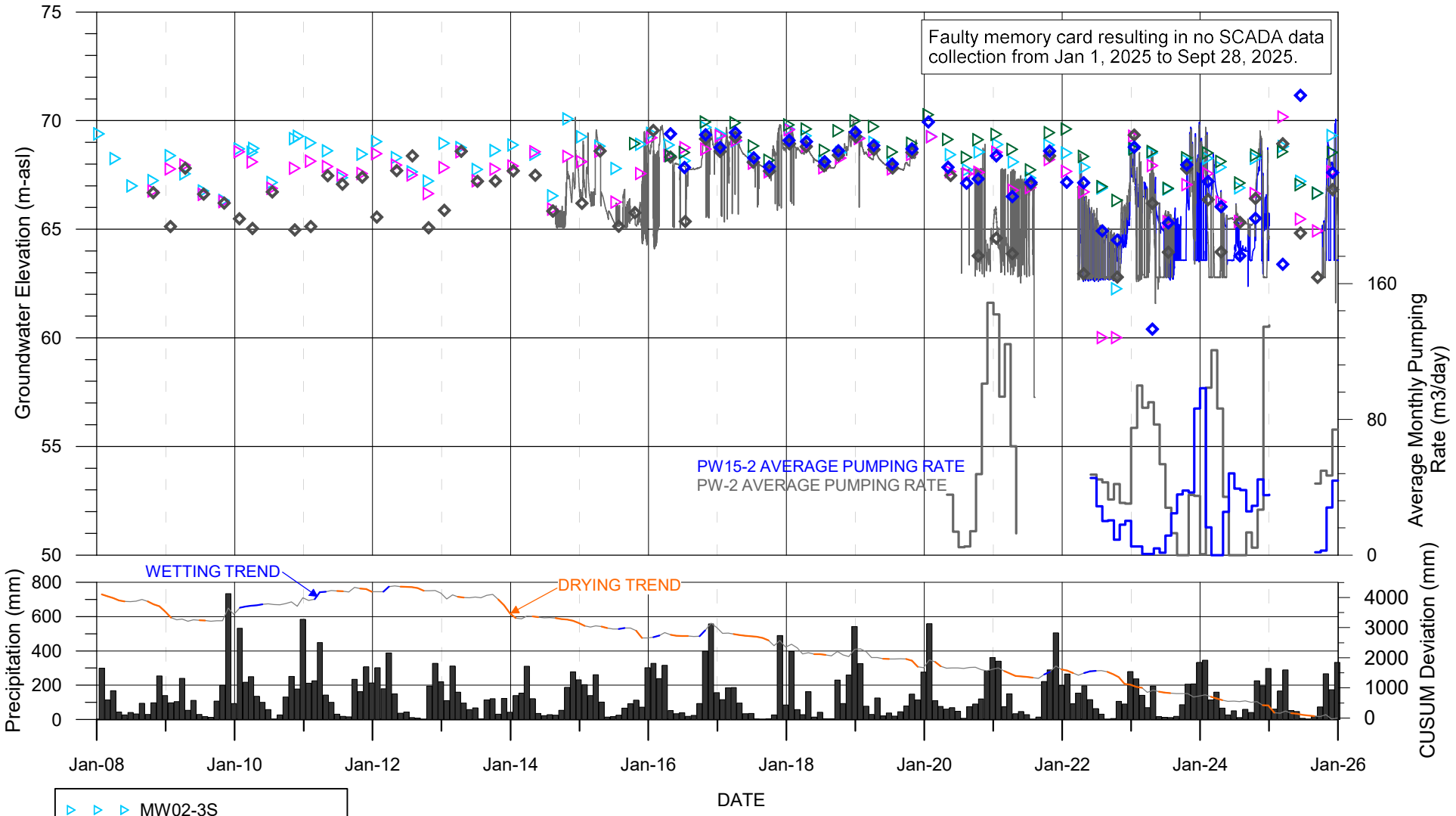
MANUAL AND SCADA GROUNDWATER ELEVATIONS FOR BEDROCK LEACHATE INTERCEPTION WELL MONITORING PW-1, PW15-1, MW02-3D, MW05-1D, MW15-1D IN 2025

BY:	DATE:
RM	MAR 26
APPROVED:	FIG:
JM	A-9

H:\Project\1005\Analysis\Water_Elevations\2025\10-WL_PW_Surfs.grf



- MW02-3S
- MW05-1S : SURFICIALS
- MW15-1S : SURFICIALS
- PW15-2 : SURFICIALS
- PW-2 : SURFICIALS
- PW15-2 SCADA
- PW-2 SCADA

Note:
1. Precipitation measured at Environment Canada's Robertson Creek (1995-2018) and Port Alberni (AUT) (2018-present) stations.

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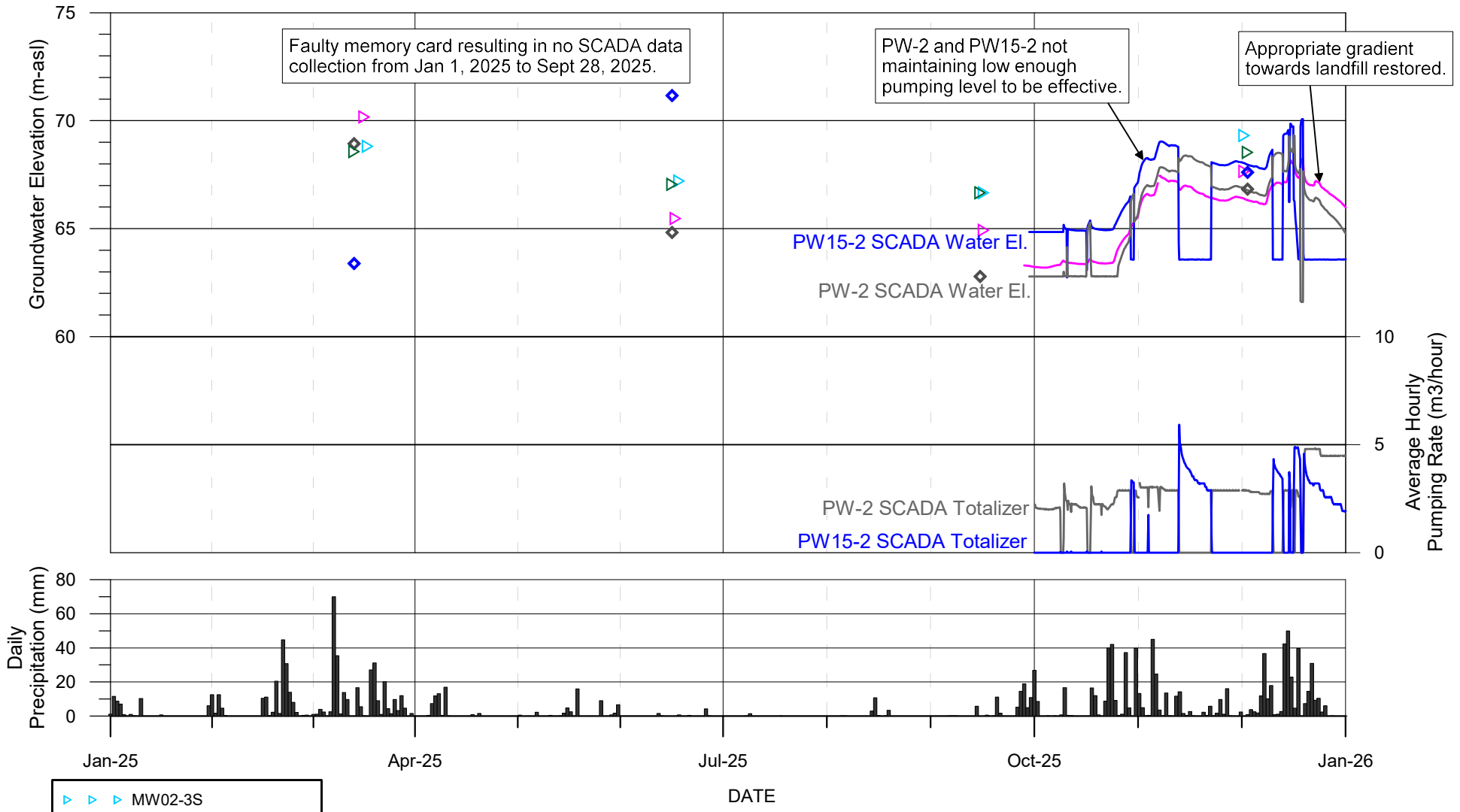
GROUNDWATER ELEVATIONS FOR SURFICIAL SEDIMENT INTERCEPTION WELL MONITORING PW-2, PW15-2, MW02-3S, MW05-1S, MW15-1S

BY:	DATE:
SC	MAR 26
APPROVED:	FIG:
JM	A-10

H:\Project\1005\Analysis\Water_Elevations\2025\11-WL_PW_Surfs_2025.grf



- MW02-3S
- MW05-1S : SURFICIALS
- MW15-1S : SURFICIALS
- PW15-2 : SURFICIALS
- PW-2 : SURFICIALS
- MW05-1S SCADA
- MW02-3S SCADA

Notes:
1. Precipitation measured at Environment Canada's Robertson Creek (1995-2018) and Port Alberni (AUT) (2018-present) stations.
2. Periods with missing SCADA data due to communication loss and/or low batteries.

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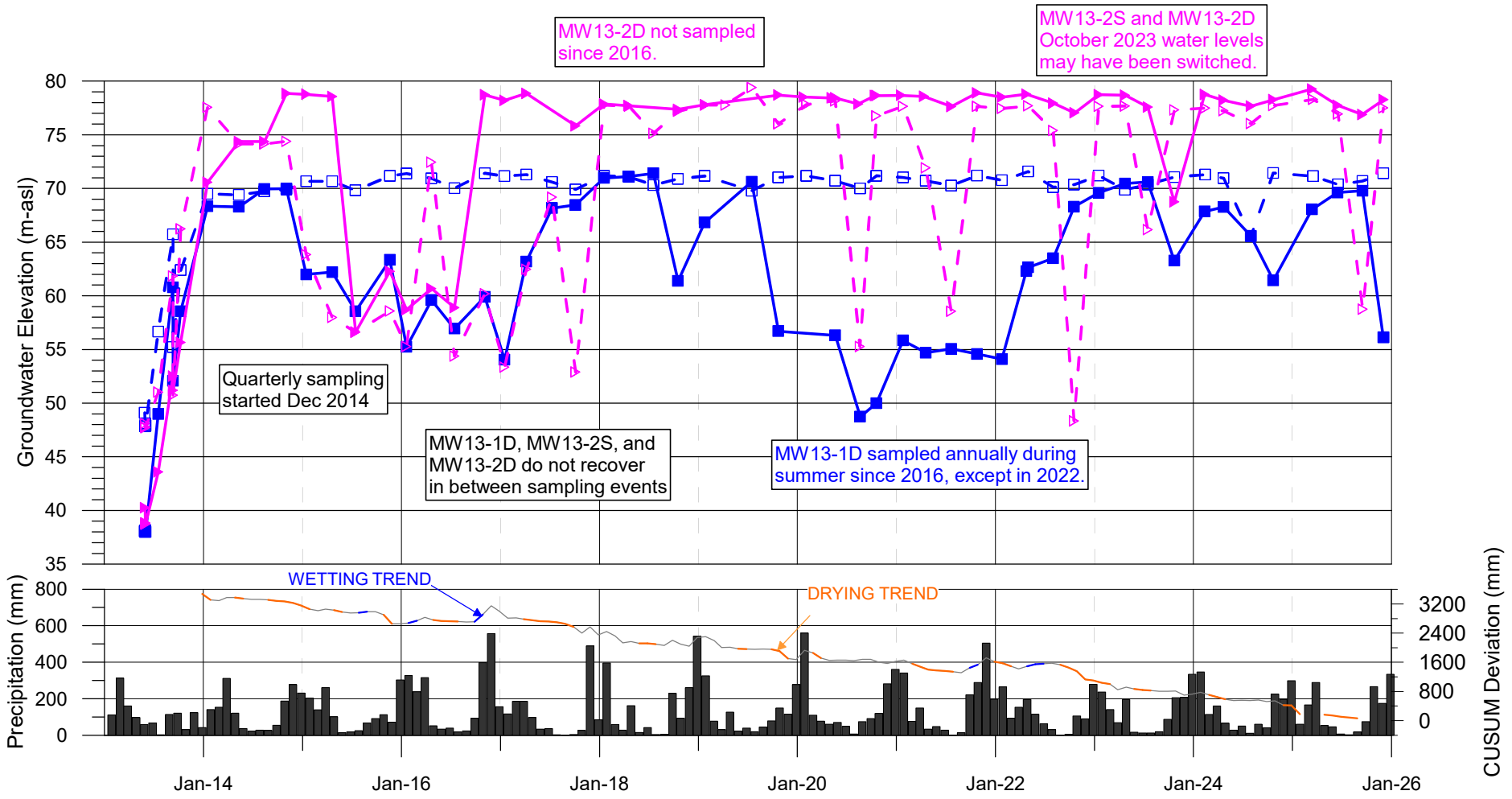
MANUAL AND SCADA GROUNDWATER ELEVATIONS FOR SURFICIAL SEDIMENT INTERCEPTION WELL MONITORING PW-2, PW15-2, MW02-3S, MW05-1S, MW15-1S IN 2025

BY:	DATE:
RM	MAR 26
APPROVED:	FIG:
JM	A-11

H:\Project\1005\Analysis\Water_Elevations\2025\12-MW13.grf



MW13-1D
MW13-1S
MW13-2D
MW13-2S

Note:
1. Precipitation measured at Environment Canada's Robertson Creek (1995-2018) and Port Alberni (AUT) (2018-present) stations.

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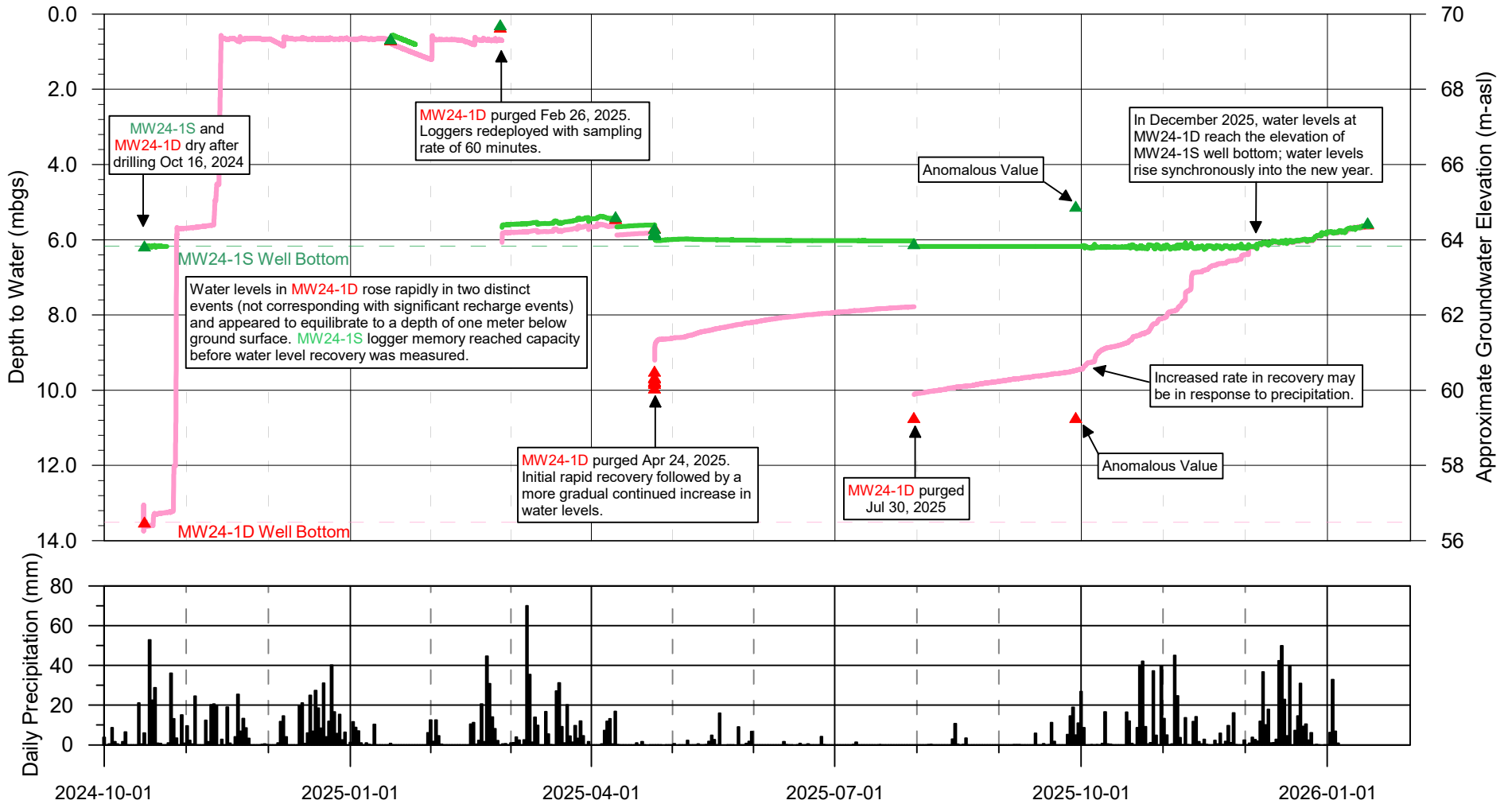
GROUNDWATER ELEVATIONS FOR NORTHEASTERN BEDROCK MONITORING WELLS MW13-1 AND MW13-2

BY:	DATE:
SC	MAR 26
APPROVED:	FIG:
JM	A-12

H:\Project\1005\Tenure\2024\Drilling\Data\Hydrograph Longterm Recovery_v2.gpj



MW24-1S Manual
MW23-1S Logger
MW24-1D Manual
MW24-1D Logger

Note:
1. Precipitation measured at Environment Canada's Port Alberni (AUT) station.
2. Well elevation has not been surveyed, but is estimated based on the topography.

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GROUNDWATER ELEVATIONS FOR NEW MONITORING WELLS MW24-1S AND MW24-1D

BY:	DATE:
JC/RM	MAR 26
APPROVED:	FIG:
JM	A-13

APPENDIX B
CHEMISTRY MONITORING DATA TABLES AND PLOTS

APPENDIX B - LIST OF TABLES

TABLE B-1

INORGANIC CHEMISTRY DATA FOR LEACHATE AND EXPANSION AREA DRAIN

SAMPLE DATE						Lagoon Inlet				Expansion Area Drain			
		RECEIVING WATER CRITERIA				18-Mar-25	16-Jun-25	15-Sep-25	01-Dec-25	18-Mar-25	16-Jun-25	15-Sep-25	01-Dec-25
LAB NAME	UNITS	GCDWQ[1]	AQUATIC LIFE (FWAL)[2]	CSR DRINKING WATER (DW)[3]	CSR AQUATIC LIFE (AW)[3]	ALS			ALS	ALS	ALS	ALS	ALS
PHYSICAL TESTS													
pH - Field	pH	7.0 - 10.5	6.5 - 9.0	-	-	7.07			7.00	7.16	**5.96**	7.83	7.4
pH - Lab	pH	7.0 - 10.5	6.5 - 9.0	-	-	7.67			7.89	7.01	7.74	7.5	**6.9**
EC - Field	µS/cm	-	-	-	-	512	DRY	DRY	616	153	349.6	500	210
EC - Lab	µS/cm	-	-	-	-	807			997	255	470	605	304
Total Hardness ($CaCO_3$)	mg/L	-	-	-	-	231			233	101	201	279	119
Total Dissolved Solids	mg/L	500	-	-	-	469			**580**	177	298	378	198
Temperature - Field	°C	-	-	-	-	7.4			7.1	6.4	12.6	17.7	10.9
DISSOLVED ANIONS													
Alkalinity	mg/L $CaCO_3$	-	-	-	-	292			333	111	211	282	130
Chloride	mg/L	250	150	250	1500	71			98.5	6.07	13.3	18.7	8.33
Sulphate	mg/L	500	309	500	3090	1.9			5.13	9.09	11.7	13.4	9.55
CATIONS													
Calcium	mg/L	-	-	-	-	71			71.1	33.2	65.1	90.6	39
Magnesium	mg/L	-	-	-	-	13			13.5	4.49	9.38	12.8	5.31
Potassium	mg/L	-	-	-	-	14.6			31.7	3.25	7.64	5.58	4.28
Sodium	mg/L	200	-	200	-	63.5			76.1	8.22	13.3	18.4	9.83
TOTAL METALS													
Aluminum	mg/L	2.9	0.18	9.5	-	0.0061			0.0096	0.0317	0.0206	0.0073	<0.003
Antimony	mg/L	0.006	0.074	0.006	0.09	0.00042			0.00047	<0.0001	<0.0001	<0.0001	0.00011
Arsenic	mg/L	0.01	0.005	0.01	0.05	0.00095			0.00072	<0.0001	0.00018	0.00014	<0.0001
Barium	mg/L	2	1	1	10	0.0608			0.0804	0.0145	0.0342	0.0449	0.0205
Beryllium	mg/L	-	0.00013	0.008	0.0015	<0.0001			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Boron	mg/L	5	1.2	5	12	0.456			0.664	0.155	0.264	0.326	0.184
Cadmium	mg/L	0.007	0.00031	0.005	0.0035	0.0000186			0.000020	0.000016	0.000036	0.000058	0.000023
Chromium	mg/L	0.05	0.0025	0.05	0.01	0.0013			0.00124	<0.0005	<0.0005	<0.0005	<0.0005
Cobalt	mg/L	-	0.00063	0.001	0.04	*0.0027*			*0.00271*	0.0004	*0.00193*	*0.00147*	0.00085
Copper	mg/L	1	0.0013	1.5	0.07	0.00378			0.00505	0.00174	0.00243	0.00314	0.00161
Iron	mg/L	0.1	1	6.5	-	**3.17**			**0.75**	0.052	**0.361**	0.073	0.037
Lead	mg/L	0.005	0.0044	0.01	0.16	<0.00005			<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Lithium	mg/L	-	-	0.008	-	<0.001			<0.001	<0.001	<0.001	<0.001	<0.001
Manganese	mg/L	0.02	1.33	1.5	-	***3.13***			***2.64***	**0.74**	***2.65***	***3.05***	***1.59***
Mercury	µg/L	1	0.02	1	0.25	0.0127			0.015	<0.005	<0.005	0.0066	0.0055
Molybdenum	mg/L	-	7.6	0.25	10	0.000164			0.000192	0.000068	0.000162	0.000199	0.000112
Nickel	mg/L	-	0.0061	0.08	1.10	0.00417			0.00598	0.0006	0.00098	0.00126	0.00062
Selenium	mg/L	0.05	0.002	0.01	0.02	0.000159			0.000101	<0.00005	<0.00005	<0.00005	<0.00005
Silver	mg/L	-	0.00012	0.02	0.0150	<0.00001			0.000021	<0.00001	0.000046	<0.00001	<0.00001
Strontium	mg/L	7	-	2.5	-	0.265			0.267	0.147	0.268	0.391	0.163
Thallium	mg/L	-	-	-	0.003	<0.00001			<0.00001	<0.00001	0.000020	0.000039	0.000013
Tin	mg/L	-	-	2.5	-	<0.0001			0.00013	<0.0001	<0.0001	<0.0001	<0.0001
Titanium	mg/L	-	-	-	1	<0.0003			<0.0003	0.00382	0.00075	0.00032	<0.0003
Tungsten	mg/L	-	-	0.003	-	<0.0001			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Uranium	mg/L	0.02	0.0085	0.02	0.085	0.000038			0.000047	0.000022	0.000078	0.000099	0.000037
Vanadium	mg/L	-	-	0.02	-	0.00086			0.00108	<0.0005	0.00116	0.00064	<0.0005
Zinc	mg/L	5	0.034	3	0.90	<0.003			0.0201	<0.003	<0.003	<0.003	<0.003
NUTRIENTS													
Nitrate	mg/L as N	10	3	10	400	3.49			6.94	1.11	2.38	3.66	1.95
Ammonia Nitrogen	mg/L as N	-	1.84	-	11.3	11.7			15	1.89	2.76	1.91	1.97
Total Phosphorus	mg/L as P	-	0.005	-	-	0.0243			0.147	0.00528	0.0284	**0.0053**	0.0082
POLLUTANT TESTS													
Chemical Oxygen Demand	mg/L as O	-	-	-	-	71			11	10	14	21	<10
Total Organic Carbon	mg/L as O	-	-	-	-	24.2			21	2.67	4.02	4.81	2.48

H:\Project\1005\Analysis\Chemistry\2025\[Tables_B-1 to B-6.xlsx]Table B-1 Leachate+ExpDrain

NOTES:

Bold denotes parameters which exceed GCDWQ water quality guideline. Underline denotes parameters which exceed BC FWAL guideline. FWAL guideline for arsenic not considered relevant for groundwater.
Italics denotes parameters which exceed BC CSR DW standard. Yellow highlight denotes parameters which exceed BC CSR AW standard. "-" denotes parameter was not analysed, or a receiving water criteria was not applicable.

1. GCDWQ = Guidelines for Canadian Drinking Water Quality (Health Canada, 2025). Lowest guideline of maximum acceptable concentration or aesthetic objective is shown.
2. Approved and Working Water Quality Guidelines, Science and Information Branch, Environmental Protection Division, BC Ministry of Environment.
   Available: https://www2.gov.bc.ca/assets/gov/environment/air-land-water/water/waterquality/water-quality-guidelines/approved-wqgs/wqg_summary_aquaticlife_wildlife_agri.pdf
   Aquatic life guidelines for cadmium (dissolved), cobalt (dissolved)manganese, silver, and sulphate are based on total hardness, which varies between samples. Guideline for lead (dissolved) varies with hardness and DOC. Guidelines for aluminum and zinc (dissolved) vary with hardness, pH and DOC. Ammonia and sulphate guidelines vary with hardness, temperature, and pH.
   Values are based on average hardness of 166 mg/L, a pH of 7, DOC of 3.5 mg/L, and temperature of 10˚ C.
   Phosphorus FWAL guideline for creeks from Phosphorous Management in Vancouver Island Streams. Available: https://www2.gov.bc.ca/assets/gov/environment/air-land-water/water/waterquality/water-quality-reference-documents/phosphorous_management_vi_streams_guidance_2014.pdf. BC MOE, April 2014. Monthly average of May to September samples for total phosphorus should not exceed 0.005 mg/L, and maximum total phosphorus for this period should not exceed 0.01 mg/L in any one sample. May to September results compared against stringent guideline of 0.005 mg/L.
3. Per Schedule 3.2 of Stage 13 Amendment to Contaminated Sites Regulation (CSR), March 2023. Available: https://www.bclaws.gov.bc.ca/civix/document/id/lc/statreg/375_96_08
   CSR AW standards for cadmium, copper, lead, nickel, silver and zinc are based on total hardness, which varies between samples.
   Likewise, CSR AW ammonia standards vary with pH. Value shown appropriate for hardness of 166 mg/L-CaCO3 and pH of 7.
4. Dissolved copper and nickel FWAL guideline was calculated for each site using the average BC BLM software calculations between January 2020 - January 2022 with sample-specific parameters except for humic acid ratio (assumed value of 10).

TABLE B-2
LEACHATE VOLATILE ORGANIC ANALYSES

						Lagoon Inlet	Expansion Area Drain
SAMPLE DATE	RECEIVING WATER CRITERIA					01-Dec-25	15-Sep-25
LAB NAME	GCDWQ MAC[1]	GCDWQ AO[1]	AQUATIC LIFE (FWAL)[2]	CSR DRINKING WATER (DW)[3]	CSR AQUATIC LIFE (AW)[3]	ALS	ALS
UNITS	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
VOCs							
Acetone	-	-	-	3500	-	34	<20
Bromobenzene	-	-	-	30	-	<1.0	<1.0
Bromochloromethane	-	-	-	-	-	<1.0	<1.0
Bromomethane	-	-	-	5.5	-	<1.0	<1.0
Butylbenzene, n-	-	-	-	200	-	<1.0	<1.0
Butylbenzene, sec-	-	-	-	400	-	<1.0	<1.0
Butylbenzene, tert-	-	-	-	400	-	<1.0	<1.0
Carbon disulfide	-	-	-	400	-	<5.0	<5.0
Chlorobenzene	-	-	-	80	13	<1.0	<1.0
Chloromethane	-	-	-	-	-	<5.0	<5.0
Chlorotoluene, 2-	-	-	-	80	-	<1.0	<1.0
Chlorotoluene, 4-	-	-	-	80	-	<1.0	<1.0
Cyclohexane	-	-	-	7	-	<1.0	<1.0
Dibromo-3-chloropropane, 1,2-	-	-	-	0.5	-	<0.50	<0.50
Dibromobenzene, 1,3-	-	-	-	1.5	-	<10	<10
Dibromobenzene, 1,4-	-	-	-	40	-	<10	<10
Dibromomethane	-	-	-	-	-	<1.0	<1.0
1,2-Dichlorobenzene	-	-	0.7	200	7	<0.40	<1.0
1,3-Dichlorobenzene	-	-	150	-	1500	<0.40	<1.0
1,4-Dichlorobenzene	5	1	26	5	260	<0.40	<1.0
Dichlorodifluoromethane	-	-	-	800	-	<1.0	<1.0
1,2-Dichloropropane	-	-	-	5	-	<1.0	<1.0
Dichloropropane, 1,3-	-	-	-	80	-	<1.0	<1.0
Dichloropropane, 2,2-	-	-	-	-	-	<1.0	<1.0
Dichloropropylene, 1,1-	-	-	-	-	-	<1.0	<1.0
cis&trans-1,3-Dichloropropene	-	-	-	1.5	-	<1.5	<1.5
cis-1,3-Dichloropropene	-	-	-	1.5	-	<1.0	<1.0
Diethyl ether	-	-	-	800	-	<1.0	<1.0
Ethyl acetate	-	-	-	3500	-	<1.0	<1.0
Hexachlorobutadiene	-	-	1	2	15	<0.20	<1.0
Hexanone, 2-	-	-	-	20	-	<10	<10
Methyl ethyl ketone [MEK]	-	-	-	2500	-	<20	<20
Methyl isobutyl carbinol [MIBC]	-	-	-	-	-	<20	<20
Methyl isobutyl ketone [MIBK]	-	-	-	-	-	<20	<20
Octane, n-	-	-	-	-	-	<1.0	<1.0
Pentane, n-	-	-	-	-	-	<1.5	<1.0
1,1,2,2-Tetrachloroethane	-	-	-	0.8	-	<1.0	<1.0
1,1,1,2-Tetrachloroethane	-	-	-	6	-	<0.20	<0.20
Trichloro-1,2,2-trifluoroethane, 1,1,2- [Freon 113]	-	-	-	100000	-	<1.0	<1.0
Trichlorobenzene, 1,2,3-	-	-	8	80	3	<0.40	<1.0
Trichlorobenzene, 1,2,4-	-	-	24	5.5	250	<0.40	<1.0
1,1,2-Trichloroethane	-	-	-	3	-	<1.0	<1.0
Trichlorofluoromethane	-	-	-	1000	-	<1.0	<1.0
Trichloropropane, 1,1,2-	-	-	-	20	-	<1.0	<1.0
Trichloropropane, 1,2,3-	-	-	-	0.5	-	<0.50	<0.50
Trichloropropylene, 1,2,3-	-	-	-	10	-	<1.0	<1.0
VOCs (DRY CLEANING)							
Carbon Tetrachloride	2	-	-	2	130	<1.0	<1.0
Chloroethane	-	-	-	-	-	<1.0	<1.0
1,1-Dichloroethane	-	-	100	30	-	<1.0	<1.0
1,1-Dichloroethene	-	-	-	14	-	<1.0	<1.0
cis-1,2-Dichloroethene	5	-	-	8	-	<1.0	<1.0
tran GCDWQ = Guidelines for Canadian Drinking Wa	5	-	-	80	-	<1.0	<1.0
Dichloromethane	50	-	-	50	980	<1.0	<1.0
trans-1,3-Dichloropropene	-	-	-	1.5	-	<1.0	<1.0
Tetrachloroethene	10	-	-	3	1100	<1.0	<1.0
1,1,1-Trichloroethane	-	-	-	8000	-	<1.0	<1.0
Trichloroethylene	5	-	-	5	200	<1.0	<1.0
Vinyl Chloride	2	-	-	2	-	<0.40	<0.40

H:\Project\1005\Analysis\Chemistry\2025\[Tables_B-1 to B-6.xlsx]Table B-2 LeachateOrganic A

NOTES:

Green highlight denotes parameters with values above the detection limit. **Bold** denotes parameters which exceed GCDWQ water quality guideline. Underline denotes parameters which exceed BC FWAL guideline. FWAL guideline for arsenic not considered relevant for groundwater. *Italics* denotes parameters which exceed BC CSR DW standard. Yellow highlight denotes parameters which exceed BC CSR AW standard. "-" denotes parameter was not analysed, or a receiving water criteria was not applicable.

1. GCDWQ = Guidelines for Canadian Drinking Water Quality (Health Canada, 2025). Lowest guideline of maximum acceptable concentration or aesthetic objective is shown.
2. Approved and Working Water Quality Guidelines, Science and Information Branch, Environmental Protection Division, BC Ministry of Environment. Available: https://www2.gov.bc.ca/assets/gov/environment/air-land-water/water/waterquality/water-quality-guidelines/approved-wqgs/wqg_summary_aquaticlife_wildlife_agri.pdf
3. Per Schedule 3.2 of the Contaminated Sites Regulation (CSR), March 2023. Available: https://www.bclaws.gov.bc.ca/civix/document/id/lc/statreg/375_96_08

TABLE B-3

LEACHATE VOLATILE ORGANIC ANALYSES (CONTINUED)

						Lagoon Inlet	Expansion Area Drain
SAMPLE DATE	RECEIVING WATER CRITERIA					01-Dec-25	15-Sep-25
LAB NAME	GCDWQ MAC[1]	GCDWQ AO[1]	AQUATIC LIFE (FWAL)[2]	CSR DRINKING WATER (DW)[3]	CSR AQUATIC LIFE (AW)[3]	ALS	ALS
UNITS	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
VOCs (FUEL)							
BTEX+Styrene, total	-	-	-	-	-	4.7	<1.5
BTEX, total	-	-	-	-	-	4.7	<1.0
Benzene	5	-	40	5	400	<0.50	<0.50
Butadiene, 1,3-	-	-	-	1	-	<0.20	<0.20
Cymene, p-	-	-	-	-	-	<1.0	<1.0
Decane, n-	-	-	-	-	-	<1.0	<1.0
Dibromoethane, 1,2-	-	-	-	0.5	-	<0.20	<0.20
1,2-Dichloroethane	5	-	100	5	1000	<1.0	<1.0
Ethylbenzene	140	1.6	200	140	2000	<0.50	<0.50
Heptane, n-	-	-	-	-	-	<1.0	<1.0
Hexane, n-	-	-	-	-	-	<1.0	<1.0
Isopropylbenzene	-	-	-	400	-	<1.0	<1.0
Methyl t-Butyl Ether	-	15	3400	95	34000	<0.50	<0.50
Methylcyclohexane	-	-	-	-	-	<1.0	<1.0
Nonane, n-	-	-	-	1	-	<1.0	<1.0
Propylbenzene, n-	-	-	-	400	-	<1.0	<1.0
Styrene	-	-	72	800	720	<0.50	<0.50
Toluene	60	24	0.5	60	5	4.69	<0.40
Trimethylbenzene, 1,2,3-	-	-	-	-	-	<1.0	<1.0
Trimethylbenzene, 1,2,4-	-	-	-	-	-	<1.0	<1.0
Trimethylbenzene, 1,3,5-	-	-	-	40	-	<1.0	<1.0
m&p-Xylene	-	-	-	-	-	<0.40	<0.40
o-Xylene	-	-	-	-	-	<0.30	<0.30
Xylenes	90	20	30	90	300	<0.50	<0.50
VOCs (THMs)							
Bromodichloromethane	-	-	-	100	-	<1.0	<1.0
Bromoform	-	-	-	100	-	<1.0	<1.0
Chloroform	-	-	1.8	100	20	<1.0	<1.0
Dibromochloromethane	-	-	-	100	-	<1.0	<1.0
Trihalomethanes [THMs], total	100	-	-	100	-	<2.0	<2.0
SEMI-VOLATILE ORGANIC							
Biphenyl	-	-	-	2000	-	<0.20	-
Bromophenylphenyl ether, 4-	-	-	-	-	-	<0.40	-
Chloroaniline, 4-	-	-	-	0.8	-	<0.40	-
Chloronaphthalene, 1-	-	-	-	-	-	<0.10	-
Chloronaphthalene, 2-	-	-	-	300	-	<0.10	-
Chlorophenylphenyl ether, 4-	-	-	-	-	-	<0.40	-
Dichlorobenzidine, 3,3'-	-	-	-	0.35	-	<0.40	-
Dinitrotoluene, 2,4-	-	-	-	0.5	-	<0.40	-
Dinitrotoluene, 2,6-	-	-	-	0.1	-	<0.40	-
Diphenyl ether	-	-	-	-	-	<0.40	-
Hexachlorobenzene	-	-	-	0	-	<0.040	-
Hexachlorocyclopentadiene	-	-	-	25	-	<0.40	-
Hexachloroethane	-	-	-	3	-	<0.40	-
Indole	-	-	-	-	-	<0.40	-
Isophorone	-	-	-	150	-	<0.40	-
Nitroacenaphthene, 5-	-	-	-	-	-	<0.40	-
Nitrobenzene	-	-	-	8	-	<0.020	-
Nitrosodi-n-propylamine, N-	-	-	-	0.02	-	<0.40	-
bis(2-Chloro-1-methylethyl) ether	-	-	-	150	-	<0.40	-
bis(2-Chloroethoxy)methane	-	-	-	10	-	<0.40	-
bis(2-Chloroethyl) ether	-	-	-	0.15	-	<0.40	-

H:\Project\1005\Analysis\Chemistry\2025\[Tables_B-1 to B-6.xlsx]Table B-3 LeachateOrganic B

NOTES:

Green highlight denotes parameters with values above the detection limit. **Bold** denotes parameters which exceed GCDWQ water quality guideline. Underline denotes parameters which exceed BC FWAL guideline. FWAL guideline for arsenic not considered relevant for groundwater. *Italics* denotes parameters which exceed BC CSR DW standard. Yellow highlight denotes parameters which exceed BC CSR AW standard. "-" denotes parameter was not analysed, or a receiving water criteria was not applicable.

1. GCDWQ = Guidelines for Canadian Drinking Water Quality (Health Canada, 2025). Lowest guideline of maximum acceptable concentration or aesthetic objective is shown.
2. Approved and Working Water Quality Guidelines, Science and Information Branch, Environmental Protection Division, BC Ministry of Environment.
   Available: https://www2.gov.bc.ca/assets/gov/environment/air-land-water/water/waterquality/water-quality-guidelines/approved-wqgs/wqg_summary_aquaticlife_wildlife_agri.pdf
3. Per Schedule 3.2 of the Contaminated Sites Regulation (CSR), March 2023. Available: https://www.bclaws.gov.bc.ca/civix/document/id/lc/statreg/375_96_08

TABLE B-4

LEACHATE PHENOL AND ACID EXTRACTABLE ANALYSES

SAMPLE DATE	RECEIVING WATER CRITERIA					Lagoon Inlet 01-Dec-25
LAB NAME	GCDWQ[1] MAC	GCDWQ[1] AO	AQUATIC LIFE (FWAL)[2]	CSR DRINKING WATER (DW)[3]	CSR AQUATIC LIFE (AW)[3]	ALS
UNITS	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
CHLORINATED PHENOLICS						
Chlorophenol, 2-	-	-	-	45	19.5	<0.30
Dichlorophenol, 2,4-	-	-	0.6	900	3	<0.20
Dichlorophenol, 2,6-	-	-	2	-	10	<0.20
Methylphenol, 4-chloro-3-	-	-	-	400	-	<0.50
Pentachlorophenol [PCP]	60	30	0.2	60	1	<0.50
Tetrachlorophenol, 2,3,4,5-	-	-	0.4	-	2	<0.50
Tetrachlorophenol, 2,3,4,6-	-	-	1.1	100	5.5	<0.50
Tetrachlorophenol, 2,3,5,6-	-	-	0.5	-	2.5	<0.50
Trichlorophenol, 2,3,4-	-	-	0.5	-	2.5	<0.50
Trichlorophenol, 2,3,5-	-	-	0.5	-	2.5	<0.50
Trichlorophenol, 2,4,5-	-	-	0.5	400	2.5	<0.20
Trichlorophenol, 2,4,6-	5	2	1.2	5	6	<0.20
NON-CHLORINATED PHENOLICS						
Dimethylphenol, 2,4-	-	-	-	80	-	<0.50
Dinitrophenol, 2,4-	-	-	-	8	2000	<1.0
Methylphenol, 2-	-	-	-	200	2500	<0.50
Methylphenol, 3+4-	-	-	-	200	700	<0.50
Nitrophenol, 2-	-	-	-	-	-	<0.50
Nitrophenol, 4-	-	-	-	-	-	<0.50
Phenol	-	-	50	1000	2000	<0.50
Phenol, 2-methyl-4,6-dinitro- [DNOC]	-	-	-	1	750	<2.0
PHTHALATE ESTERS						
Butyl benzyl phthalate	-	-	-	80	-	<1.4
Di-n-butyl phthalate	-	-	-	400	190	<1.0
Di-n-octyl phthalate [DNOP]	-	-	-	40	-	<0.40
Diethyl phthalate	-	-	-	3000	-	<0.20
Dimethyl phthalate	-	-	-	-	-	<0.20
bis(2-Ethylhexyl) phthalate [DEHP]	-	-	16	10	160	<0.90
POLYCYCLIC AROMATIC HYDROCARBONS						
Acenaphthylene	-	-	-	250	60	<0.010
Anthracene	-	-	4	1000	1	<0.010
Benzo(a)anthracene	-	-	0.1	0.07	1	<0.010
Benzo(a)pyrene	0.04	-	0.01	0.01	0.1	<0.0050
Benzo(b+j)fluoranthene	-	-	-	0.07	-	<0.010
Benzo(e)pyrene	-	-	-	-	-	<0.010
Benzo(g,h,i)perylene	-	-	-	-	-	<0.010
Benzo(k)fluoranthene	-	-	-	-	-	<0.010
Camphene	-	-	-	-	-	<0.40
Chrysene	-	-	-	7	1	<0.010
Dibenz(a,h)anthracene	-	-	-	0.01	-	<0.0050
Dibenzofuran	-	-	-	4	-	<0.20
Fluoranthene	-	-	4	150	2	<0.010
Fluorene	-	-	12	150	120	0.014
Indeno(1,2,3-cd)pyrene	-	-	-	-	-	<0.010
1-Methylnaphthalene	-	-	-	5.5	-	<0.010
2-Methylnaphthalene	-	-	-	15	-	<0.010
Naphthalene	-	-	1	80	10	<0.050

H:\Project\1005\Analysis\Chemistry\2025\[Tables_B-1 to B-6.xlsx]Table B-4 LeachatePhenol

NOTES:

Green highlight denotes parameters with values above the detection limit. **Bold** denotes parameters which exceed GCDWQ water quality guideline. Underline denotes parameters which exceed BC FWAL guideline. FWAL guideline for arsenic not considered relevant for groundwater. *Italics* denotes parameters which exceed BC CSR DW standard. Yellow highlight denotes parameters which exceed BC CSR AW standard. "-" denotes parameter was not analysed, or a receiving water criteria was not applicable.

1. GCDWQ = Guidelines for Canadian Drinking Water Quality (Health Canada, 2025). Lowest guideline of maximum acceptable concentration or aesthetic objective is shown.
2. Approved and Working Water Quality Guidelines, Science and Information Branch, Environmental Protection Division, BC Ministry of Environment.
   Available: https://www2.gov.bc.ca/assets/gov/environment/air-land-water/water/waterquality/water-quality-guidelines/approved-wqgs/wqg_summary_aquaticlife_wildlife_agri.pdf
3. Per Schedule 3.2 of the Contaminated Sites Regulation (CSR), March 2023. Available: https://www.bclaws.gov.bc.ca/civix/document/id/lc/statreg/375_96_08

TABLE B-5

INORGANIC CHEMISTRY DATA FOR MW02-3S (SURFICIAL)

SAMPLE DATE	UNITS	RECEIVING WATER CRITERIA				18-Mar-25	18-Jun-25	16-Sep-25	04-Dec-25
LAB NAME		GCDWQ[1]	AQUATIC LIFE (FWAL)[2]	CSR DRINKING WATER (DW)[3]	CSR AQUATIC LIFE (AW)[3]	ALS	ALS	ALS	ALS
PHYSICAL TESTS									
pH-Field	pH	7.0 - 10.5	6.5 - 9.0	-	-	7.85	**6.89**	**6.66**	7.26
pH-Lab	pH	7.0 - 10.5	6.5 - 9.0	-	-	7.92	7.63	7.96	7.51
EC-Field	µS/cm	-	-	-	-	94.8	783	875	810
EC-Lab	µS/cm	-	-	-	-	1080	1090	1090	1120
Dissolved Hardness ($CaCO_3$)	mg/L	-	-	-	-	535	474	506	548
Total Dissolved Solids	mg/L	500	-	-	-	**688**	**668**	**678**	**670**
Temperature-Field	°C	-	-	-	-	10.4	11.6	19.1	11.2
DISSOLVED ANIONS									
Alkalinity	mg/L $CaCO_3$	-	-	-	-	509	519	506	539
Chloride	mg/L	250	150	250	1500	67.5	61.5	69.8	67.3
Sulphate	mg/L	500	429	500	4290	14.5	13.6	14.6	13.6
DISSOLVED CATIONS									
Calcium	mg/L	-	-	-	-	143	130	135	141
Magnesium	mg/L	-	-	-	-	43.2	36.2	41	47.6
Potassium	mg/L	-	-	-	-	1.57	1.6	1.9	1.97
Sodium	mg/L	200	-	200	-	55.1	53.3	59.5	67.2
DISSOLVED METALS									
Aluminum	mg/L	2.9	0.41	9.5	-	<0.001	0.0016	0.0048	0.0018
Antimony	mg/L	0.006	0.074	0.006	0.09	<0.0001	0.00014	0.00012	<0.0001
Arsenic	mg/L	0.01	0.005	0.01	0.05	0.00497	0.00483	0.00648	0.00577
Barium	mg/L	2	1	1	10	0.0624	0.0583	0.0638	0.0765
Beryllium	mg/L	-	0.00013	0.008	0.0015	<0.0001	<0.0001	<0.0001	<0.0001
Boron	mg/L	5	1.2	5	12	0.66	0.642	0.718	0.727
Cadmium	mg/L	0.007	0.00069	0.005	0.0040	0.000045	0.000042	0.000049	0.000035
Chromium	mg/L	0.05	0.003	0.05	0.01	<0.0005	<0.0005	<0.0005	<0.0005
Cobalt	mg/L	-	0.00099	0.001	0.04	*0.00845*	*0.0159*	*0.014*	*0.00965*
Copper	mg/L	1	0.0047	1.5	0.09	0.0025	0.00238	0.0034	0.00184
Iron	mg/L	0.1	0.35	6.5	-	0.012	0.012	**0.265**	0.013
Lead	mg/L	0.005	0.0084	0.01	0.16	<0.00005	<0.00005	<0.00005	<0.00005
Lithium	mg/L	-	-	0.008	-	0.002	0.0019	0.0021	0.0021
Manganese	mg/L	0.02	2.78	1.5	-	**0.536**	**0.49**	**0.547**	**0.656**
Mercury	µg/L	1	0.02	1	0.25	<0.005	<0.005	0.0051	0.0078
Molybdenum	mg/L	-	7.6	0.25	10	0.000204	0.000215	0.000147	0.000164
Nickel	mg/L	-	0.016	0.08	1.50	0.00519	0.00466	0.00545	0.00595
Selenium	mg/L	0.05	0.0020	0.01	0.02	0.000054	0.000115	0.000068	0.000073
Silver	mg/L	-	0.00012	0.02	0.0150	<0.00001	<0.00001	0.000018	<0.00001
Strontium	mg/L	7	-	2.5	-	0.508	0.528	0.515	0.544
Thallium	mg/L	-	-	-	0.003	<0.00001	<0.00001	<0.00001	<0.00001
Tin	mg/L	-	-	2.5	-	<0.0001	0.0001	0.00012	0.00011
Titanium	mg/L	-	-	-	1	<0.0003	<0.0003	<0.0003	<0.0003
Tungsten	mg/L	-	-	0.003	-	0.00057	0.00095	0.00076	0.0005
Uranium	mg/L	0.02	0.0085	0.02	0.085	0.000574	0.000564	0.000608	0.000595
Vanadium	mg/L	-	-	0.02	-	<0.0005	<0.0005	<0.0005	<0.0005
Zinc	mg/L	5	0.082	3	N/A	<0.001	0.0011	0.0012	0.0044
NUTRIENTS									
Nitrate	mg/L as N	10	3	10	400	<0.025	0.0418	<0.025	<0.025
Ammonia Nitrogen	mg/L as N	-	1.84	-	11.3	0.0368	0.042	0.0681	0.0677
POLLUTANT TESTS									
Chemical Oxygen Demand	mg/L as O	-	-	-	-	33	34	<10	31

H:\Project\1005\Analysis\Chemistry\2025\[Tables_B-1 to B-6.xlsx]Table B-5 MW02-3S

NOTES:

Bold denotes parameters which exceed GCDWQ water quality guideline. Underline denotes parameters which exceed BC FWAL guideline. FWAL guideline for arsenic not considered relevant for groundwater. *Italics* denotes parameters which exceed BC CSR DW standard. Yellow highlight denotes parameters which exceed BC CSR AW standard. "-" denotes parameter was not analysed, or a receiving water criteria was not applicable.

1. GCDWQ = Guidelines for Canadian Drinking Water Quality (Health Canada, 2025). Lowest guideline of maximum acceptable concentration or aesthetic objective is shown.
2. Approved and Working Water Quality Guidelines, Science and Information Branch, Environmental Protection Division, BC Ministry of Environment.
   GCDWQ = Guidelines for Canadian Drinking Water Quality (Health Canada, 2025). Lowest guideline of maximum acceptable concentration or aesthetic objective is shown.
   Aquatic life guidelines for cadmium (dissolved), cobalt (dissolved) manganese, silver, and sulphate are based on total hardness, which varies between samples. Guideline for lead (dissolved) varies with hardness and DOC. Guidelines for aluminum and zinc (dissolved) vary with hardness, pH and DOC. Ammonia and sulphate guidelines vary with hardness, temperature, and pH.
   Values are based on average hardness of 495 mg/L, a pH of 7.1, DOC of 7.9 mg/L, and temperature of 10˚ C
3. Per Schedule 3.2 of the Contaminated Sites Regulation (CSR), March 2023. Available: https://www.bclaws.gov.bc.ca/civix/document/id/lc/statreg/375_96_08
   CSR AW standards for cadmium, copper, lead, nickel, silver and zinc are based on total hardness, which varies between samples.
   Likewise, CSR AW ammonia standards vary with pH. Value shown appropriate for hardness of 495 mg/L-CaCO3 and pH of 7.1.
4. Dissolved copper and nickel FWAL guideline was calculated for each site using the average BC BLM software calculations between January 2020 - January 2022 with sample-specific parameters except for humic acid ratio (assumed value of 10).

TABLE B-6

INORGANIC CHEMISTRY DATA FOR MW02-3D (BEDROCK)

SAMPLE DATE		RECEIVING WATER CRITERIA				18-Mar-25	18-Jun-25	16-Sep-25	04-Dec-25
LAB NAME	UNITS	GCDWQ[1]	AQUATIC LIFE (FWAL)[2]	CSR DRINKING WATER (DW)[3]	CSR AQUATIC LIFE (AW)[3]	ALS	ALS	ALS	ALS
PHYSICAL TESTS									
pH-Field	pH	7.0 - 10.5	6.5 - 9.0	-	-	7.17	**6.69**	**6.64**	7.71
pH-Lab	pH	7.0 - 10.5	6.5 - 9.0	-	-	7.75	7.61	7.97	7.48
EC-Field	µS/cm	-	-	-	-	775	500	875	830
EC-Lab	µS/cm	-	-	-	-	1220	1060	1160	1160
Dissolved Hardness ($CaCO_3$)	mg/L	-	-	-	-	477	452	519	559
Total Dissolved Solids	mg/L	500	-	-	-	**748**	**678**	**721**	**666**
Temperature-Field	°C	-	-	-	-	9.8	12.4	13.8	10.8
DISSOLVED ANIONS									
Alkalinity	mg/L $CaCO_3$	-	-	-	-	591	512	540	569
Chloride	mg/L	250	150	250	1500	65.1	58.9	79.1	66.7
Sulphate	mg/L	500	429	500	1280	12.2	13.7	12.1	13.9
DISSOLVED CATIONS									
Calcium	mg/L	-	-	-	-	133	125	144	150
Magnesium	mg/L	-	-	-	-	35.1	33.9	38.7	44.9
Potassium	mg/L	-	-	-	-	2.22	2.21	17	1.96
Sodium	mg/L	200	-	200	-	62.4	57.7	66.7	64.4
DISSOLVED METALS									
Aluminum	mg/L	2.9	0.46	9.5	-	0.0132	0.0022	0.004	<0.001
Antimony	mg/L	0.006	0.074	0.006	0.09	0.00019	0.0002	0.00015	<0.0001
Arsenic	mg/L	0.01	0.005	0.01	0.05	0.00098	0.00173	0.00218	0.00364
Barium	mg/L	2	1	1	10	0.0993	0.0632	0.0767	0.081
Beryllium	mg/L	-	0.00013	0.008	0.0015	<0.0001	<0.0001	<0.0001	<0.0001
Boron	mg/L	5	1.2	5	12	0.733	0.672	0.81	0.778
Cadmium	mg/L	0.007	0.00066	0.005	0.0040	0.000011	0.0000313	0.0000261	0.0000201
Chromium	mg/L	0.05	0.003	0.05	0.01	<0.0005	<0.0005	<0.0005	<0.0005
Cobalt	mg/L	-	0.00096	0.001	0.04	*0.00112*	0.0008	*0.0012*	*0.00137*
Copper	mg/L	1	0.0096	1.5	0.09	0.00343	0.00395	0.00392	0.00281
Iron	mg/L	0.1	0.35	6.5	-	0.013	<0.01	**0.154**	0.014
Lead	mg/L	0.005	0.0090	0.01	0.16	<0.00005	<0.00005	<0.00005	<0.00005
Lithium	mg/L	-	-	0.008	-	*0.0124*	0.0078	*0.0095*	0.0032
Manganese	mg/L	0.02	2.66	1.5	-	***1.63***	**0.783**	**1.12**	**0.747**
Mercury	µg/L	1	0.02	1	0.25	<0.005	<0.005	<0.005	0.005
Molybdenum	mg/L	-	7.6	0.25	10	0.000209	0.000272	0.000294	0.000194
Nickel	mg/L	-	0.016	0.08	1.50	0.00493	0.00453	0.00529	0.00523
Selenium	mg/L	0.05	0.002	0.01	0.02	0.000098	0.000084	0.000068	0.000075
Silver	mg/L	-	0.00012	0.02	0.0150	<0.00001	<0.00001	<0.00001	<0.00001
Strontium	mg/L	7	-	2.5	-	0.72	0.614	0.676	0.628
Thallium	mg/L	-	-	-	0.003	<0.00001	<0.00001	<0.00001	<0.00001
Tin	mg/L	-	-	2.5	-	0.00013	0.00016	0.00015	0.00012
Titanium	mg/L	-	-	-	1	<0.0003	<0.0003	<0.0003	<0.0003
Tungsten	mg/L	-	-	0.003	-	<0.0001	<0.0001	<0.0001	0.00018
Uranium	mg/L	0.02	0.0085	0.02	0.085	0.0005	0.00057	0.000664	0.000641
Vanadium	mg/L	-	-	0.02	-	<0.0005	<0.0005	<0.0005	<0.0005
Zinc	mg/L	5	0.087	3	N/A	<0.001	0.0118	0.0022	0.004
NUTRIENTS									
Nitrate	mg/L as N	10	3	10	400	<0.025	<0.025	<0.025	0.0385
Ammonia Nitrogen	mg/L as N	-	1.84	-	18.4	3.66	0.76	1.18	0.131
POLLUTANT TESTS									
Chemical Oxygen Demand	mg/L as O	-	-	-	-	40	28	46	29

H:\Project\1005\Analysis\Chemistry\2025\[Tables_B-1 to B-6.xlsx]Table B-6 MW02-3D

NOTES:

Bold denotes parameters which exceed GCDWQ water quality guideline. Underline denotes parameters which exceed BC FWAL guideline. FWAL guideline for arsenic not considered relevant for groundwater. *Italics* denotes parameters which exceed BC CSR DW standard. Yellow highlight denotes parameters which exceed BC CSR AW standard. "-" denotes parameter was not analysed, or a receiving water criteria was not applicable.

1. GCDWQ = Guidelines for Canadian Drinking Water Quality (Health Canada, 2025). Lowest guideline of maximum acceptable concentration or aesthetic objective is shown.
2. Approved and Working Water Quality Guidelines, Science and Information Branch, Environmental Protection Division, BC Ministry of Environment.
   GCDWQ = Guidelines for Canadian Drinking Water Quality (Health Canada, 2025). Lowest guideline of maximum acceptable concentration or aesthetic objective is shown.
   Aquatic life guidelines for cadmium (dissolved), cobalt (dissolved) manganese, silver, and sulphate are based on total hardness, which varies between samples. Guideline for lead (dissolved) varies with hardness and DOC. Guidelines for aluminum and zinc (dissolved) vary with hardness, pH and DOC. Ammonia and sulphate guidelines vary with hardness, temperature, and pH.
   Values are based on average hardness of 466 mg/L, a pH of 6.8, DOC of 9.2 mg/L, and temperature of 10° C
3. Per Schedule 3.2 of the Contaminated Sites Regulation (CSR), March 2023. Available: https://www.bclaws.gov.bc.ca/civix/document/id/lc/statreg/375_96_08
   CSR AW standards for cadmium, copper, lead, nickel, silver and zinc are based on total hardness, which varies between samples.
   Likewise, CSR AW ammonia standards vary with pH. Value shown appropriate for hardness of 466 mg/L-CaCO3 and pH of 6.8.
4. Dissolved copper and nickel FWAL guideline was calculated for each site using the average BC BLM software calculations between January 2020 - January 2022 with sample-specific parameters except for humic acid ratio (assumed value of 10).

TABLE B-7

INORGANIC CHEMISTRY DATA FOR MW94-4S (SURFICIAL)

SAMPLE DATE	UNITS	RECEIVING WATER CRITERIA				18-Mar-25	18-Jun-25	17-Sep-25	01-Dec-25
LAB NAME		GCDWQ[1]	AQUATIC LIFE (FWAL)[2]	CSR DRINKING WATER (DW)[3]	CSR AQUATIC LIFE (AW)[3]	ALS	ALS	ALS	
PHYSICAL TESTS									
pH-Field	pH	7.0 - 10.5	6.5 - 9.0	-	-	7.87	9.12	7.94	
pH-Lab	pH	7.0 - 10.5	6.5 - 9.0	-	-	9.23	9.37	9.17	
EC-Field	µS/cm	-	-	-	-	159	223.1	177	NO
EC-Lab	µS/cm	-	-	-	-	248	317	247	ACCESS
Dissolved Hardness ($CaCO_3$)	mg/L	-	-	-	-	4.04	3.67	3.9	
Total Dissolved Solids	mg/L	500	-	-	-	176	218	176	
Temperature-Field	°C	-	-	-	-	8	9.7	11	
DISSOLVED ANIONS									
Alkalinity	mg/L $CaCO_3$	-	-	-	-	120	145	115	
Chloride	mg/L	250	150	250	1500	6.85	23.4	7.88	
Sulphate	mg/L	500	128	500	1280	6.1	6.18	6.16	
DISSOLVED CATIONS									
Calcium	mg/L	-	-	-	-	1.53	1.38	1.46	
Magnesium	mg/L	-	-	-	-	0.0526	0.0555	0.0609	
Potassium	mg/L	-	-	-	-	0.357	15.3	0.401	
Sodium	mg/L	200	-	200	-	58.9	57.9	61.5	
DISSOLVED METALS									
Aluminum	mg/L	2.9	0.60	9.5	-	0.0094	0.0092	0.0273	
Antimony	mg/L	0.006	0.074	0.006	0.09	0.00016	0.00016	0.00019	
Arsenic	mg/L	0.01	0.005	0.01	0.05	0.00528	0.00514	0.00546	
Barium	mg/L	2	1	1	10	0.00377	0.00318	0.00352	
Beryllium	mg/L	-	0.00013	0.008	0.0015	<0.0001	<0.0001	<0.0001	
Boron	mg/L	5	1.2	5	12	1.57	1.44	1.47	
Cadmium	mg/L	0.007	0.000022	0.005	0.0005	<0.000005	<0.000005	<0.000005	
Chromium	mg/L	0.05	0.003	0.05	0.01	<0.0005	<0.0005	<0.0005	
Cobalt	mg/L	-	0.00014	0.001	0.04	<0.0001	<0.0001	<0.0001	
Copper	mg/L	1	0.0067	1.5	0.02	<0.0002	<0.0002	0.00049	
Iron	mg/L	0.1	0.35	6.5	-	<0.01	<0.01	<0.01	
Lead	mg/L	0.005	0.0016	0.01	0.16	<0.00005	<0.00005	<0.00005	
Lithium	mg/L	-	-	0.008	-	*0.01*	*0.0091*	*0.0095*	
Manganese	mg/L	0.02	0.63	1.5	-	0.00072	0.00083	0.00069	
Mercury	µg/L	1	0.02	1	0.25	<0.005	<0.005	<0.005	
Molybdenum	mg/L	-	7.6	0.25	10	0.000466	0.000486	0.0006	
Nickel	mg/L	-	0.00090	0.08	0.25	<0.0005	<0.0005	<0.0005	
Selenium	mg/L	0.05	0.002	0.01	0.02	<0.00005	<0.00005	<0.00005	
Silver	mg/L	-	0.00012	0.02	0.0005	<0.00001	<0.00001	<0.00001	
Strontium	mg/L	7	-	2.5	-	0.0176	0.0173	0.0176	
Thallium	mg/L	-	-	-	0.003	<0.00001	<0.00001	<0.00001	
Tin	mg/L	-	-	2.5	-	<0.0001	<0.0001	<0.0001	
Titanium	mg/L	-	-	-	1	<0.0003	<0.0003	<0.0003	
Tungsten	mg/L	-	-	0.003	-	0.00249	0.00237	0.00183	
Uranium	mg/L	0.02	0.0085	0.02	0.085	<0.00001	0.000016	0.000042	
Vanadium	mg/L	-	-	0.02	-	0.00066	0.00059	0.00081	
Zinc	mg/L	5	0.0019	3	0.075	<0.001	<0.001	<0.001	
NUTRIENTS									
Nitrate	mg/L as N	10	3	10	400	0.0163	0.0094	0.0892	
Ammonia Nitrogen	mg/L as N	-	1.84	-	1.3	0.0748	0.0772	0.0398	
POLLUTANT TESTS									
Chemical Oxygen Demand	mg/L as O	-	-	-	-	<10	<10	56	

H:\Project\1005\Analysis\Chemistry\2025\[Tables_B-7 to B-13.xlsx]Table B-7 MW94-4S

NOTES:

Bold denotes parameters which exceed GCDWQ water quality guideline. Underline denotes parameters which exceed BC FWAL guideline. FWAL guideline for arsenic not considered relevant for groundwater. *Italics* denotes parameters which exceed BC CSR DW standard. Yellow highlight denotes parameters which exceed BC CSR AW standard. "-" denotes parameter was not analysed, or a receiving water criteria was not applicable.

1. GCDWQ = Guidelines for Canadian Drinking Water Quality (Health Canada, 2025). Lowest guideline of maximum acceptable concentration or aesthetic objective is shown.
2. Approved and Working Water Quality Guidelines, Science and Information Branch, Environmental Protection Division, BC Ministry of Environment. Available: https://www2.gov.bc.ca/assets/gov/environment/air-land-water/water/waterquality/water-quality-guidelines/approved-wqgs/wqg_summary_aquaticlife_wildlife_agri.pdf
   Aquatic life guidelines for cadmium (dissolved), cobalt (dissolved), manganese, silver, and sulphate are based on total hardness, which varies between samples. Guideline for lead (dissolved) varies with hardness and DOC. Guidelines for aluminum and zinc (dissolved) vary with hardness, pH and DOC. Ammonia and sulphate guidelines vary with hardness, temperature, and pH.
   Values are based on average hardness of 5 mg/L, a pH of 9.5, DOC of 2.3 mg/L, and temperature of 10˚ C
3. Per Schedule 3.2 of the Contaminated Sites Regulation (CSR), March 2023. Available: https://www.bclaws.gov.bc.ca/civix/document/id/lc/statreg/375_96_08
   CSR AW standards for cadmium, copper, lead, nickel, silver and zinc are based on total hardness, which varies between samples.
   Likewise, CSR AW ammonia standards vary with pH. Value shown appropriate for hardness of 5 mg/L-CaCO3 and pH of 7.9.
4. Dissolved copper and dissolved nickel FWAL guideline ware calculated for each site using the average BC BLM software calculations between January 2020 - January 2022 with sample-specific parameters except for humic acid ratio (assumed value of 10).

TABLE B-8

INORGANIC CHEMISTRY DATA FOR MW94-4D (BEDROCK)

SAMPLE DATE	UNITS	RECEIVING WATER CRITERIA				18-Mar-25	18-Jun-25	17-Sep-25	01-Dec-25
LAB NAME		GCDWQ[1]	AQUATIC LIFE (FWAL)[2]	CSR DRINKING WATER (DW)[3]	CSR AQUATIC LIFE (AW)[3]	ALS	ALS	ALS	
PHYSICAL TESTS									
pH-Field	pH	7.0 - 10.5	6.5 - 9.0	-	-	8.22	8.79	8.07	
pH-Lab	pH	7.0 - 10.5	6.5 - 9.0	-	-	8.43	8.61	8.6	
EC-Field	µS/cm	-	-	-	-	179	248	2475	NO
EC-Lab	µS/cm	-	-	-	-	370	377	358	ACCESS
Total Dissolved Solids	mg/L	500	-	-	-	267	284	302	
Temperature-Field	°C	-	-	-	-	7.7	9.4	10.2	
DISSOLVED ANIONS									
Chloride	mg/L	250	150	250	1500	7.3	5.76	5.59	
Sulphate	mg/L	500	218	500	2180	47.5	36.2	32.7	
NUTRIENTS									
Nitrate	mg/L as N	10	3	10	400	0.727	0.646	0.447	
Ammonia Nitrogen	mg/L as N	-	1.84	-	1.3	<0.005	<0.005	0.0175	

H:\Project\1005\Analysis\Chemistry\2025\[Tables_B-7 to B-13.xlsx]Table B-8 MW94-4D

NOTES:

Bold denotes parameters which exceed GCDWQ water quality guideline. Underline denotes parameters which exceed BC FWAL guideline. FWAL guideline for arsenic not considered relevant for groundwater. *Italics* denotes parameters which exceed BC CSR DW standard. Yellow highlight denotes parameters which exceed BC CSR AW standard. "-" denotes parameter was not analysed, or a receiving water criteria was not applicable.

1. GCDWQ = Guidelines for Canadian Drinking Water Quality (Health Canada, 2024). Lowest guideline of maximum acceptable concentration or aesthetic objective is shown.
2. Approved and Working Water Quality Guidelines, Science and Information Branch, Environmental Protection Division, BC Ministry of Environment. Available: https://www2.gov.bc.ca/gov/content/environment/air-land-water/water/water-quality/water-quality-guidelines/approved-water-quality-guidelines. Guidelines for the Protection of Fresh-Water Aquatic Life ("FWAL"). BC MOE, 2021.
   Aquatic life guidelines for ammonia and sulphate guidelines vary with hardness, temperature, and pH. Values are based on average hardness of 30 mg/L, 10˚ C and a pH of 6.5-7.0.
3. Per Schedule 3.2 of Stage 13 Amendment to Contaminated Sites Regulation (CSR), March 2024. Available: https://www.bclaws.gov.bc.ca/civix/document/id/lc/cgaz2/131-2020_Schedule3.2. CSR AW sulphate and ammonia standards vary with hardness and pH, respectively. Value shown appropriate for hardness of 30 mg/L-CaCO3 and pH of 8.4.

TABLE B-9

INORGANIC CHEMISTRY DATA FOR MW94-5S (BEDROCK)

SAMPLE DATE		RECEIVING WATER CRITERIA				17-Mar-25	17-Jun-25	22-Sep-25	01-Dec-25
LAB NAME	UNITS	GCDWQ[1]	AQUATIC LIFE (FWAL)[2]	CSR DRINKING WATER (DW)[3]	CSR AQUATIC LIFE (AW)[3]	ALS	ALS		ALS
PHYSICAL TESTS									
pH-Field	pH	7.0 - 10.5	6.5 - 9.0	-	-	8.49	**6.66**		7.52
pH-Lab	pH	7.0 - 10.5	6.5 - 9.0	-	-	7.85	7.9		7.73
EC-Field	µS/cm	-	-	-	-	175	177	NOT	454
EC-Lab	µS/cm	-	-	-	-	263	238	SAMPLED	300
Dissolved Hardness ($CaCO_3$)	mg/L	-	-	-	-	128	120		150
Total Dissolved Solids	mg/L	500	-	-	-	186	175		214
Temperature-Field	°C	-	-	-	-	8.6	11.3		11.4
DISSOLVED ANIONS									
Alkalinity	mg/L $CaCO_3$	-	-	-	-	127	118		140
Chloride	mg/L	250	150	250	1500	1.04	1.02		4.54
Sulphate	mg/L	500	309	500	3090	12.6	9.44		16.8
DISSOLVED CATIONS									
Calcium	mg/L	-	-	-	-	40.7	39		49.1
Magnesium	mg/L	-	-	-	-	6.48	5.61		6.72
Potassium	mg/L	-	-	-	-	0.382	0.413		0.525
Sodium	mg/L	200	-	200	-	5.24	4.15		5.35
DISSOLVED METALS									
Aluminum	mg/L	2.9	0.12	9.5	-	0.0023	<0.001		0.0067
Antimony	mg/L	0.006	0.074	0.006	0.09	<0.0001	<0.0001		<0.0001
Arsenic	mg/L	0.01	0.005	0.01	0.05	0.00028	0.00018		0.00017
Barium	mg/L	2	1	1	10	0.0202	0.017		0.0212
Beryllium	mg/L	-	0.00013	0.008	0.0015	<0.0001	<0.0001		<0.0001
Boron	mg/L	5	1.2	5	12	0.346	0.32		0.326
Cadmium	mg/L	0.007	0.00026	0.005	0.0025	0.0000058	0.0000067		0.0000062
Chromium	mg/L	0.05	0.003	0.05	0.01	<0.0005	<0.0005		<0.0005
Cobalt	mg/L	-	0.00057	0.001	0.04	<0.0001	<0.0001		<0.0001
Copper	mg/L	1	0.00098	1.5	0.06	<u>0.00174</u>	0.00058		0.00063
Iron	mg/L	0.1	0.35	6.5	-	<0.01	<0.01		0.088
Lead	mg/L	0.005	0.0031	0.01	0.16	<0.00005	<0.00005		<0.00005
Lithium	mg/L	-	-	0.008	-	<0.001	<0.001		<0.001
Manganese	mg/L	0.02	1.19	1.5	-	<0.0001	0.00194		**0.0305**
Mercury	µg/L	1	0.02	1	0.25	<0.005	<0.005		<0.005
Molybdenum	mg/L	-	7.6	0.25	10	0.00063	0.000451		0.00037
Nickel	mg/L	-	0.0042	0.08	1.10	<0.0005	<0.0005		<0.0005
Selenium	mg/L	0.05	0.002	0.01	0.02	0.000653	0.0005		0.000742
Silver	mg/L	-	0.00012	0.02	0.0150	<0.00001	<0.00001		<0.00001
Strontium	mg/L	7	-	2.5	-	0.197	0.177		0.232
Thallium	mg/L	-	-	-	0.003	<0.00001	<0.00001		<0.00001
Tin	mg/L	-	-	2.5	-	<0.0001	<0.0001		<0.0001
Titanium	mg/L	-	-	-	1	<0.0003	<0.0003		<0.0003
Tungsten	mg/L	-	-	0.003	-	<0.0001	<0.0001		<0.0001
Uranium	mg/L	0.02	0.0085	0.02	0.085	0.000141	0.00008		0.000087
Vanadium	mg/L	-	-	0.02	-	<0.0005	<0.0005		<0.0005
Zinc	mg/L	5	0.019	3	0.900	0.0019	0.0019		0.0034
NUTRIENTS									
Nitrate	mg/L as N	10	3	10	400	0.253	0.144		0.554
Ammonia Nitrogen	mg/L as N	-	1.84	-	11.3	<0.005	<0.005		0.0511
POLLUTANT TESTS									
Chemical Oxygen Demand	mg/L as O	-	-	-	-	12	<10		<10

H:\Project\1005\Analysis\Chemistry\2025\[Tables_B-7 to B-13.xlsx]Table B-9 MW94-5S

NOTES:

Bold denotes parameters which exceed GCDWQ water quality guideline. <u>Underline</u> denotes parameters which exceed BC FWAL guideline. FWAL guideline for arsenic not considered relevant for groundwater. *Italics* denotes parameters which exceed BC CSR DW standard. Yellow highlight denotes parameters which exceed BC CSR AW standard. "-" denotes parameter was not analysed, or a receiving water criteria was not applicable.

1. GCDWQ = Guidelines for Canadian Drinking Water Quality (Health Canada, 2025). Lowest guideline of maximum acceptable concentration or aesthetic objective is shown.
2. Approved and Working Water Quality Guidelines, Science and Information Branch, Environmental Protection Division, BC Ministry of Environment. Available: https://www2.gov.bc.ca/assets/gov/environment/air-land-water/water/waterquality/water-quality-guidelines/approved-wqgs/wqg_summary_aquaticlife_wildlife_agri.pdf
   Aquatic life guidelines for cadmium (dissolved), cobalt (dissolved), manganese, silver, and sulphate are based on total hardness, which varies between samples. Guideline for lead (dissolved) varies with hardness and DOC. Guidelines for aluminum and zinc (dissolved) vary with hardness, pH and DOC. Ammonia and sulphate guidelines vary with hardness, temperature, and pH.
   Values are based on average hardness of 132 mg/L, a pH of 7.2, DOC of 1.9 mg/L, and temperature of 10˚ C
3. Per Schedule 3.2 of the Contaminated Sites Regulation (CSR), March 2023. Available: https://www.bclaws.gov.bc.ca/civix/document/id/lc/statreg/375_96_08
   CSR AW standards for cadmium, copper, lead, nickel, silver and zinc are based on total hardness, which varies between samples.
   Likewise, CSR AW ammonia standards vary with pH. Value shown appropriate for hardness of 132 mg/L-CaCO3 and pH of 7.6.
4. Dissolved copper and dissolved nickel FWAL guideline ware calculated for each site using the average BC BLM software calculations between January 2020 - January 2022 with sample-specific parameters except for humic acid ratio (assumed value of 10).

TABLE B-10

INORGANIC CHEMISTRY DATA FOR MW94-6S (SURFICIAL)

SAMPLE DATE		RECEIVING WATER CRITERIA				17-Mar-25	16-Jun-25	22-Sep-25	04-Dec-25
LAB NAME	UNITS	GCDWQ[1]	AQUATIC LIFE (FWAL)[2]	CSR DRINKING WATER (DW)[3]	CSR AQUATIC LIFE (AW)[3]	ALS	ALS	ALS	ALS
PHYSICAL TESTS									
pH-Field	pH	7.0 - 10.5	6.5 - 9.0	-	-	7.52	8.65	**6.92**	7.3
pH-Lab	pH	7.0 - 10.5	6.5 - 9.0	-	-	**6.47**	7.5	**6.59**	**6.51**
EC-Field	µS/cm	-	-	-	-	363	529	533	223
EC-Lab	µS/cm	-	-	-	-	436	606	593	504
Dissolved Hardness ($CaCO_3$)	mg/L	-	-	-	-	69.8	253	243	208
Total Dissolved Solids	mg/L	500	-	-	-	282	372	310	289
Temperature-Field	°C	-	-	-	-	9	10.3	12.3	12
DISSOLVED ANIONS									
Alkalinity	mg/L $CaCO_3$	-	-	-	-	230	322	302	276
Chloride	mg/L	250	150	250	1500	5.68	8.11	13.7	6.78
Sulphate	mg/L	500	429	500	4290	<0.3	<0.3	<0.3	<0.3
DISSOLVED CATIONS									
Calcium	mg/L	-	-	-	-	22.9	86.1	80.4	68.8
Magnesium	mg/L	-	-	-	-	3.06	9.33	10.3	8.9
Potassium	mg/L	-	-	-	-	2.33	6.54	7.78	7.15
Sodium	mg/L	200	-	200	-	84.4	12.8	10.2	9.67
DISSOLVED METALS									
Aluminum	mg/L	2.9	0.24	9.5	-	0.0034	<0.001	0.0026	0.0015
Antimony	mg/L	0.006	0.074	0.006	0.09	0.00024	<0.0001	<0.0001	<0.0001
Arsenic	mg/L	0.01	0.005	0.01	0.05	0.00057	0.00031	0.00031	0.00056
Barium	mg/L	2	1	1	10	0.0148	0.0227	0.0153	0.017
Beryllium	mg/L	-	0.00013	0.008	0.0015	<0.0001	<0.0001	<0.0001	<0.0001
Boron	mg/L	5	1.2	5	12	1.03	0.248	0.274	0.304
Cadmium	mg/L	0.007	0.00040	0.005	0.0040	0.0000699	0.0000838	<0.000005	2.9E-05
Chromium	mg/L	0.05	0.003	0.05	0.01	<0.0005	<0.0005	<0.0005	<0.0005
Cobalt	mg/L	-	0.00073	0.001	0.04	0.00055	0.00077	*0.00118*	0.00077
Copper	mg/L	1	0.0033	1.5	0.09	0.00163	0.00108	<0.0002	0.00028
Iron	mg/L	0.1	0.35	6.5	-	0.01	<0.01	**3.29**	**5.84**
Lead	mg/L	0.005	0.0065	0.01	0.16	<0.00005	<0.00005	<0.00005	<0.00005
Lithium	mg/L	-	-	0.008	-	*0.0124*	<0.001	<0.001	<0.001
Manganese	mg/L	0.02	1.64	1.5	-	**1.28**	***4.76***	***4.88***	***4.26***
Mercury	µg/L	1	0.02	1	0.25	<0.005	<0.005	<0.005	<0.005
Molybdenum	mg/L	-	7.6	0.25	10	0.00261	0.00012	0.00011	0.000108
Nickel	mg/L	-	0.0083	0.08	1.50	0.00126	0.0011	0.00162	0.0010
Selenium	mg/L	0.05	0.002	0.01	0.02	0.000068	<0.00005	0.000052	<0.00005
Silver	mg/L	-	0.00012	0.02	0.0150	<0.00001	<0.00001	<0.00001	<0.00001
Strontium	mg/L	7	-	2.5	-	0.13	0.329	0.328	0.286
Thallium	mg/L	-	-	-	0.003	0.000014	<0.00001	<0.00001	<0.00001
Tin	mg/L	-	-	2.5	-	<0.0001	<0.0001	<0.0001	<0.0001
Titanium	mg/L	-	-	-	1	0.00054	<0.0003	<0.0003	<0.0003
Tungsten	mg/L	-	-	0.003	-	0.00012	<0.0001	<0.0001	<0.0001
Uranium	mg/L	0.02	0.0085	0.02	0.085	0.0011	0.000067	0.00002	0.000014
Vanadium	mg/L	-	-	0.02	-	<0.0005	<0.0005	<0.0005	<0.0005
Zinc	mg/L	5	0.086	3	1.650	0.0027	0.0032	0.0085	0.003
NUTRIENTS									
Nitrate	mg/L as N	10	3	10	400	<0.005	0.0106	<0.005	0.008
Ammonia Nitrogen	mg/L as N	-	1.84	-	18.4	6.86	7.84	8.38	8.1
POLLUTANT TESTS									
Chemical Oxygen Demand	mg/L as O	-	-	-	-	53	47	43	38

H:\Project\1005\Analysis\Chemistry\2025\[Tables_B-7 to B-13.xlsx]Table B-10 MW94-6S

NOTES:

Bold denotes parameters which exceed GCDWQ water quality guideline. Underline denotes parameters which exceed BC FWAL guideline. FWAL guideline for arsenic not considered relevant for groundwater. *Italics* denotes parameters which exceed BC CSR DW standard. Yellow highlight denotes parameters which exceed BC CSR AW standard. "-" denotes parameter was not analysed, or a receiving water criteria was not applicable.

1. GCDWQ = Guidelines for Canadian Drinking Water Quality (Health Canada, 2025). Lowest guideline of maximum acceptable concentration or aesthetic objective is shown.
2. Approved and Working Water Quality Guidelines, Science and Information Branch, Environmental Protection Division, BC Ministry of Environment. Available: https://www2.gov.bc.ca/assets/gov/environment/air-land-water/water/waterquality/water-quality-guidelines/approved-wqgs/wqg_summary_aquaticlife_wildlife_agri.pdf
   Aquatic life guidelines for cadmium (dissolved), cobalt (dissolved), manganese, silver, and sulphate are based on total hardness, which varies between samples. Guideline for lead (dissolved) varies with hardness and DOC. Guidelines for aluminum and zinc (dissolved) vary with hardness, pH and DOC. Ammonia and sulphate guidelines vary with hardness, temperature, and pH.
   Values are based on average hardness of 235 mg/L, a pH of 6.6, DOC of 6.6 mg/L, and temperature of 10˚ C
3. Per Schedule 3.2 of the Contaminated Sites Regulation (CSR), March 2023. Available: https://www.bclaws.gov.bc.ca/civix/document/id/lc/statreg/375_96_08
   CSR AW standards for cadmium, copper, lead, nickel, silver and zinc are based on total hardness, which varies between samples.
   Likewise, CSR AW ammonia standards vary with pH. Value shown appropriate for hardness of 235 mg/L-CaCO3 and pH of 7.6.
4. Dissolved copper and dissolved nickel FWAL guideline ware calculated for each site using the average BC BLM software calculations between January 2020 - January 2022 with sample-specific parameters except for humic acid ratio (assumed value of 10).
5. Based on chemistry results compared to previous years, it appears that sample labels for MW94-6S and MW94-6D were mixed up for the June sample. These have been reassigned sample IDs based on their chemistry.

TABLE B-11

INORGANIC CHEMISTRY DATA FOR MW94-6D (BEDROCK)

SAMPLE DATE		RECEIVING WATER CRITERIA				17-Mar-25	16-Jun-25	22-Sep-25	04-Dec-25
LAB NAME	UNITS	GCDWQ[1]	AQUATIC LIFE (FWAL)[2]	CSR DRINKING WATER (DW)[3]	CSR AQUATIC LIFE (AW)[3]	ALS	ALS	ALS	ALS
PHYSICAL TESTS									
pH-Field	pH	7.0 - 10.5	6.5 - 9.0	-	-	9.81	8.45	**10.8**	7.26
pH-Lab	pH	7.0 - 10.5	6.5 - 9.0	-	-	9.63	9.51	9.65	9.63
EC-Field	µS/cm	-	-	-	-	371	384	533	356
EC-Lab	µS/cm	-	-	-	-	538	530	533	521
Dissolved Hardness ($CaCO_3$)	mg/L	-	-	-	-	1.85	1.79	1.57	<0.6
Total Dissolved Solids	mg/L	500	-	-	-	475	**624**	**819**	**528**
Temperature-Field	°C	-	-	-	-	9.1	12.6	12.7	9.6
DISSOLVED ANIONS									
Alkalinity	mg/L $CaCO_3$	-	-	-	-	257	235	231	236
Chloride	mg/L	250	150	250	1500	6.61	7.81	7.08	7.18
Sulphate	mg/L	500	128	500	1280	31.8	28.6	26.3	26.9
DISSOLVED CATIONS									
Calcium	mg/L	-	-	-	-	0.55	0.647	0.549	<0.5
Magnesium	mg/L	-	-	-	-	0.115	0.0417	0.0492	0.0601
Potassium	mg/L	-	-	-	-	0.699	0.955	0.588	0.514
Sodium	mg/L	200	-	200	-	129	129	116	126
DISSOLVED METALS									
Aluminum	mg/L	2.9	0.85	9.5	-	0.476	0.0089	0.103	0.341
Antimony	mg/L	0.006	0.074	0.006	0.09	0.0007	0.00068	0.00053	<0.001
Arsenic	mg/L	0.01	0.005	0.01	0.05	***0.0178***	***0.0154***	***0.0142***	***0.0155***
Barium	mg/L	2	1	1	10	0.00192	0.00146	0.00125	<0.001
Beryllium	mg/L	-	0.00013	0.008	0.0015	<0.0001	<0.0001	<0.0001	<0.0002
Boron	mg/L	5	1.2	5	12	2.18	1.95	2.02	2.3
Cadmium	mg/L	0.007	0.000028	0.005	0.0005	0.0000254	0.0000289	0.0000283	<0.00005
Chromium	mg/L	0.05	0.003	0.05	0.01	<0.001	<0.0005	<0.001	<0.005
Cobalt	mg/L	-	0.00016	0.001	0.04	<0.0002	<0.0001	<0.0002	<0.001
Copper	mg/L	1	0.014	1.5	0.02	0.00382	0.00349	0.00206	<0.002
Iron	mg/L	0.1	0.35	6.5	-	**0.184**	0.028	0.065	**0.129**
Lead	mg/L	0.005	0.0023	0.01	0.16	0.000798	0.000539	0.000583	0.000702
Lithium	mg/L	-	-	0.008	-	*0.0193*	*0.0214*	*0.0182*	*0.0214*
Manganese	mg/L	0.02	0.63	1.5	-	0.00344	0.00104	0.0018	0.00218
Mercury	µg/L	1	0.02	1	0.25	0.0185	0.0296	0.0347	0.0314
Molybdenum	mg/L	-	7.6	0.25	10	0.00758	0.00623	0.0062	0.0065
Nickel	mg/L	-	0.0013	0.08	0.25	0.00116	0.001	<0.001	<0.005
Selenium	mg/L	0.05	0.002	0.01	0.02	0.000106	0.000128	0.000108	<0.0005
Silver	mg/L	-	0.00012	0.02	0.0005	0.000025	0.000024	0.000026	<0.0001
Strontium	mg/L	7	-	2.5	-	0.00595	0.00873	0.00562	0.00301
Thallium	mg/L	-	-	-	0.003	<0.00002	<0.00001	<0.00002	<0.0001
Tin	mg/L	-	-	2.5	-	<0.0002	<0.0001	<0.0002	<0.001
Titanium	mg/L	-	-	-	1	0.00975	0.00172	0.00361	0.00801
Tungsten	mg/L	-	-	0.003	-	*0.0082*	*0.00736*	*0.00768*	*0.00802*
Uranium	mg/L	0.02	0.0085	0.02	0.085	0.00246	0.00174	0.00179	0.00191
Vanadium	mg/L	-	-	0.02	-	0.00968	0.00629	0.00659	0.00665
Zinc	mg/L	5	0.0023	3	0.075	<0.002	<0.001	<0.002	<0.01
NUTRIENTS									
Nitrate	mg/L as N	10	3	10	400	0.273	1.57	1.11	1
Ammonia Nitrogen	mg/L as N	-	1.84	-	1.3	0.232	0.0223	0.0996	0.0254
POLLUTANT TESTS									
Chemical Oxygen Demand	mg/L as O	-	-	-	-	236	49	44	35
Total Organic Carbon	mg/L as O	-	-	-	-	83.6	-	12.3	12.7

H:\Project\1005\Analysis\Chemistry\2025\[Tables_B-7 to B-13.xlsx]Table B-11 MW94-6D

NOTES:

Bold denotes parameters which exceed GCDWQ water quality guideline. Underline denotes parameters which exceed BC FWAL guideline. FWAL guideline for arsenic not considered relevant for groundwater. *Italics* denotes parameters which exceed BC CSR DW standard. Yellow highlight denotes parameters which exceed BC CSR AW standard. "-" denotes parameter was not analysed, or a receiving water criteria was not applicable.

1. GCDWQ = Guidelines for Canadian Drinking Water Quality (Health Canada, 2025). Lowest guideline of maximum acceptable concentration or aesthetic objective is shown.
2. Approved and Working Water Quality Guidelines, Science and Information Branch, Environmental Protection Division, BC Ministry of Environment. Available: https://www2.gov.bc.ca/assets/gov/environment/air-land-water/water/waterquality/water-quality-guidelines/approved-wqgs/wqg_summary_aquaticlife_wildlife_agri.pdf
   Aquatic life guidelines for cadmium (dissolved), cobalt (dissolved), manganese, silver, and sulphate are based on total hardness, which varies between samples. Guideline for lead (dissolved) varies with hardness and DOC. Guidelines for aluminum and zinc (dissolved) vary with hardness, pH and DOC. Ammonia and sulphate guidelines vary with hardness, temperature, and pH.
   Values are based on average hardness of 6 mg/L, a pH of 9, DOC of 3.9 mg/L, and temperature of 10˚ C
3. Per Schedule 3.2 of the Contaminated Sites Regulation (CSR), March 2023. Available: https://www.bclaws.gov.bc.ca/civix/document/id/lc/statreg/375_96_08
   CSR AW standards for cadmium, copper, lead, nickel, silver and zinc are based on total hardness, which varies between samples.
   Likewise, CSR AW ammonia standards vary with pH. Value shown appropriate for hardness of 6 mg/L-CaCO3 and pH of 9.1.
4. Dissolved copper and dissolved nickel FWAL guideline ware calculated for each site using the average BC BLM software calculations between January 2020 - January 2022 with sample-specific parameters except for humic acid ratio (assumed value of 10).
5. Based on chemistry results compared to previous years, it appears that sample labels for MW94-6S and MW94-6D were mixed up for the June sample. These have been reassigned sample IDs based on their chemistry.

TABLE B-12

INORGANIC CHEMISTRY DATA FOR MW98-9 (SURFICIAL)

SAMPLE DATE	UNITS	RECEIVING WATER CRITERIA				17-Mar-25	16-Jun-25	22-Sep-25	04-Dec-25
LAB NAME		GCDWQ[1]	AQUATIC LIFE (FWAL)[2]	CSR DRINKING WATER (DW)[3]	CSR AQUATIC LIFE (AW)[3]	ALS		ALS	ALS
PHYSICAL TESTS									
pH-Field	pH	7.0 - 10.5	6.5 - 9.0	-	-	7.65		7.09	**6.28**
pH-Lab	pH	7.0 - 10.5	6.5 - 9.0	-	-	**6.55**		**6.52**	7.29
EC-Field	µS/cm	-	-	-	-	63.7	DRY	841	383.9
EC-Lab	µS/cm	-	-	-	-	87		1330	533
Dissolved Hardness ($CaCO_3$)	mg/L	-	-	-	-	39.9		582	244
Total Dissolved Solids	mg/L	500	-	-	-	81		**901**	317
Temperature-Field	°C	-	-	-	-	9.1		12.7	11.9
DISSOLVED ANIONS									
Alkalinity	mg/L $CaCO_3$	-	-	-	-	44.5		443	246
Chloride	mg/L	250	150	250	1500	1.08		178	30.6
Sulphate	mg/L	500	309	500	3090	0.71		<1.5	2.56
DISSOLVED CATIONS									
Calcium	mg/L	-	-	-	-	9.71		149	63.1
Magnesium	mg/L	-	-	-	-	3.8		51	20.9
Potassium	mg/L	-	-	-	-	0.084		0.744	0.731
Sodium	mg/L	200	-	200	-	3.08		50.6	21.3
DISSOLVED METALS									
Aluminum	mg/L	2.9	0.077	9.5	-	0.0048		0.0013	<0.001
Antimony	mg/L	0.006	0.074	0.006	0.09	<0.0001		0.00012	<0.0001
Arsenic	mg/L	0.01	0.005	0.01	0.05	0.00032		0.00068	0.00066
Barium	mg/L	2	1	1	10	0.00284		0.0234	0.01
Beryllium	mg/L	-	0.00013	0.008	0.0015	<0.0001		<0.0001	<0.0001
Boron	mg/L	5	1.2	5	12	<0.01		0.295	0.167
Cadmium	mg/L	0.007	0.00019	0.005	0.0015	<0.000005		0.0000365	0.0000276
Chromium	mg/L	0.05	0.003	0.05	0.01	0.00121		<0.0005	0.00054
Cobalt	mg/L	-	0.00048	0.001	0.04	<0.0001		0.00023	0.00017
Copper	mg/L	1	0.00024	1.5	0.04	0.001		0.0106	0.00506
Iron	mg/L	0.1	0.35	6.5	-	<0.01		0.016	<0.01
Lead	mg/L	0.005	0.0025	0.01	0.16	<0.00005		0.000544	0.0002
Lithium	mg/L	-	-	0.008	-	<0.001		0.0014	0.001
Manganese	mg/L	0.02	0.99	1.5	-	0.00089		**0.0228**	**0.0381**
Mercury	µg/L	1	0.02	1	0.25	<0.005		0.0278	0.0084
Molybdenum	mg/L	-	7.6	0.25	10	0.000255		0.000078	0.000179
Nickel	mg/L	-	0.0026	0.08	0.65	<0.0005		0.00687	0.00201
Selenium	mg/L	0.05	0.002	0.01	0.02	0.000079		0.00019	0.000453
Silver	mg/L	-	0.00012	0.02	0.0005	<0.00001		<0.00001	<0.00001
Strontium	mg/L	7	-	2.5	-	0.0193		0.335	0.137
Thallium	mg/L	-	-	-	0.003	<0.00001		<0.00001	<0.00001
Tin	mg/L	-	-	2.5	-	<0.0001		0.0002	<0.0001
Titanium	mg/L	-	-	-	1	0.00038		<0.0003	<0.0003
Tungsten	mg/L	-	-	0.003	-	<0.0001		<0.0001	<0.0001
Uranium	mg/L	0.02	0.0085	0.02	0.085	0.000016		0.00112	0.000371
Vanadium	mg/L	-	-	0.02	-	0.00133		0.00191	0.00279
Zinc	mg/L	5	0.016	3	0.075	0.0029		0.0445	0.0031
NUTRIENTS									
Nitrate	mg/L as N	10	3	10	400	0.14		<0.025	0.295
Ammonia Nitrogen	mg/L as N	-	1.84	-	18.4	<0.005		0.0189	0.848
POLLUTANT TESTS									
Chemical Oxygen Demand	mg/L as O	-	-	-	-	12		57	28

H:\Project\1005\Analysis\Chemistry\2025\[Tables_B-7 to B-13.xlsx]Table B-12 MW98-9

NOTES:

Bold denotes parameters which exceed GCDWQ water quality guideline. Underline denotes parameters which exceed BC FWAL guideline. FWAL guideline for arsenic not considered relevant for groundwater. *Italics* denotes parameters which exceed BC CSR DW standard. Yellow highlight denotes parameters which exceed BC CSR AW standard. "-" denotes parameter was not analysed, or a receiving water criteria was not applicable.

1. GCDWQ = Guidelines for Canadian Drinking Water Quality (Health Canada, 2025). Lowest guideline of maximum acceptable concentration or aesthetic objective is shown.
2. Approved and Working Water Quality Guidelines, Science and Information Branch, Environmental Protection Division, BC Ministry of Environment. Available: https://www2.gov.bc.ca/assets/gov/environment/air-land-water/water/waterquality/water-quality-guidelines/approved-wqgs/wqg_summary_aquaticlife_wildlife_agri.pdf
   Aquatic life guidelines for cadmium (dissolved), cobalt (dissolved), manganese, silver, and sulphate are based on total hardness, which varies between samples. Guideline for lead (dissolved) varies with hardness and DOC. Guidelines for aluminum and zinc (dissolved) vary with hardness, pH and DOC. Ammonia and sulphate guidelines vary with hardness, temperature, and pH.
   Values are based on average hardness of 87 mg/L, a pH of 6.9, DOC of 1.6 mg/L, and temperature of 10˚ C
3. Per Schedule 3.2 of the Contaminated Sites Regulation (CSR), March 2023. Available: https://www.bclaws.gov.bc.ca/civix/document/id/lc/statreg/375_96_08
   CSR AW standards for cadmium, copper, lead, nickel, silver and zinc are based on total hardness, which varies between samples.
   Likewise, CSR AW ammonia standards vary with pH. Value shown appropriate for hardness of 87 mg/L-CaCO3 and pH of 7.
4. Dissolved copper and dissolved nickel FWAL guideline ware calculated for each site using the average BC BLM software calculations between January 2020 - January 2022 with sample-specific parameters except for humic acid ratio (assumed value of 10).

TABLE B-13

INORGANIC CHEMISTRY DATA FOR MW98-10 (SURFICIAL)

SAMPLE DATE		RECEIVING WATER CRITERIA				17-Mar-25	16-Jun-25	22-Sep-25	04-Dec-25
LAB NAME	UNITS	GCDWQ[1]	AQUATIC LIFE (FWAL)[2]	CSR DRINKING WATER (DW)[3]	CSR AQUATIC LIFE (AW)[3]	ALS		ALS	ALS
PHYSICAL TESTS									
pH-Field	pH	7.0 - 10.5	6.5 - 9.0	-	-	7.31		**6.72**	**6.1**
pH-Lab	pH	7.0 - 10.5	6.5 - 9.0	-	-	**6.32**		**6.74**	**6.55**
EC-Field	µS/cm	-	-	-	-	20	DRY	111.4	36.1
EC-Lab	µS/cm	-	-	-	-	31.5		122	46.7
Dissolved Hardness ($CaCO_3$)	mg/L	-	-	-	-	11.2		38.2	15.1
Total Dissolved Solids	mg/L	500	-	-	-	33		72	40
Temperature-Field	°C	-	-	-	-	7.3		14	9.9
DISSOLVED ANIONS									
Alkalinity	mg/L $CaCO_3$	-	-	-	-	12.2		58.7	15.4
Chloride	mg/L	250	150	250	1500	<0.5		1	2.76
Sulphate	mg/L	500	128	500	1280	1.33		1.66	1.91
DISSOLVED CATIONS									
Calcium	mg/L	-	-	-	-	3.12		10.5	4.23
Magnesium	mg/L	-	-	-	-	0.83		2.91	1.1
Potassium	mg/L	-	-	-	-	0.178		0.501	1.21
Sodium	mg/L	200	-	200	-	1.65		5.31	2.68
DISSOLVED METALS									
Aluminum	mg/L	2.9	0.041	9.5	-	0.021		<0.001	0.0058
Antimony	mg/L	0.006	0.074	0.006	0.09	<0.0001		<0.0001	0.0002
Arsenic	mg/L	0.01	0.005	0.01	0.05	<0.0001		0.00018	<0.0001
Barium	mg/L	2	1	1	10	0.00089		0.00351	0.00137
Beryllium	mg/L	-	0.00013	0.008	0.0015	<0.0001		<0.0001	<0.0001
Boron	mg/L	5	1.2	5	12	0.011		0.036	0.017
Cadmium	mg/L	0.007	0.000080	0.005	0.0005	0.0000098		0.0000068	0.0000154
Chromium	mg/L	0.05	0.003	0.05	0.01	<0.0005		<0.0005	0.00052
Cobalt	mg/L	-	0.00030	0.001	0.04	<0.0001		*0.00198*	<0.0001
Copper	mg/L	1	0.00022	1.5	0.02	0.00054		<0.0002	0.00077
Iron	mg/L	0.1	0.35	6.5	-	<0.01		**0.225**	0.027
Lead	mg/L	0.005	0.0021	0.01	0.16	<0.00005		<0.00005	<0.00005
Lithium	mg/L	-	-	0.008	-	<0.001		<0.001	<0.001
Manganese	mg/L	0.02	0.72	1.5	-	0.0018		**0.332**	0.00483
Mercury	µg/L	1	0.02	1	0.25	<0.005		<0.005	<0.005
Molybdenum	mg/L	-	7.6	0.25	10	<0.00005		0.000387	<0.00005
Nickel	mg/L	-	0.0010	0.08	0.25	<0.0005		0.00103	<0.0005
Selenium	mg/L	0.05	0.002	0.01	0.02	<0.00005		<0.00005	<0.00005
Silver	mg/L	-	0.00012	0.02	0.0005	<0.00001		<0.00001	<0.00001
Strontium	mg/L	7	-	2.5	-	0.00934		0.0217	0.0108
Thallium	mg/L	-	-	-	0.003	<0.00001		<0.00001	<0.00001
Tin	mg/L	-	-	2.5	-	<0.0001		<0.0001	<0.0001
Titanium	mg/L	-	-	-	1	0.00151		<0.0003	0.0004
Tungsten	mg/L	-	-	0.003	-	<0.0001		<0.0001	<0.0001
Uranium	mg/L	0.02	0.0085	0.02	0.085	<0.00001		<0.00001	<0.00001
Vanadium	mg/L	-	-	0.02	-	0.00052		<0.0005	0.00095
Zinc	mg/L	5	0.0071	3	0.075	0.0018		<0.001	0.0155
NUTRIENTS									
Nitrate	mg/L as N	10	3	10	400	0.165		0.166	0.334
Ammonia Nitrogen	mg/L as N	-	1.84	-	18.4	<0.005		2.66	0.0147
POLLUTANT TESTS									
Chemical Oxygen Demand	mg/L as O	-	-	-	-	<10		18	<10

H:\Project\1005\Analysis\Chemistry\2025\[Tables_B-7 to B-13.xlsx]Table B-13 MW98-10

NOTES:

Bold denotes parameters which exceed GCDWQ water quality guideline. Underline denotes parameters which exceed BC FWAL guideline. FWAL guideline for arsenic not considered relevant for groundwater. *Italics* denotes parameters which exceed BC CSR DW standard. Yellow highlight denotes parameters which exceed BC CSR AW standard. "-" denotes parameter was not analysed, or a receiving water criteria was not applicable.

1. GCDWQ = Guidelines for Canadian Drinking Water Quality (Health Canada, 2025). Lowest guideline of maximum acceptable concentration or aesthetic objective is shown.
2. Approved and Working Water Quality Guidelines, Science and Information Branch, Environmental Protection Division, BC Ministry of Environment. Available: https://www2.gov.bc.ca/assets/gov/environment/air-land-water/water/waterquality/water-quality-guidelines/approved-wqgs/wqg_summary_aquaticlife_wildlife_agri.pdf
   Aquatic life guidelines for cadmium (dissolved), cobalt (dissolved), manganese, silver, and sulphate are based on total hardness, which varies between samples. Guideline for lead (dissolved) varies with hardness and DOC. Guidelines for aluminum and zinc (dissolved) vary with hardness, pH and DOC. Ammonia and sulphate guidelines vary with hardness, temperature, and pH.
   Values are based on average hardness of 27 mg/L, a pH of 6.5, DOC of 1.8 mg/L, and temperature of 10˚ C
3. Per Schedule 3.2 of the Contaminated Sites Regulation (CSR), March 2023. Available: https://www.bclaws.gov.bc.ca/civix/document/id/lc/statreg/375_96_08
   CSR AW standards for cadmium, copper, lead, nickel, silver and zinc are based on total hardness, which varies between samples.
   Likewise, CSR AW ammonia standards vary with pH. Value shown appropriate for hardness of 27 mg/L-CaCO3 and pH of 7.
4. Dissolved copper and dissolved nickel FWAL guideline ware calculated for each site using the average BC BLM software calculations between January 2020 - January 2022 with sample-specific parameters except for humic acid ratio (assumed value of 10).

TABLE B-14

INORGANIC CHEMISTRY DATA FOR MW02-1D (BACKGROUND BEDROCK)

SAMPLE DATE	UNITS	RECEIVING WATER CRITERIA				17-Mar-25	17-Jun-25	17-Sep-25	02-Dec-25
LAB NAME		GCDWQ[1]	AQUATIC LIFE (FWAL)[2]	CSR DRINKING WATER (DW)[3]	CSR AQUATIC LIFE (AW)[3]	ALS	ALS	ALS	ALS
PHYSICAL TESTS									
pH-Field	pH	7.0 - 10.5	6.5 - 9.0	-	-	8.07	7.19	8.44	8.45
pH-Lab	pH	7.0 - 10.5	6.5 - 9.0	-	-	9.62	9.58	9.54	9.67
EC-Field	µS/cm	-	-	-	-	213	233	2	220
EC-Lab	µS/cm	-	-	-	-	320	322	323	326
Dissolved Hardness ($CaCO_3$)	mg/L	-	-	-	-	1.48	1.51	2.15	1.54
Total Dissolved Solids	mg/L	500	-	-	-	244	233	235	250
Temperature-Field	°C	-	-	-	-	8.1	10.6	11.2	8.8
DISSOLVED ANIONS									
Alkalinity	mg/L $CaCO_3$	-	-	-	-	158	161	156	157
Chloride	mg/L	250	150	250	1500	6.94	6.75	9.11	7.16
Sulphate	mg/L	500	128	500	1280	5.07	4.89	6.04	5.12
DISSOLVED CATIONS									
Calcium	mg/L	-	-	-	-	0.544	0.54	0.722	0.574
Magnesium	mg/L	-	-	-	-	0.0288	0.0394	0.0834	0.0248
Potassium	mg/L	-	-	-	-	0.316	0.405	0.409	0.503
Sodium	mg/L	200	-	200	-	78.2	75.7	78.8	72
DISSOLVED METALS									
Aluminum	mg/L	2.9	0.31	9.5	-	0.0179	0.0444	0.0306	0.0096
Antimony	mg/L	0.006	0.074	0.006	0.09	<0.0002	<0.0002	<0.0002	<0.0002
Arsenic	mg/L	0.01	0.005	0.01	0.05	***0.0162***	***0.0165***	***0.0151***	***0.0159***
Barium	mg/L	2	1	1	10	0.00308	0.00208	0.00186	0.00276
Beryllium	mg/L	-	0.00013	0.008	0.0015	<0.0001	<0.0001	<0.0001	<0.0001
Boron	mg/L	5	1.2	5	12	2.54	2.56	2.36	2.57
Cadmium	mg/L	0.007	0.000021	0.005	0.0005	<0.00001	<0.00001	<0.00001	<0.00001
Chromium	mg/L	0.05	0.003	0.05	0.01	<0.001	<0.001	<0.001	<0.001
Cobalt	mg/L	-	0.00014	0.001	0.04	<0.0002	<0.0002	<0.0002	<0.0002
Copper	mg/L	1	0.0024	1.5	0.02	0.00096	0.00044	0.00046	<0.0004
Iron	mg/L	0.1	0.35	6.5	-	<0.02	0.028	0.022	<0.02
Lead	mg/L	0.005	0.0010	0.01	0.16	<0.0001	<0.0001	<0.0001	<0.0001
Lithium	mg/L	-	-	0.008	-	*0.0302*	*0.0299*	*0.028*	*0.0278*
Manganese	mg/L	0.02	0.62	1.5	-	0.00559	0.00486	0.00432	0.00292
Mercury	µg/L	1	0.02	1	0.25	<0.005	<0.005	<0.005	<0.005
Molybdenum	mg/L	-	7.6	0.25	10	0.000346	0.000306	0.000358	0.000359
Nickel	mg/L	-	0.00060	0.08	0.25	<0.001	<0.001	<0.001	<0.001
Selenium	mg/L	0.05	0.002	0.01	0.02	<0.0001	<0.0001	<0.0001	<0.0001
Silver	mg/L	-	0.00012	0.02	0.0005	<0.00002	<0.00002	<0.00002	<0.00002
Strontium	mg/L	7	-	2.5	-	0.00745	0.00618	0.00635	0.00737
Thallium	mg/L	-	-	-	0.003	<0.00002	<0.00002	<0.00002	<0.00002
Tin	mg/L	-	-	2.5	-	<0.0002	<0.0002	<0.0002	<0.0002
Titanium	mg/L	-	-	-	1	0.00079	0.0024	0.00129	<0.0006
Tungsten	mg/L	-	-	0.003	-	*0.00615*	*0.00601*	*0.00694*	*0.00668*
Uranium	mg/L	0.02	0.0085	0.02	0.085	0.000031	0.000032	0.000038	0.000044
Vanadium	mg/L	-	-	0.02	-	<0.001	<0.001	<0.001	<0.001
Zinc	mg/L	5	0.0012	3	0.075	<0.002	<0.002	<0.002	<0.002
NUTRIENTS									
Nitrate	mg/L as N	10	3	10	400	0.0198	0.0066	<0.005	0.0778
Ammonia Nitrogen	mg/L as N	-	1.84	-	1.3	0.308	0.283	0.352	0.303
POLLUTANT TESTS									
Chemical Oxygen Demand	mg/L as O	-	-	-	-	15	<10	<10	12

H:\Project\1005\Analysis\Chemistry\2025\[Tables_B-14 to B-24.xlsx]Table B-14 MW02-1D

NOTES:

Bold denotes parameters which exceed GCDWQ water quality guideline. Underline denotes parameters which exceed BC FWAL guideline. FWAL guideline for arsenic not considered relevant for groundwater. *Italics* denotes parameters which exceed BC CSR DW standard. Yellow highlight denotes parameters which exceed BC CSR AW standard. "-" denotes parameter was not analysed, or a receiving water criteria was not applicable.

1. GCDWQ = Guidelines for Canadian Drinking Water Quality (Health Canada, 2025). Lowest guideline of maximum acceptable concentration or aesthetic objective is shown.
2. Approved and Working Water Quality Guidelines, Science and Information Branch, Environmental Protection Division, BC Ministry of Environment.
   Available: https://www2.gov.bc.ca/assets/gov/environment/air-land-water/water/waterquality/water-quality-guidelines/approved-wqgs/wqg_summary_aquaticlife_wildlife_agri.pdf
   Aquatic life guidelines for cadmium (dissolved), cobalt (dissolved), manganese, silver, and sulphate are based on total hardness, which varies between samples. Guideline for lead (dissolved) varies with hardness and DOC. Guidelines for aluminum and zinc (dissolved) vary with hardness, pH and DOC. Ammonia and sulphate guidelines vary with hardness, temperature, and pH.
   Values are based on average hardness of 4 mg/L, a pH of 9.3, DOC of 0.8 mg/L, and temperature of 10˚ C
3. Per Schedule 3.2 of the Contaminated Sites Regulation (CSR), March 2023. Available: https://www.bclaws.gov.bc.ca/civix/document/id/lc/statreg/375_96_08
   CSR AW standards for cadmium, copper, lead, nickel, silver and zinc are based on total hardness, which varies between samples. Likewise, CSR AW ammonia standards vary with pH. Value shown appropriate for hardness of 4 mg/L-CaCO3 and pH of 7.9.
4. Dissolved copper and dissolved nickel FWAL guideline were calculated for each site using the average BC BLM software calculations between January 2020 - January 2022 with sample-specific parameters except for humic acid ratio (assumed value of 10).

TABLE B-15

INORGANIC CHEMISTRY DATA FOR MW02-4 (BACKGROUND BEDROCK)

SAMPLE DATE		RECEIVING WATER CRITERIA				17-Mar-25	17-Jun-25	16-Sep-25	02-Dec-25
LAB NAME	UNITS	GCDWQ[1]	AQUATIC LIFE (FWAL)[2]	CSR DRINKING WATER (DW)[3]	CSR AQUATIC LIFE (AW)[3]	ALS	ALS	ALS	ALS
PHYSICAL TESTS									
pH-Field	pH	7.0 - 10.5	6.5 - 9.0	-	-	7.21	7.36	7.08	7.93
pH-Lab	pH	7.0 - 10.5	6.5 - 9.0	-	-	7.15	7.92	8.02	7.77
EC-Field	µS/cm	-	-	-	-	341	404	3	379
EC-Lab	µS/cm	-	-	-	-	519	613	575	563
Dissolved Hardness ($CaCO_3$)	mg/L	-	-	-	-	152	158	145	135
Total Dissolved Solids	mg/L	500	-	-	-	369	353	354	366
Temperature-Field	°C	-	-	-	-	8.5	9.6	11.1	9
DISSOLVED ANIONS									
Alkalinity	mg/L $CaCO_3$	-	-	-	-	113	137	137	133
Chloride	mg/L	250	150	250	1500	87.1	104	96.4	96
Sulphate	mg/L	500	309	500	3090	11.6	12.8	13.6	14.5
DISSOLVED CATIONS									
Calcium	mg/L	-	-	-	-	48.6	50.8	45.8	43.6
Magnesium	mg/L	-	-	-	-	7.56	7.61	7.38	6.28
Potassium	mg/L	-	-	-	-	0.347	0.798	1.05	1.04
Sodium	mg/L	200	-	200	-	43.5	54.8	60.2	58.5
DISSOLVED METALS									
Aluminum	mg/L	2.9	0.175	9.5	-	<0.001	<0.001	0.0139	0.0017
Antimony	mg/L	0.006	0.074	0.006	0.09	<0.0001	0.00013	0.0001	0.00011
Arsenic	mg/L	0.01	0.005	0.01	0.05	0.00066	0.00156	0.00201	0.00192
Barium	mg/L	2	1	1	10	0.0165	0.033	0.034	0.0328
Beryllium	mg/L	-	0.00013	0.008	0.0015	<0.0001	<0.0001	<0.0001	<0.0001
Boron	mg/L	5	1.2	5	12	0.401	0.614	0.631	0.648
Cadmium	mg/L	0.007	0.00024	0.005	0.0025	0.0000053	<0.000005	0.0000064	<0.000005
Chromium	mg/L	0.05	0.003	0.05	0.01	<0.0005	<0.0005	<0.0005	<0.0005
Cobalt	mg/L	-	0.00055	0.001	0.04	<0.0001	<0.0001	<0.0001	<0.0001
Copper	mg/L	1	0.0034	1.5	0.05	0.00026	0.00057	0.00045	0.00029
Iron	mg/L	0.1	0.35	6.5	-	<0.01	<0.01	0.017	<0.01
Lead	mg/L	0.005	0.0038	0.01	0.16	<0.00005	<0.00005	<0.00005	<0.00005
Lithium	mg/L	-	-	0.008	-	0.0027	0.007	0.0074	*0.0087*
Manganese	mg/L	0.02	1.13	1.5	-	<0.0001	0.00033	0.00611	0.00117
Mercury	µg/L	1	0.02	1	0.25	<0.005	<0.005	<0.005	<0.005
Molybdenum	mg/L	-	7.6	0.25	10	0.000176	0.000436	0.000464	0.000545
Nickel	mg/L	-	0.0050	0.08	0.65	<0.0005	<0.0005	<0.0005	<0.0005
Selenium	mg/L	0.05	0.002	0.01	0.02	0.000189	0.000133	0.000077	0.000077
Silver	mg/L	-	0.00012	0.02	0.0150	<0.00001	<0.00001	<0.00001	<0.00001
Strontium	mg/L	7	-	2.5	-	0.188	0.424	0.4	0.404
Thallium	mg/L	-	-	-	0.003	<0.00001	<0.00001	<0.00001	<0.00001
Tin	mg/L	-	-	2.5	-	<0.0001	<0.0001	<0.0001	<0.0001
Titanium	mg/L	-	-	-	1	<0.0003	<0.0003	0.00056	<0.0003
Tungsten	mg/L	-	-	0.003	-	<0.0001	<0.0001	<0.0001	<0.0001
Uranium	mg/L	0.02	0.0085	0.02	0.085	0.000105	0.000219	0.000270	0.000414
Vanadium	mg/L	-	-	0.02	-	0.00099	0.00147	0.00152	0.00159
Zinc	mg/L	5	0.019	3	0.900	0.0012	<0.001	0.0012	<0.001
NUTRIENTS									
Nitrate	mg/L as N	10	3	10	400	0.0414	0.0296	0.0874	0.0776
Ammonia Nitrogen	mg/L as N	-	1.84	-	11.3	<0.005	<0.005	0.0151	<0.005
POLLUTANT TESTS									
Chemical Oxygen Demand	mg/L as O	-	-	-	-	22	<10	<10	19

H:\Project\1005\Analysis\Chemistry\2025\[Tables_B-14 to B-24.xlsx]Table B-15 MW02-4

NOTES:

Bold denotes parameters which exceed GCDWQ water quality guideline. Underline denotes parameters which exceed BC FWAL guideline. FWAL guideline for arsenic not considered relevant for groundwater. *Italics* denotes parameters which exceed BC CSR DW standard. Yellow highlight denotes parameters which exceed BC CSR AW standard. "-" denotes parameter was not analysed, or a receiving water criteria was not applicable.

1. GCDWQ = Guidelines for Canadian Drinking Water Quality (Health Canada, 2025). Lowest guideline of maximum acceptable concentration or aesthetic objective is shown.
2. Approved and Working Water Quality Guidelines, Science and Information Branch, Environmental Protection Division, BC Ministry of Environment.
   Available: https://www2.gov.bc.ca/assets/gov/environment/air-land-water/water/waterquality/water-quality-guidelines/approved-wqgs/wqg_summary_aquaticlife_wildlife_agri.pdf
   Aquatic life guidelines for cadmium (dissolved), cobalt (dissolved), manganese, silver, and sulphate are based on total hardness,
   which varies between samples. Guideline for lead (dissolved) varies with hardness and DOC. Guidelines for aluminum and zinc (dissolved)
   vary with hardness, pH and DOC. Ammonia and sulphate guidelines vary with hardness, temperature, and pH.
   Values are based on average hardness of 118 mg/L, a pH of 7.3, DOC of 3.1 mg/L, and temperature of 10˚ C.
3. Per Schedule 3.2 of the Contaminated Sites Regulation (CSR), March 2023. Available: https://www.bclaws.gov.bc.ca/civix/document/id/lc/statreg/375_96_08
   CSR AW standards for cadmium, copper, lead, nickel, silver and zinc are based on total hardness, which varies between samples.
   Likewise, CSR AW ammonia standards vary with pH. Value shown appropriate for hardness of 118 mg/L-CaCO3 and pH of 7.2.
4. Dissolved copper and dissolved nickel FWAL guideline were calculated for each site using the average BC BLM software calculations between January 2020 - January 2022 with sample-specific parameters except for humic acid ratio (assumed value of 10).

TABLE B-16

INORGANIC CHEMISTRY DATA FOR MW05-1 (S-SURFICIAL AND D-BEDROCK)

LOCATION	UNITS	RECEIVING WATER CRITERIA				MW05-1S	MW05-1S	MW05-1S	MW05-1S
SAMPLE DATE						17-Mar-25	17-Jun-25	16-Sep-25	02-Dec-25
LAB NAME		GCDWQ[1]	AQUATIC LIFE (FWAL)[2]	CSR DRINKING WATER (DW)[3]	CSR AQUATIC LIFE (AW)[3]	ALS	ALS	ALS	ALS
PHYSICAL TESTS									
pH-Field	pH	7.0 - 10.5	6.5 - 9.0	-	-	**6.63**	**6.76**	7.07	7.91
pH-Lab	pH	7.0 - 10.5	6.5 - 9.0	-	-	**6.76**	7.29	7.34	**6.85**
EC-Field	µS/cm	-	-	-	-	181	171	93	140
EC-Lab	µS/cm	-	-	-	-	244	244	223	205
Total Dissolved Solids	mg/L	500	-	-	-	236	190	169	176
Temperature-Field	°C	-	-	-	-	9.8	10.4	11.6	10
DISSOLVED ANIONS									
Chloride	mg/L	250	150	250	1500	18.9	17.4	15.4	11.7
Sulphate	mg/L	500	128	500	1280	12.2	11.6	10.5	11.7
NUTRIENTS									
Nitrate	mg/L as N	10	3	10	400	8.68	8.04	7.11	7.12
Ammonia Nitrogen	mg/L as N	-	1.84	-	18.5	<0.005	0.0062	0.0064	<0.005

LOCATION	UNITS	RECEIVING WATER CRITERIA				MW05-1D	MW05-1D	MW05-1D	MW05-1D
SAMPLE DATE						17-Mar-25	17-Jun-25	16-Sep-25	02-Dec-25
LAB NAME		GCDWQ[1]	AQUATIC LIFE[2]	CSR DRINKING WATER (DW)[3]	CSR AQUATIC LIFE (AW)[3]	ALS	ALS	ALS	ALS
PHYSICAL TESTS									
pH-Field	pH	7.0 - 10.5	6.5 - 9.0	-	-	**6.15**	**6.24**	**6.75**	7.05
pH-Lab	pH	7.0 - 10.5	6.5 - 9.0	-	-	7.12	7.55	7.63	7.17
EC-Field	µS/cm	-	-	-	-	617	630	638	613
EC-Lab	µS/cm	-	-	-	-	871	918	907	893
Total Dissolved Solids	mg/L	500	-	-	-	**584**	**556**	**564**	**572**
Temperature-Field	°C	-	-	-	-	9.5	10.1	10.9	9.9
DISSOLVED ANIONS									
Chloride	mg/L	250	150	250	1500	47.9	42.1	43.1	41.2
Sulphate	mg/L	500	128	500	1280	5.63	5.58	5.08	4.99
NUTRIENTS									
Nitrate	mg/L as N	10	3	10	400	<0.025	<0.025	0.041	0.0359
Ammonia Nitrogen	mg/L as N	-	1.84	-	18.5	1.47	1.15	1.62	1.52

NOTES:

Bold denotes parameters which exceed GCDWQ water quality guideline. Underline denotes parameters which exceed BC FWAL guideline. FWAL guideline for arsenic not considered relevant for groundwater. *Italics* denotes parameters which exceed BC CSR DW standard. Yellow highlight denotes parameters which exceed BC CSR AW standard. "-" denotes parameter was not analysed, or a receiving water criteria was not applicable.

1. GCDWQ = Guidelines for Canadian Drinking Water Quality (Health Canada, 2025). Lowest guideline of maximum acceptable concentration or aesthetic objective is shown.
2. Approved and Working Water Quality Guidelines, Science and Information Branch, Environmental Protection Division, BC Ministry of Environment. Available: https://www2.gov.bc.ca/gov/content/environment/air-land-water/water/water-quality/water-quality-guidelines/approved-water-quality-guidelines. Guidelines for the Protection of Fresh-Water Aquatic Life ("FWAL"). BC MOE, 2021.
   Aquatic life guidelines for sulphate vary with hardness and temperature. As hardness was not analyzed at this location, the most conservative standard for sulphate was applied (128 mg/L).
3. Per Schedule 3.2 of Stage 13 Amendment to Contaminated Sites Regulation (CSR), effective March 2021. Available: https://www.bclaws.gov.bc.ca/civix/document/id/lc/bcgaz2/131-2020_Schedule3.2. CSR AW sulphate and ammonia standards vary with hardness and pH, respectively. Value shown appropriate for pH of 7.5 with the most conservative standard for sulphate used.
4. Based on chemistry results compared to previous years, it appears that sample labels for MW05 1S and MW05-1D were mixed up for the June and December samples. These have been reassigned sample IDs based on their chemistry.

TABLE B-17

INORGANIC CHEMISTRY DATA FOR PW-1 AND PW15-1 (BEDROCK)

LOCATION SAMPLE DATE LAB NAME	UNITS	RECEIVING WATER CRITERIA				PW-1 17-Mar-25 ALS	PW-1 16-Jun-25 ALS	PW15-1 22-Sep-25 ALS	PW-1 04-Dec-25 ALS
		GCDWQ[1]	AQUATIC LIFE (FWAL)[2]	CSR DRINKING WATER (DW)[3]	CSR AQUATIC LIFE (AW)[3]				
PHYSICAL TESTS									
pH-Field	pH	7.0 - 10.5	6.5 - 9.0	-	-	**6.77**	**6.13**	**6.75**	7.52
pH-Lab	pH	7.0 - 10.5	6.5 - 9.0	-	-	**6.94**	8.17	**6.86**	7.36
EC-Field	µS/cm	-	-	-	-	638	253	1153	759
EC-Lab	µS/cm	-	-	-	-	943	1010	1350	1120
Dissolved Hardness ($CaCO_3$)	mg/L	-	-	-	-	370	424	480	466
Total Dissolved Solids	mg/L	500	-	-	-	**612**	**656**	**841**	**664**
Temperature-Field	°C	-	-	-	-	9.8	13.9	17	10.7
DISSOLVED ANIONS									
Alkalinity	mg/L $CaCO_3$	-	-	-	-	441	493	468	529
Chloride	mg/L	250	150	250	1500	54.2	69.6	194	71.5
Sulphate	mg/L	500	429	500	4290	11.7	7.74	7.19	14.7
DISSOLVED CATIONS									
Calcium	mg/L	-	-	-	-	108	121	141	133
Magnesium	mg/L	-	-	-	-	24.3	29.5	31.2	32.6
Potassium	mg/L	-	-	-	-	13.5	3.41	3.13	3.22
Sodium	mg/L	200	-	200	-	52.4	65.3	75.2	72.7
DISSOLVED METALS									
Aluminum	mg/L	2.9	0.303	9.5	-	0.0046	0.0016	<0.01	0.0011
Antimony	mg/L	0.006	0.074	0.006	0.09	<0.0001	0.00017	<0.001	0.00015
Arsenic	mg/L	0.01	0.005	0.01	0.05	0.00136	0.00495	0.002	0.00534
Barium	mg/L	2	1	1	10	0.236	0.254	0.363	0.291
Beryllium	mg/L	-	0.00013	0.008	0.0015	<0.0001	<0.0001	<0.0002	<0.0001
Boron	mg/L	5	1.2	5	12	0.721	0.983	1	0.955
Cadmium	mg/L	0.007	0.00053	0.005	0.0040	0.000021	0.000036	0.001240	0.000014
Chromium	mg/L	0.05	0.003	0.05	0.01	<0.0005	<0.0005	<0.005	<0.0005
Cobalt	mg/L	-	0.00085	0.001	0.04	*0.00382*	*0.00288*	*0.0173*	*0.00334*
Copper	mg/L	1	0.0022	1.5	0.09	0.00609	0.0195	0.284	0.00826
Iron	mg/L	0.1	0.35	6.5	-	0.016	**1.08**	<0.1	0.012
Lead	mg/L	0.005	0.0067	0.01	0.16	<0.00005	<0.00005	<0.0005	<0.00005
Lithium	mg/L	-	-	0.008	-	*0.0093*	*0.023*	*0.0246*	*0.0245*
Manganese	mg/L	0.02	2.12	1.5	-	***5.35***	***2.96***	***3.13***	***3.55***
Mercury	µg/L	1	0.02	1	0.25	0.0269	0.0609	<0.005	0.0105
Molybdenum	mg/L	-	7.6	0.25	10	0.000212	0.000264	<0.0005	0.00028
Nickel	mg/L	-	0.012	0.08	1.50	0.00525	0.00662	*2.86*	0.00713
Selenium	mg/L	0.05	0.002	0.01	0.02	<0.00005	<0.00005	<0.0005	0.000052
Silver	mg/L	-	0.00012	0.02	0.0150	<0.00001	0.000069	<0.0001	<0.00001
Strontium	mg/L	7	-	2.5	-	0.79	0.864	1.1	0.974
Thallium	mg/L	-	-	-	0.003	<0.00001	<0.00001	0.00013	<0.00001
Tin	mg/L	-	-	2.5	-	<0.0001	<0.0001	<0.001	<0.0001
Titanium	mg/L	-	-	-	1	<0.0003	<0.0003	<0.003	<0.0003
Tungsten	mg/L	-	-	0.003	-	<0.0001	0.00036	<0.001	0.00032
Uranium	mg/L	0.02	0.0085	0.02	0.085	0.00017	0.000214	0.000242	0.000221
Vanadium	mg/L	-	-	0.02	-	<0.0005	<0.0005	<0.005	<0.0005
Zinc	mg/L	5	0.079	3	2.400	0.0325	0.13	***49.8***	0.0409
NUTRIENTS									
Nitrate	mg/L as N	10	3	10	400	0.105	0.243	0.0346	<0.025
Ammonia Nitrogen	mg/L as N	-	1.84	-	18.5	5.4	2.89	3.63	3.62
POLLUTANT TESTS									
Chemical Oxygen Demand		-	-	-	-	36	27	42	63

H:\Project\1005\Analysis\Chemistry\2025\[Tables_B-14 to B-24.xlsx]Table B-17 PW-1

NOTES:

Bold denotes parameters which exceed GCDWQ water quality guideline. Underline denotes parameters which exceed BC FWAL guideline. FWAL guideline for arsenic not considered relevant for groundwater. *Italics* denotes parameters which exceed BC CSR DW standard. Yellow highlight denotes parameters which exceed BC CSR AW standard. "-" denotes parameter was not analysed, or a receiving water criteria was not applicable.

1. GCDWQ = Guidelines for Canadian Drinking Water Quality (Health Canada, 2025). Lowest guideline of maximum acceptable concentration or aesthetic objective is shown.
2. Approved and Working Water Quality Guidelines, Science and Information Branch, Environmental Protection Division, BC Ministry of Environment.
   Available: https://www2.gov.bc.ca/assets/gov/environment/air-land-water/water/waterquality/water-quality-guidelines/approved-wqgs/wqg_summary_aquaticlife_wildlife_agri.pdf
   Aquatic life guidelines for cadmium (dissolved), cobalt (dissolved), manganese, silver, and sulphate are based on total hardness, which varies between samples. Guideline for lead (dissolved) varies with hardness and DOC. Guidelines for aluminum and zinc (dissolved) vary with hardness, pH and DOC. Ammonia and sulphate guidelines vary with hardness, temperature, and pH.
   Values are based on average hardness of 345 mg/L, a pH of 7.1, DOC of 5.9 mg/L, and temperature of 10˚ C
3. Per Schedule 3.2 of the Contaminated Sites Regulation (CSR), March 2023. Available: https://www.bclaws.gov.bc.ca/civix/document/id/lc/statreg/375_96_08
   CSR AW standards for cadmium, copper, lead, nickel, silver and zinc are based on total hardness, which varies between samples. Likewise, CSR AW ammonia standards vary with pH. Value shown appropriate for hardness of 345 mg/L-CaCO3 and pH of 6.8.

TABLE B-18

INORGANIC CHEMISTRY DATA FOR PW-2 AND PW15-2 (SURFICIAL)

LOCATION SAMPLE DATE LAB NAME	UNITS	RECEIVING WATER CRITERIA				PW-2 17-Mar-25 ALS	PW-2 16-Jun-25 ALS	PW-2 22-Sep-25 ALS	PW-2 04-Dec-25 ALS
		GCDWQ[1]	AQUATIC LIFE (FWAL)[2]	CSR DRINKING WATER (DW)[3]	CSR AQUATIC LIFE (AW)[3]				
PHYSICAL TESTS									
pH-Field	pH	7.0 - 10.5	6.5 - 9.0	-	-	**6.55**	**6.00**	**5.94**	8.17
pH-Lab	pH	7.0 - 10.5	6.5 - 9.0	-	-	**6.70**	7.28	**6.96**	**6.94**
EC-Field	µS/cm	-	-	-	-	253	800	1443	931
EC-Lab	µS/cm	-	-	-	-	753	3210	1860	1200
Dissolved Hardness ($CaCO_3$)	mg/L	-	-	-	-	236	756	447	269
Total Dissolved Solids	mg/L	500	-	-	-	440	**1630**	**863**	**551**
Temperature-Field	°C	-	-	-	-	9.7	14	13.4	13.2
DISSOLVED ANIONS									
Alkalinity	mg/L $CaCO_3$	-	-	-	-	325	1400	786	528
Chloride	mg/L	250	150	250	1500	38.2	***280***	156	64.5
Sulphate	mg/L	500	429	500	4290	21	<6	4.6	18.5
DISSOLVED CATIONS									
Calcium	mg/L	-	-	-	-	75	217	126	78.4
Magnesium	mg/L	-	-	-	-	11.9	52	32.2	17.8
Potassium	mg/L	-	-	-	-	11.8	56.7	32.4	27
Sodium	mg/L	200	-	200	-	38.7	***232***	129	77.5
DISSOLVED METALS									
Aluminum	mg/L	2.9	0.449	9.5	-	0.0031	0.0043	0.0036	0.0014
Antimony	mg/L	0.006	0.074	0.006	0.09	<0.0001	0.00027	0.00019	0.00011
Arsenic	mg/L	0.01	0.005	0.01	0.05	0.00028	0.0093	0.00323	0.00197
Barium	mg/L	2	1	1	10	0.0274	0.237	0.0904	0.049
Beryllium	mg/L	-	0.00013	0.008	0.0015	<0.0001	<0.0001	<0.0001	<0.0001
Boron	mg/L	5	1.2	5	12	0.524	1.94	1.07	0.876
Cadmium	mg/L	0.007	0.00052	0.005	0.0040	<0.000005	0.000105	0.0000998	0.0000302
Chromium	mg/L	0.05	0.003	0.05	0.01	<0.0005	0.00178	0.00078	0.00078
Cobalt	mg/L	-	0.00085	0.001	0.04	0.00084	*0.00596*	*0.00612*	*0.00226*
Copper	mg/L	1	0.0124	1.5	0.09	0.00156	0.0222	0.136	0.0261
Iron	mg/L	0.1	0.35	6.5	-	0.012	***27.4***	0.018	0.03
Lead	mg/L	0.005	0.013	0.01	0.16	<0.00005	0.000214	<0.00005	<0.00005
Lithium	mg/L	-	-	0.008	-	<0.001	<0.002	<0.001	<0.001
Manganese	mg/L	0.02	2.11	1.5	-	***3.41***	***6.84***	***4.57***	***3.36***
Mercury	µg/L	1	0.02	1	0.25	<0.005	0.0085	<0.005	<0.005
Molybdenum	mg/L	-	7.6	0.25	10	0.000156	0.000663	0.000622	0.000336
Nickel	mg/L	-	0.018	0.08	1.50	0.00527	*0.0922*	0.0502	0.0105
Selenium	mg/L	0.05	0.002	0.01	0.02	<0.00005	0.0002	0.000132	0.000102
Silver	mg/L	-	0.00012	0.02	0.0150	<0.00001	<0.00002	<0.00001	<0.00001
Strontium	mg/L	7	-	2.5	-	0.358	1.5	0.831	0.462
Thallium	mg/L	-	-	-	0.003	<0.00001	<0.00002	0.000015	<0.00001
Tin	mg/L	-	-	2.5	-	0.000100	0.000300	0.00018	<0.0001
Titanium	mg/L	-	-	-	1	<0.0003	0.00173	<0.0003	<0.0003
Tungsten	mg/L	-	-	0.003	-	<0.0001	<0.0002	<0.0001	<0.0001
Uranium	mg/L	0.02	0.0085	0.02	0.085	0.000027	0.000329	0.000235	0.000052
Vanadium	mg/L	-	-	0.02	-	<0.0005	0.00601	0.0006	0.00056
Zinc	mg/L	5	0.16	3	2.4	0.013	0.834	*3.5*	0.508
NUTRIENTS									
Nitrate	mg/L as N	10	3	10	400	0.0472	1.29	<0.05	0.0535
Ammonia Nitrogen	mg/L as N	-	1.84	-	18.4	12.1	119	63.9	48.6
POLLUTANT TESTS									
Chemical Oxygen Demand		-	-	-	-	37	197	92	53

H:\Project\1005\Analysis\Chemistry\2025\[Tables_B-14 to B-24.xlsx]Table B-18 PW-2

NOTES:

Bold denotes parameters which exceed GCDWQ water quality guideline. Underline denotes parameters which exceed BC FWAL guideline. FWAL guideline for arsenic not considered relevant for groundwater. *Italics* denotes parameters which exceed BC CSR DW standard. Yellow highlight denotes parameters which exceed BC CSR AW standard. "-" denotes parameter was not analysed, or a receiving water criteria was not applicable.

1. GCDWQ = Guidelines for Canadian Drinking Water Quality (Health Canada, 2025). Lowest guideline of maximum acceptable concentration or aesthetic objective is shown.
2. Approved and Working Water Quality Guidelines, Science and Information Branch, Environmental Protection Division, BC Ministry of Environment. Available: https://www2.gov.bc.ca/assets/gov/environment/air-land-water/water/waterquality/water-quality-guidelines/approved-wqgs/wqg_summary_aquaticlife_wildlife_agri.pdf
   Aquatic life guidelines for cadmium (dissolved), manganese, silver, and sulphate are based on total hardness, which varies between samples.
   Guideline for lead (dissolved) varies with hardness and DOC. Guidelines for aluminum and zinc (dissolved) vary with hardness, pH and DOC.
   Ammonia and sulphate guidelines vary with hardness, temperature, and pH.
   Values are based on average hardness of 341 mg/L, a pH of 6.9, DOC of 21.4 mg/L, and temperature of 10˚ C
3. Per Schedule 3.2 of the Contaminated Sites Regulation (CSR), March 2023. Available: https://www.bclaws.gov.bc.ca/civix/document/id/lc/statreg/375_96_08
   CSR AW standards for cadmium, copper, lead, nickel, silver and zinc are based on total hardness, which varies between samples.
   Likewise, CSR AW ammonia standards vary with pH. Value shown appropriate for hardness of 341 mg/L-CaCO3 and pH of 6.7.
4. Dissolved copper and dissolved nickel FWAL guideline were calculated for each site using the average BC BLM software calculations between January 2020 - January 2022 with sample-specific parameters except for humic acid ratio (assumed value of 10).

TABLE B-19

INORGANIC CHEMISTRY DATA FOR MW13-1S AND MW13-2S (BEDROCK)

LOCATION	UNITS	RECEIVING WATER CRITERIA				MW13-1S	MW13-1S	MW13-1S	MW13-1S
SAMPLE DATE						18-Mar-25	18-Jun-25	10-Sep-25	04-Dec-25
LAB NAME		GCDWQ[1]	AQUATIC LIFE (FWAL)[2]	CSR DRINKING WATER (DW)[3]	CSR AQUATIC LIFE (AW)[3]	ALS	ALS	ALS	ALS
PHYSICAL TESTS									
pH-Field	pH	7.0 - 10.5	6.5 - 9.0	-	-	7.32	7.95	**6.94**	7.66
pH-Lab	pH	7.0 - 10.5	6.5 - 9.0	-	-	8.16	8.04	8.07	8.1
EC-Field	µS/cm	-	-	-	-	652	740	835	747
EC-Lab	µS/cm	-	-	-	-	996	1070	1040	1050
Total Dissolved Solids	mg/L	500	-	-	-	**590**	**673**	**649**	**615**
Temperature-Field	°C	-	-	-	-	9.4	11.2	13.4	10
DISSOLVED ANIONS									
Chloride	mg/L	250	150	250	1500	226	247	248	251
Sulphate	mg/L	500	218	500	2180	4.53	6.5	7.32	10.6
NUTRIENTS									
Nitrate	mg/L as N	10	3	10	400	<0.025	<0.025	<0.025	<0.025
Ammonia Nitrogen	mg/L as N	-	1.84	-	3.7	0.126	0.168	0.208	0.221

LOCATION	UNITS	RECEIVING WATER CRITERIA				MW13-2S	MW13-2S	MW13-2S	MW13-2S
SAMPLE DATE						18-Mar-25	18-Jun-25	10-Sep-25	04-Dec-25
LAB NAME		GCDWQ[1]	AQUATIC LIFE[2]	CSR DRINKING WATER (AW)[3]	CSR AQUATIC LIFE (AW)[3]	ALS	ALS	ALS	ALS
PHYSICAL TESTS									
pH-Field	pH	7.0 - 10.5	6.5 - 9.0	-	-	7.96	7.83	8.45	8.19
pH-Lab	pH	7.0 - 10.5	6.5 - 9.0	-	-	7.95	7.61	7.77	7.72
EC-Field	µS/cm	-	-	-	-	103	75.6	163.8	149
EC-Lab	µS/cm	-	-	-	-	153	109	204	211
Total Dissolved Solids	mg/L	500	-	-	-	107	82	135	146
Temperature-Field	°C	-	-	-	-	9.2	11.1	11.6	10
DISSOLVED ANIONS									
Chloride	mg/L	250	150	250	1500	1.63	3.19	6.97	4.28
Sulphate	mg/L	500	218	500	2180	2.86	1.27	4.09	3.02
NUTRIENTS									
Nitrate	mg/L as N	10	3	10	400	0.97	0.116	0.331	6.62
Ammonia Nitrogen	mg/L as N	-	1.84	-	11.3	0.0196	0.0194	0.0534	0.034

NOTES:

Bold denotes parameters which exceed GCDWQ water quality guideline. Underline denotes parameters which exceed BC FWAL guideline. FWAL guideline for arsenic not considered relevant for groundwater. *Italics* denotes parameters which exceed BC CSR DW standard. Yellow highlight denotes parameters which exceed BC CSR AW standard. "-" denotes parameter was not analysed, or a receiving water criteria was not applicable.

1. GCDWQ = Guidelines for Canadian Drinking Water Quality (Health Canada, 2025). Lowest guideline of maximum acceptable concentration or aesthetic objective is shown.
2. Approved and Working Water Quality Guidelines, Science and Information Branch, Environmental Protection Division, BC Ministry of Environment. Available: https://www2.gov.bc.ca/gov/content/environment/air-land-water/water/water-quality/water-quality-guidelines/approved-water-quality-guidelines. Guidelines for the Protection of Fresh-Water Aquatic Life ("FWAL"). BC MOE, 2021.
   Ammonia guidelines vary with hardness, temperature, and pH. Values are based on average hardness of 60 mg/L, 10˚ C and a pH of 7.9.
3. Per Schedule 3.2 of Stage 13 Amendment to Contaminated Sites Regulation (CSR), effective March 2023. Available: https://www.bclaws.gov.bc.ca/civix/document/id/lc/bcgaz2/131-2020_Schedule3.2. CSR AW sulphate and ammonia standards vary with hardness and pH, respectively. Value shown appropriate for pH of 7.9 with the most conservative standard for sulphate applied.

TABLE B-20

INORGANIC CHEMISTRY DATA FOR MW13-1D (BEDROCK)

SAMPLE DATE	UNITS	RECEIVING WATER CRITERIA				16-Sep-25
LAB NAME		GCDWQ[1]	AQUATIC LIFE (FWAL)[2]	CSR DRINKING WATER (DW)[3]	CSR AQUATIC LIFE (AW)[3]	ALS
PHYSICAL TESTS						
pH-Field	pH	7.0 - 10.5	6.5 - 9.0	-	-	7.57
pH-Lab	pH	7.0 - 10.5	6.5 - 9.0	-	-	7.93
EC-Field	µS/cm	-	-	-	-	757
EC-Lab	µS/cm	-	-	-	-	1100
Dissolved Hardness	mg/L	-	-	-	-	221
Total Dissolved Solids	mg/L	500	-	-	-	**668**
Temperature-Field	°C	-	-	-	-	11.3
DISSOLVED ANIONS						
Alkalinity	mg CaCO3/L	-	-	-	-	249
Chloride	mg/L	250	150	250	1500	185
Sulphate	mg/L	500	128	500	1280	29.9
DISSOLVED CATIONS						
Calcium	mg/L	-	-	-	-	70.7
Magnesium	mg/L	-	-	-	-	10.9
Potassium	mg/L	-	-	-	-	1.87
Sodium	mg/L	200	-	200	-	157
DISSOLVED METALS						
Aluminum	mg/L	2.9	0.617	9.5	-	0.0111
Antimony	mg/L	0.006	0.074	0.006	0.09	0.00025
Arsenic	mg/L	0.01	0.005	0.01	0.05	0.00279
Barium	mg/L	2	1	1	10	0.252
Beryllium	mg/L	-	0.00013	0.008	0.0015	<0.0001
Boron	mg/L	5	1.2	5	12	0.305
Cadmium	mg/L	0.007	0.00019	0.005	0.0005	<0.000005
Chromium	mg/L	0.05	0.003	0.05	0.01	<0.0005
Cobalt	mg/L	-	0.00048	0.001	0.04	0.00042
Copper	mg/L	1	0.022	1.5	0.02	<0.0002
Iron	mg/L	0.1	0.35	6.5	-	**1.56**
Lead	mg/L	0.005	0.0073	0.01	0.16	<0.00005
Lithium	mg/L	-	-	0.008	-	*0.0271*
Manganese	mg/L	0.02	0.61	1.5	-	***1.58***
Mercury	µg/L	1	0.02	1	0.25	0.0156
Molybdenum	mg/L	-	7.6	0.25	10	0.000818
Nickel	mg/L	-	0.0080	0.08	0.25	0.011
Selenium	mg/L	0.05	0.0020	0.01	0.02	0.000139
Silver	mg/L	-	0.00012	0.02	0.0005	<0.00001
Strontium	mg/L	7	-	2.5	-	1.03
Thallium	mg/L	-	-	-	0.003	<0.00001
Tin	mg/L	-	-	2.5	-	<0.0001
Titanium	mg/L	-	-	-	1	0.0003
Tungsten	mg/L	-	-	0.003	-	<0.0001
Uranium	mg/L	0.02	0.01	0.02	0.085	0.00291
Vanadium	mg/L	-	-	0.02	-	0.00059
Zinc	mg/L	5	0.015	3	0.075	0.0046
NUTRIENTS						
Nitrate	mg/L as N	10	3	10	400	<0.025
Ammonia Nitrogen	mg/L as N	-	1.84	-	11.30	0.47
POLLUTANT TESTS						
Chemical Oxygen Demand	mg/L as O	-	-	-	-	<10

H:\Project\1005\Analysis\Chemistry\2025\[Tables_B-14 to B-24.xlsx]Table B-20 MW13-1D

NOTES:

Bold denotes parameters which exceed GCDWQ water quality guideline. Underline denotes parameters which exceed BC FWAL guideline. FWAL guideline for arsenic not considered relevant for groundwater. *Italics* denotes parameters which exceed BC CSR DW standard. Yellow highlight denotes parameters which exceed BC CSR AW standard. "-" denotes parameter was not analysed, or a receiving water criteria was not applicable.

1. GCDWQ = Guidelines for Canadian Drinking Water Quality (Health Canada, 2025). Lowest guideline of maximum acceptable concentration or aesthetic objective is shown.
2. Approved and Working Water Quality Guidelines, Science and Information Branch, Environmental Protection Division, BC Ministry of Environment. Available: https://www2.gov.bc.ca/assets/gov/environment/air-land-water/water/waterquality/water-quality-guidelines/approved-wqgs/wqg_summary_aquaticlife_wildlife_agri.pdf
   Aquatic life guidelines for cadmium (dissolved), cobalt (dissolved), manganese, silver, and sulphate are based on total hardness, which varies between samples. Guideline for lead (dissolved) varies with hardness and DOC. Guidelines for aluminum and zinc (dissolved) vary with hardness, pH and DOC. Ammonia and sulphate guidelines vary with hardness, temperature, and pH. Values are based on average hardness of 86 mg/L, a pH of 7.6, DOC of 12.3 mg/L, and temperature of 10˚ C
3. Per Schedule 3.2 of the Contaminated Sites Regulation (CSR), March 2023. Available: https://www.bclaws.gov.bc.ca/civix/document/id/lc/statreg/375_96_08
   CSR AW standards for cadmium, copper, lead, nickel, silver and zinc are based on total hardness, which varies between samples. Likewise, CSR AW ammonia standards vary with pH. Value shown appropriate for hardness of 86 mg/L-CaCO3 and pH of 7.6.
4. Dissolved copper and dissolved nickel FWAL guideline were calculated for each site using the average BC BLM software calculations between January 2020 - January 2022 with sample-specific parameters except for humic acid ratio (assumed value of 10).

TABLE B-21
INORGANIC CHEMISTRY DATA FOR HEATH CREEK

SAMPLE DATE	UNITS	RECEIVING WATER CRITERIA				18-Mar-25	16-Jun-25	15-Sep-25	01-Dec-25
LAB NAME		GCDWQ[1]	AQUATIC LIFE (FWAL)[2]	CSR DRINKING WATER (DW)[3]	CSR AQUATIC LIFE (AW)[3]	ALS	ALS	ALS	ALS
PHYSICAL TESTS									
pH-Field	pH	7.0 - 10.5	6.5 - 9.0	-	-	7.83	**6.56**	7.59	**6.79**
pH-Lab	pH	7.0 - 10.5	6.5 - 9.0	-	-	7.31	7.52	7.45	7.45
EC-Field	µS/cm	-	-	-	-	28.6	55.2	149.2	37.2
EC-Lab	µS/cm	-	-	-	-	46.9	76.3	145	58.5
Total Hardness (CaCO3)	mg/L	-	-	-	-	18.8	31.7	31	24
Temperature-Field	°C	-	-	-	-	5.5	12.6	16.7	6.7
DISSOLVED ANIONS									
Alkalinity	mg CaCO3/L	-	-	-	-	16.9	32.2	38.3	24.6
Chloride	mg/L	250	150	250	1500	3.22	4.11	19.1	3.58
Sulphate	mg/L	500	128	500	1280	0.72	0.77	0.71	0.91
TOTAL CATIONS									
Calcium	mg/L	-	-	-	-	5.63	9.6	9.21	7.3
Magnesium	mg/L	-	-	-	-	1.14	1.88	1.95	1.39
Potassium	mg/L	-	-	-	-	0.10	0.188	17.6	0.166
Sodium	mg/L	200	-	200	-	2.3	3.06	3.42	2.15
TOTAL METALS									
Aluminum	mg/L	2.9	0.215	9.5	-	0.101	0.0762	0.0252	0.0437
Antimony	mg/L	0.006	0.074	0.006	0.09	<0.0001	<0.0001	<0.0001	<0.0001
Arsenic	mg/L	0.01	0.005	0.01	0.05	<0.0001	0.00014	0.00014	<0.0001
Barium	mg/L	2	1	1	10	0.00218	0.00289	0.00335	0.00233
Beryllium	mg/L	-	0.00013	0.008	0.0015	<0.0001	<0.0001	<0.0001	<0.0001
Boron	mg/L	5	1.2	5	12	0.0172	0.027	0.037	0.024
Cadmium	mg/L	0.007	0.000073	0.005	0.0005	<0.000005	<0.000005	0.0000139	<0.000005
Chromium	mg/L	0.05	0.003	0.05	0.01	<0.0005	<0.0005	<0.0005	<0.0005
Cobalt	mg/L	-	0.00028	0.001	0.04	<0.0001	<0.0001	<0.0001	<0.0001
Copper	mg/L	1	0.00095	1.5	0.02	0.000862	0.00074	0.00121	0.00058
Iron	mg/L	0.1	1	6.5	-	**0.116**	**0.11**	**0.251**	**0.108**
Lead	mg/L	0.005	0.0026	0.01	0.16	<0.00005	<0.00005	<0.00005	<0.00005
Lithium	mg/L	-	-	0.008	-	<0.001	<0.001	<0.001	<0.001
Manganese	mg/L	0.02	0.71	1.5	-	0.00664	0.0119	**0.0267**	0.00322
Mercury	µg/L	1	0.02	1	0.25	<0.005	<0.005	<0.005	<0.005
Molybdenum	mg/L	-	7.6	0.25	10	<0.00005	<0.00005	<0.00005	<0.00005
Nickel	mg/L	-	0.0018	0.08	0.25	<0.0005	<0.0005	<0.0005	<0.0005
Selenium	mg/L	0.05	0.002	0.01	0.02	<0.00005	<0.00005	<0.00005	<0.00005
Silver	mg/L	-	0.00012	0.02	0.0005	<0.00001	<0.00001	0.000015	<0.00001
Strontium	mg/L	7	-	2.5	-	0.0126	0.0209	0.0232	0.0156
Thallium	mg/L	-	-	-	0.003	<0.00001	<0.00001	<0.00001	<0.00001
Tin	mg/L	-	-	2.5	-	<0.0001	<0.0001	<0.0001	<0.0001
Titanium	mg/L	-	-	-	1	0.00691	0.00642	0.00233	0.00341
Tungsten	mg/L	-	-	0.003	-	<0.0001	<0.0001	<0.0001	<0.0001
Uranium	mg/L	0.02	0.0085	0.02	0.085	<0.00001	<0.00001	<0.00001	<0.00001
Vanadium	mg/L	-	-	0.02	-	0.000599	0.00079	0.0007	<0.0005
Zinc	mg/L	5	0.0027	3	0.075	<0.003	0.0098	<0.003	<0.003
NUTRIENTS									
Nitrate	mg/L as N	10	3	10	400	0.041	0.247	0.0769	0.0964
Ammonia Nitrogen	mg/L as N	-	1.84	-	18.5	0.0057	<0.005	0.0125	0.0052
Total Phosphorus	mg/L as P	-	0.005	-	-	0.0044	0.0081	0.1540	0.0053
POLLUTANT TESTS									
Chemical Oxygen Demand	mg/L as O	-	-	-	-	<10	<10	<10	23

H:\Project\1005\Analysis\Chemistry\2025\[Tables_B-14 to B-24.xlsx]Table B-21 HeathCrk

NOTES:

Bold denotes parameters which exceed GCDWQ water quality guideline. Underline denotes parameters which exceed BC FWAL guideline. FWAL guideline for arsenic not considered relevant for groundwater. *Italics* denotes parameters which exceed BC CSR DW standard. Yellow highlight denotes parameters which exceed BC CSR AW standard. "-" denotes parameter was not analysed, or a receiving water criteria was not applicable.

1. GCDWQ = Guidelines for Canadian Drinking Water Quality (Health Canada, 2025). Lowest guideline of maximum acceptable concentration or aesthetic objective is shown.
2. Approved and Working Water Quality Guidelines, Science and Information Branch, Environmental Protection Division, BC Ministry of Environment.
   Available: https://www2.gov.bc.ca/assets/gov/environment/air-land-water/water/waterquality/water-quality-guidelines/approved-wqgs/wqg_summary_aquaticlife_wildlife_agri.pdf
   Aquatic life guidelines for cadmium (dissolved), cobalt (dissolved), manganese, silver, and sulphate are based on total hardness, which varies between samples. Guideline for lead (dissolved) varies with hardness and DOC. Guidelines for aluminum and zinc (dissolved) vary with hardness, pH and DOC. Ammonia and sulphate guidelines vary with hardness, temperature, and pH.
   Values are based on average hardness of 24 mg/L, a pH of 7.8, DOC of 2.8 mg/L, and temperature of 10˚ C
   Phosphorus FWAL guideline for creeks from Phosphorous Management in Vancouver Island Streams. Available: https://www2.gov.bc.ca/assets/gov/environment/air-land-water/water/waterquality/water-quality-reference-documents/phosphorous_management_vi_streams_guidance_2014.pdf. BC MOE, April 2014. Monthly average of May to September samples for total phosphorus should not exceed 0.005 mg/L, and maximum total phosphorus for this period should not exceed 0.01 mg/L in any one sample. May to September results compared against stringent guideline of 0.005 mg/L.
3. Per Schedule 3.2 of the Contaminated Sites Regulation (CSR), March 2023.
   Available: https://www.bclaws.gov.bc.ca/civix/document/id/lc/statreg/375_96_08
   CSR AW standards for cadmium, copper, lead, nickel, silver and zinc are based on total hardness, which varies between samples. Likewise, CSR AW ammonia standards vary with pH. Value shown appropriate for hardness of 24 mg/L-CaCO3 and pH of 7.2.
   AW guidelines assume minimum 1:10 dilution is available. As such, samples from creeks are compared against CSR AW standards/10.
4. Dissolved copper and dissolved nickel FWAL guideline were calculated for each site using the average BC BLM software calculations between January 2020 - January 2022 with sample-specific parameters except for humic acid ratio (assumed value of 10).

TABLE B-22
INORGANIC CHEMISTRY DATA FOR STEVENS CREEK

SAMPLE DATE	UNITS	RECEIVING WATER CRITERIA				18-Mar-25	16-Jun-25	15-Sep-25	01-Dec-25
LAB NAME		GCDWQ[1]	AQUATIC LIFE (FWAL)[2]	CSR DRINKING WATER (DW)[3]	CSR AQUATIC LIFE (AW)[3]	ALS			ALS
PHYSICAL TESTS									
pH-Field	pH	7.0 - 10.5	6.5 - 9.0	-	-	7.78			**6.8**
pH-Lab	pH	7.0 - 10.5	6.5 - 9.0	-	-	7.23			7.36
EC-Field	µS/cm	-	-	-	-	46.7	DRY	DRY	69.1
EC-Lab	µS/cm	-	-	-	-	79.2			104
Total Hardness (CaCO3)	mg/L	-	-	-	-	36.8			44
Temperature-Field	°C	-	-	-	-	5.8			8.2
DISSOLVED ANIONS									
Alkalinity	mg CaCO3/L	-	-	-	-	38.1			46.8
Chloride	mg/L	250	150	250	1500	1.59			3.9
Sulphate	mg/L	500	218	500	2180	0.73			1.08
TOTAL CATIONS									
Calcium	mg/L	-	-	-	-	11.2			13.5
Magnesium	mg/L	-	-	-	-	2.14			2.49
Potassium	mg/L	-	-	-	-	0.37			0.264
Sodium	mg/L	200	-	200	-	2.44			3.24
TOTAL METALS									
Aluminum	mg/L	2.9	0.120	9.5	-	0.85			0.0143
Antimony	mg/L	0.006	0.074	0.006	0.09	<0.0001			<0.0001
Arsenic	mg/L	0.01	0.005	0.01	0.05	0.00016			<0.0001
Barium	mg/L	2	1	1	10	0.00814			0.00094
Beryllium	mg/L	-	0.00013	0.008	0.0015	<0.0001			<0.0001
Boron	mg/L	5	1.2	5	12	0.03			0.041
Cadmium	mg/L	0.007	0.00013	0.005	0.0015	0.0000118			<0.000005
Chromium	mg/L	0.05	0.003	0.05	0.01	0.0014			<0.0005
Cobalt	mg/L	-	0.00039	0.001	0.04	0.00067			<0.0001
Copper	mg/L	1	0.00051	1.5	0.03	0.00303			<0.0005
Iron	mg/L	0.1	1	6.5	-	**1.11**			<0.01
Lead	mg/L	0.005	0.0024	0.01	0.16	0.000253			<0.00005
Lithium	mg/L	-	-	0.008	-	<0.001			<0.001
Manganese	mg/L	0.02	0.84	1.5	-	**0.654**			0.00649
Mercury	µg/L	1	0.02	1	0.25	0.0058			0.0119
Molybdenum	mg/L	-	7.6	0.25	10	<0.00005			<0.00005
Nickel	mg/L	-	0.0020	0.08	0.25	0.00089			<0.0005
Selenium	mg/L	0.05	0.002	0.01	0.02	0.00006			<0.00005
Silver	mg/L	-	0.00012	0.02	0.0005	<0.00001			<0.00001
Strontium	mg/L	7	-	2.5	-	0.0371			0.0441
Thallium	mg/L	-	-	-	0.003	<0.00001			<0.00001
Tin	mg/L	-	-	2.5	-	0.00013			<0.0001
Titanium	mg/L	-	-	-	1	0.074			0.00085
Tungsten	mg/L	-	-	0.003	-	<0.0001			<0.0001
Uranium	mg/L	0.02	0.0085	0.02	0.085	<0.00001			<0.00001
Vanadium	mg/L	-	-	0.02	-	0.00389			<0.0005
Zinc	mg/L	5	0.0062	3	0.075	0.0036			<0.003
NUTRIENTS									
Nitrate	mg/L as N	10	3	10	400	0.106			0.154
Ammonia Nitrogen	mg/L as N	-	1.84	-	18.5	0.0156			0.0095
Total Phosphorus	mg/L as P	-	0.005	-	-	0.0337			0.040
POLLUTANT TESTS									
Chemical Oxygen Demand	mg/L as O	-	-	-	-	22			19

H:\Project\1005\Analysis\Chemistry\2025\[Tables_B-14 to B-24.xlsx]Table B-22 StevensCrk

NOTES:

Bold denotes parameters which exceed GCDWQ water quality guideline. Underline denotes parameters which exceed BC FWAL guideline. FWAL guideline for arsenic not considered relevant for groundwater. *Italics* denotes parameters which exceed BC CSR DW standard. Yellow highlight denotes parameters which exceed BC CSR AW standard. "-" denotes parameter was not analysed, or a receiving water criteria was not applicable.

1. GCDWQ = Guidelines for Canadian Drinking Water Quality (Health Canada, 2025). Lowest guideline of maximum acceptable concentration or aesthetic objective is shown.
2. Approved and Working Water Quality Guidelines, Science and Information Branch, Environmental Protection Division, BC Ministry of Environment.
   Available: https://www2.gov.bc.ca/assets/gov/environment/air-land-water/water/waterquality/water-quality-guidelines/approved-wqgs/wqg_summary_aquaticlife_wildlife_agri.pdf
   Aquatic life guidelines for cadmium (dissolved), cobalt (dissolved), manganese, silver, and sulphate are based on total hardness, which varies between samples. Guideline for lead (dissolved) varies with hardness and DOC. Guidelines for aluminum and zinc (dissolved) vary with hardness, pH and DOC. Ammonia and sulphate guidelines vary with hardness, temperature, and pH.
   Values are based on average hardness of 53 mg/L, a pH of 7.5, DOC of 1.7 mg/L, and temperature of 10° C
   Phosphorus FWAL guideline for creeks from Phosphorous Management in Vancouver Island Streams. Available: https://www2.gov.bc.ca/assets/gov/environment/air-land-water/water/waterquality/water-quality-reference-documents/phosphorous_management_vi_streams_guidance_2014.pdf. BC MOE, April 2014. Monthly average of May to September samples for total phosphorus should not exceed 0.005 mg/L, and maximum total phosphorus for this period should not exceed 0.01 mg/L in any one sample. May to September results compared against stringent guideline of 0.005 mg/L.
3. Per Schedule 3.2 of the Contaminated Sites Regulation (CSR), March 2023.
   Available: https://www.bclaws.gov.bc.ca/civix/document/id/lc/statreg/375_96_08
   CSR AW standards for cadmium, copper, lead, nickel, silver and zinc are based on total hardness, which varies between samples. Likewise, CSR AW ammonia standards vary with pH. Value shown appropriate for hardness of 0 mg/L-CaCO3 and pH of 7.3.
   AW guidelines assume minimum 1:10 dilution is available. As such, samples from creeks are compared against CSR AW standards/10.
4. Dissolved copper and dissolved nickel FWAL guideline were calculated for each site using the average BC BLM software calculations between January 2020 - January 2022 with sample-specific parameters except for humic acid ratio (assumed value of 10).

TABLE B-23
INORGANIC CHEMISTRY DATA FOR CHRISTIE CREEK DOWNSTREAM

SAMPLE DATE		RECEIVING WATER CRITERIA				18-Mar-25	16-Jun-25	29-Jul-24	01-Dec-25
LAB NAME	UNITS	GCDWQ[1]	AQUATIC LIFE (FWAL)[2]	CSR DRINKING WATER (DW)[3]	CSR AQUATIC LIFE (AW)[3]	ALS			
PHYSICAL TESTS									
pH-Field	pH	7.0 - 10.5	6.5 - 9.0	-	-	7.94			
pH-Lab	pH	7.0 - 10.5	6.5 - 9.0	-	-	7.06			
EC-Field	µS/cm	-	-	-	-	33	DRY	DRY	NO
EC-Lab	µS/cm	-	-	-	-	54.9			ACCESS
Total Hardness ($CaCO_3$)	mg/L	-	-	-	-	26			
Temperature-Field	°C	-	-	-	-	4.7			
DISSOLVED ANIONS									
Alkalinity	mg CaCO3/L	-	-	-	-	26.2			
Chloride	mg/L	250	150	250	1500	1.17			
Sulphate	mg/L	500	128	500	1280	1.06			
TOTAL CATIONS									
Calcium	mg/L	-	-	-	-	7.59			
Magnesium	mg/L	-	-	-	-	1.72			
Potassium	mg/L	-	-	-	-	0.35			
Sodium	mg/L	200	-	200	-	1.58			
TOTAL METALS									
Aluminum	mg/L	2.9	0.198	9.5	-	0.24			
Antimony	mg/L	0.006	0.074	0.006	0.09	<0.0001			
Arsenic	mg/L	0.01	0.005	0.01	0.05	0.000139			
Barium	mg/L	2	1	1	10	0.00298			
Beryllium	mg/L	-	0.00013	0.008	0.0015	<0.0001			
Boron	mg/L	5	1.2	5	12	0.0123			
Cadmium	mg/L	0.007	0.000087	0.005	0.0005	0.0000065			
Chromium	mg/L	0.05	0.003	0.05	0.01	0.000561			
Cobalt	mg/L	-	0.00031	0.001	0.04	0.000187			
Copper	mg/L	1	0.0008	1.5	0.02	0.0017			
Iron	mg/L	0.1	1	6.5	-	**0.332**			
Lead	mg/L	0.005	0.0031	0.01	0.16	0.0000649			
Lithium	mg/L	-	-	0.008	-	<0.001			
Manganese	mg/L	0.02	0.74	1.5	-	**0.0348**			
Mercury	µg/L	1	0.02	1	0.25	<0.005			
Molybdenum	mg/L	-	7.6	0.25	10	<0.00005			
Nickel	mg/L	-	0.0020	0.08	0.25	<0.0005			
Selenium	mg/L	0.05	0.002	0.01	0.02	<0.00005			
Silver	mg/L	-	0.00012	0.02	0.0005	<0.00001			
Strontium	mg/L	7	-	2.5	-	0.0204			
Thallium	mg/L	-	-	-	0.003	<0.00001			
Tin	mg/L	-	-	2.5	-	<0.0001			
Titanium	mg/L	-	-	-	1	0.0186			
Tungsten	mg/L	-	-	0.003	-	<0.0001			
Uranium	mg/L	0.02	0.0085	0.02	0.085	<0.00001			
Vanadium	mg/L	-	-	0.02	-	0.000976			
Zinc	mg/L	5	0.0044	3	0.075	0.0363			
NUTRIENTS									
Nitrate	mg/L as N	10	3	10	400	0.127			
Ammonia Nitrogen	mg/L as N	-	1.84	-	18.5	0.0174			
Total Phosphorus	mg/L as P	-	0.005	-	-	0.0076			
POLLUTANT TESTS									
Chemical Oxygen Demand	mg/L as O	-	-	-	-	16			

H:\Project\1005\Analysis\Chemistry\2025\[Tables_B-14 to B-24.xlsx]Table B-23 ChristieCrk (DS)

NOTES:

Bold denotes parameters which exceed GCDWQ water quality guideline. Underline denotes parameters which exceed BC FWAL guideline. FWAL guideline for arsenic not considered relevant for groundwater. *Italics* denotes parameters which exceed BC CSR DW standard. Yellow highlight denotes parameters which exceed BC CSR AW standard. "-" denotes parameter was not analysed, or a receiving water criteria was not applicable.

1. GCDWQ = Guidelines for Canadian Drinking Water Quality (Health Canada, 2025). Lowest guideline of maximum acceptable concentration or aesthetic objective is shown.
2. Approved and Working Water Quality Guidelines, Science and Information Branch, Environmental Protection Division, BC Ministry of Environment.
   Available: https://www2.gov.bc.ca/assets/gov/environment/air-land-water/water/waterquality/water-quality-guidelines/approved-wqgs/wqg_summary_aquaticlife_wildlife_agri.pdf
   Aquatic life guidelines for cadmium (dissolved), cobalt (dissolved), manganese, silver, and sulphate are based on total hardness, which varies between samples. Guideline for lead (dissolved) varies with hardness and DOC. Guidelines for aluminum and zinc (dissolved) vary with hardness, pH and DOC. Ammonia and sulphate guidelines vary with hardness, temperature, and pH.
   Values are based on average hardness of 30 mg/L, a pH of 7.6, DOC of 0 mg/L, and temperature of 10˚ C
   Phosphorus FWAL guideline for creeks from Phosphorous Management in Vancouver Island Streams. Available: https://www2.gov.bc.ca/assets/gov/environment/air-land-water/water/waterquality/water-quality-reference-documents/phosphorous_management_vi_streams_guidance_2014.pdf. BC MOE, April 2014. Monthly average of May to September samples for total phosphorus should not exceed 0.005 mg/L, and maximum total phosphorus for this period should not exceed 0.01 mg/L in any one sample. May to September results compared against stringent guideline of 0.005 mg/L.
3. Per Schedule 3.2 of the Contaminated Sites Regulation (CSR), March 2023.
   Available: https://www.bclaws.gov.bc.ca/civix/document/id/lc/statreg/375_96_08
   CSR AW standards for cadmium, copper, lead, nickel, silver and zinc are based on total hardness, which varies between samples. Likewise, CSR AW ammonia standards vary with pH. Value shown appropriate for hardness of 0 mg/L-CaCO3 and pH of 7.1.
   AW guidelines assume minimum 1:10 dilution is available. As such, samples from creeks are compared against CSR AW standards/10.
4. Dissolved copper and dissolved nickel FWAL guideline were calculated for each site using the average BC BLM software calculations between January 2020 - January 2022 with sample-specific parameters except for humic acid ratio (assumed value of 10).

TABLE B-24

INORGANIC CHEMISTRY DATA FOR CHRISTIE CREEK UPSTREAM

SAMPLE DATE	UNITS	RECEIVING WATER CRITERIA				17-Mar-25	16-Jun-25	29-Jul-24	01-Dec-25
LAB NAME		GCDWQ[1]	AQUATIC LIFE (FWAL)[2]	CSR DRINKING WATER (DW)[3]	CSR AQUATIC LIFE (AW)[3]	ALS			ALS
PHYSICAL TESTS									
pH-Field	pH	7.0 - 10.5	6.5 - 9.0	-	-	8.23			**6.91**
pH-Lab	pH	7.0 - 10.5	6.5 - 9.0	-	-	**6.93**			**6.95**
EC-Field	µS/cm	-	-	-	-	30.7	DRY	DRY	39.4
EC-Lab	µS/cm	-	-	-	-	48.6			65.9
Total Hardness ($CaCO_3$)	mg/L	-	-	-	-	21.9			27
Temperature-Field	°C	-	-	-	-	5.6			6.26
DISSOLVED ANIONS									
Alkalinity	mg CaCO3/L	-	-	-	-	22.8			27.6
Chloride	mg/L	250	150	250	1500	0.88			2.54
Sulphate	mg/L	500	128	500	1280	1.02			1.59
TOTAL CATIONS									
Calcium	mg/L	-	-	-	-	6.63			8.1
Magnesium	mg/L	-	-	-	-	1.31			1.64
Potassium	mg/L	-	-	-	-	0.19			1.16
Sodium	mg/L	200	-	200	-	1.19			1.92
TOTAL METALS									
Aluminum	mg/L	2.9	0.184	9.5	-	0.138			0.0369
Antimony	mg/L	0.006	0.074	0.006	0.09	<0.0001			<0.0001
Arsenic	mg/L	0.01	0.005	0.01	0.05	<0.0001			0.00013
Barium	mg/L	2	1	1	10	0.00247			0.00255
Beryllium	mg/L	-	0.00013	0.008	0.0015	<0.0001			<0.0001
Boron	mg/L	5	1.2	5	12	0.0105			0.026
Cadmium	mg/L	0.007	0.000081	0.005	0.0005	0.0000056			0.0000064
Chromium	mg/L	0.05	0.003	0.05	0.01	<0.0005			<0.0005
Cobalt	mg/L	-	0.00030	0.001	0.04	<0.0001			<0.0001
Copper	mg/L	1	0.0012	1.5	0.02	0.00143			0.00138
Iron	mg/L	0.1	1	6.5	-	**0.152**			0.029
Lead	mg/L	0.005	0.0033	0.01	0.16	0.0000621			<0.00005
Lithium	mg/L	-	-	0.008	-	<0.001			<0.001
Manganese	mg/L	0.02	0.72	1.5	-	0.0114			0.00391
Mercury	µg/L	1	0.02	1	0.25	<0.005			<0.005
Molybdenum	mg/L	-	7.6	0.25	10	<0.00005			<0.00005
Nickel	mg/L	-	0.0019	0.08	0.25	<0.0005			<0.0005
Selenium	mg/L	0.05	0.002	0.01	0.02	<0.00005			<0.00005
Silver	mg/L	-	0.00012	0.02	0.0005	<0.00001			<0.00001
Strontium	mg/L	7	-	2.5	-	0.0172			0.0214
Thallium	mg/L	-	-	-	0.003	<0.00001			<0.00001
Tin	mg/L	-	-	2.5	-	<0.0001			<0.0001
Titanium	mg/L	-	-	-	1	0.00901			0.00175
Tungsten	mg/L	-	-	0.003	-	<0.0001			<0.0001
Uranium	mg/L	0.02	0.0085	0.02	0.085	<0.00001			<0.00001
Vanadium	mg/L	-	-	0.02	-	0.000589			<0.0005
Zinc	mg/L	5	0.0051	3	0.075	0.0519			0.0443
NUTRIENTS									
Nitrate	mg/L as N	10	3	10	400	0.108			0.151
Ammonia Nitrogen	mg/L as N	-	1.84	-	18.4	<0.005			<0.005
Total Phosphorus	mg/L as P	-	0.005	-	-	0.0051			0.0091
POLLUTANT TESTS									
Chemical Oxygen Demand	mg/L as O	-	-	-	-	17			<10

H:\Project\1005\Analysis\Chemistry\2025\[Tables_B-14 to B-24.xlsx]Table B-24 ChristieCrk (US)

NOTES:

Bold denotes parameters which exceed GCDWQ water quality guideline. Underline denotes parameters which exceed BC FWAL guideline. FWAL guideline for arsenic not considered relevant for groundwater. *Italics* denotes parameters which exceed BC CSR DW standard. Yellow highlight denotes parameters which exceed BC CSR AW standard. "-" denotes parameter was not analysed, or a receiving water criteria was not applicable.

1. GCDWQ = Guidelines for Canadian Drinking Water Quality (Health Canada, 2025). Lowest guideline of maximum acceptable concentration or aesthetic objective is shown.
2. Approved and Working Water Quality Guidelines, Science and Information Branch, Environmental Protection Division, BC Ministry of Environment.
   Available: https://www2.gov.bc.ca/assets/gov/environment/air-land-water/water/waterquality/water-quality-guidelines/approved-wqgs/wqg_summary_aquaticlife_wildlife_agri.pdf
   Aquatic life guidelines for cadmium (dissolved), cobalt (dissolved), manganese, silver, and sulphate are based on total hardness, which varies between samples. Guideline for lead (dissolved) varies with hardness and DOC. Guidelines for aluminum and zinc (dissolved) vary with hardness, pH and DOC. Ammonia and sulphate guidelines vary with hardness, temperature, and pH.
   Values are based on average hardness of 27 mg/L, a pH of 7.4, DOC of 4.4 mg/L, and temperature of 10˚ C
   Phosphorus FWAL guideline for creeks from Phosphorous Management in Vancouver Island Streams. Available: https://www2.gov.bc.ca/assets/gov/environment/air-land-water/water/waterquality/water-quality-reference-documents/phosphorous_management_vi_streams_guidance_2014.pdf. BC MOE, April 2014. Monthly average of May to September samples for total phosphorus should not exceed 0.005 mg/L, and maximum total phosphorus for this period should not exceed 0.01 mg/L in any one sample. May to September results compared against stringent guideline of 0.005 mg/L.
3. Per Schedule 3.2 of the Contaminated Sites Regulation (CSR), March 2023.
   Available: https://www.bclaws.gov.bc.ca/civix/document/id/lc/statreg/375_96_08
   CSR AW standards for cadmium, copper, lead, nickel, silver and zinc are based on total hardness, which varies between samples. Likewise, CSR AW standards guidelines vary with pH. Value shown appropriate for hardness of 0 mg/L-CaCO3 and pH of 6.9.
   AW standards assume minimum 1:10 dilution is available. As such, samples from creeks are compared against CSR AW standards/10.
4. Dissolved copper and dissolved nickel FWAL guideline were calculated for each site using the average BC BLM software calculations between January 2020 - January 2022 with sample-specific parameters except for humic acid ratio (assumed value of 10).

TABLE B-25

INORGANIC CHEMISTRY DATA FOR MW23-1D (BEDROCK)

SAMPLE DATE		RECEIVING WATER CRITERIA				17-Mar-25	16-Jun-25	22-Sep-25	04-Dec-25
LAB NAME	UNITS	GCDWQ[1]	AQUATIC LIFE (FWAL)[2]	CSR DRINKING WATER (DW)[3]	CSR AQUATIC LIFE (AW)[3]	ALS	ALS	ALS	ALS
PHYSICAL TESTS									
pH-Field	pH	7.0 - 10.5	6.5 - 9.0	-	-	7.14	7.83	**6.56**	7.27
pH-Lab	pH	7.0 - 10.5	6.5 - 9.0	-	-	8.1	8.32	7.99	8.16
EC-Field	µS/cm	-	-	-	-	263	326	337	3097
EC-Lab	µS/cm	-	-	-	-	397	461	476	431
Dissolved Hardness ($CaCO_3$)	mg/L	-	-	-	-	168	160	173	184
Total Dissolved Solids	mg/L	500	-	-	-	278	311	312	274
Temperature-Field	°C	-	-	-	-	9	11.6	11.2	9.1
DISSOLVED ANIONS									
Alkalinity	mg/L $CaCO_3$	-	-	-	-	221	251	265	242
Chloride	mg/L	250	150	250	1500	4.37	9.14	4.52	4.16
Sulphate	mg/L	500	309	500	3090	1.81	1.13	0.3	<0.3
DISSOLVED CATIONS									
Calcium	mg/L	-	-	-	-	46.8	46.2	49.4	52
Magnesium	mg/L	-	-	-	-	12.3	10.8	12	13.1
Potassium	mg/L	-	-	-	-	0.929	5.51	1.59	0.835
Sodium	mg/L	200	-	200	-	27.3	32.5	47.4	25.2
DISSOLVED METALS									
Aluminum	mg/L	2.9	0.329	9.5	-	0.0023	0.0052	0.0017	0.0011
Antimony	mg/L	0.006	0.074	0.006	0.09	0.00018	<0.0001	<0.0001	<0.0001
Arsenic	mg/L	0.01	0.005	0.01	0.05	0.00143	0.00324	0.00382	0.00332
Barium	mg/L	2	1	1	10	0.0574	0.0761	0.0896	0.0765
Beryllium	mg/L	-	0.00013	0.008	0.0015	<0.0001	<0.0001	<0.0001	<0.0001
Boron	mg/L	5	1.2	5	12	0.64	0.755	0.748	0.735
Cadmium	mg/L	0.007	0.00026	0.005	0.0025	<0.000005	0.0000093	<0.000005	<0.000005
Chromium	mg/L	0.05	0.003	0.05	0.01	<0.0005	<0.0005	<0.0005	<0.0005
Cobalt	mg/L	-	0.00057	0.001	0.04	<0.0001	0.00026	<0.0001	<0.0001
Copper	mg/L	1	0.0027	1.5	0.06	0.00028	0.00037	<0.0002	<0.0002
Iron	mg/L	0.1	0.35	6.5	-	0.011	**0.138**	0.089	0.01
Lead	mg/L	0.005	0.0050	0.01	0.16	<0.00005	<0.00005	<0.00005	<0.00005
Lithium	mg/L	-	-	0.008	-	0.0067	0.0065	*0.0089*	0.0068
Manganese	mg/L	0.02	1.19	1.5	-	**0.286**	**0.546**	**0.58**	**0.594**
Mercury	µg/L	1	0.02	1	0.25	<0.005	0.0118	<0.005	<0.005
Molybdenum	mg/L	-	7.6	0.25	10	0.00602	0.00678	0.00536	0.00444
Nickel	mg/L	-	0.0063	0.08	1.10	0.00108	0.00089	<0.0005	<0.0005
Selenium	mg/L	0.05	0.002	0.01	0.02	0.000066	<0.00005	0.000085	0.00007
Silver	mg/L	-	0.00012	0.02	0.0150	<0.00001	<0.00001	<0.00001	<0.00001
Strontium	mg/L	7	-	2.5	-	0.415	0.406	0.468	0.447
Thallium	mg/L	-	-	-	0.003	<0.00001	<0.00001	<0.00001	<0.00001
Tin	mg/L	-	-	2.5	-	0.00013	0.00104	<0.0001	<0.0001
Titanium	mg/L	-	-	-	1	<0.0003	<0.0003	<0.0003	<0.0003
Tungsten	mg/L	-	-	0.003	-	0.00014	0.00014	<0.0001	<0.0001
Uranium	mg/L	0.02	0.0085	0.02	0.085	0.000265	0.000118	0.000446	0.000147
Vanadium	mg/L	-	-	0.02	-	<0.0005	<0.0005	<0.0005	<0.0005
Zinc	mg/L	5	0.017	3	0.900	0.0012	0.0016	<0.001	<0.001
NUTRIENTS									
Nitrate	mg/L as N	10	3	10	400	<0.005	<0.005	<0.005	<0.005
Ammonia Nitrogen	mg/L as N	-	1.84	-	3.7	0.0076	0.0916	0.0536	0.041
POLLUTANT TESTS									
Chemical Oxygen Demand	mg/L as O	-	-	-	-	21	34	22	42

H:\Project\1005\Analysis\Chemistry\2025\[Tables_B-25 to B-28.xlsx]Table B-25 MW23-1D

NOTES:

Bold denotes parameters which exceed GCDWQ water quality guideline. Underline denotes parameters which exceed BC FWAL guideline. FWAL guideline for arsenic not considered relevant for groundwater. *Italics* denotes parameters which exceed BC CSR DW standard. Yellow highlight denotes parameters which exceed BC CSR AW standard. "-" denotes parameter was not analysed, or a receiving water criteria was not applicable.

1. GCDWQ = Guidelines for Canadian Drinking Water Quality (Health Canada, 2025). Lowest guideline of maximum acceptable concentration or aesthetic objective is shown.
2. Approved and Working Water Quality Guidelines, Science and Information Branch, Environmental Protection Division, BC Ministry of Environment. Available: https://www2.gov.bc.ca/assets/gov/environment/air-land-water/water/waterquality/water-quality-guidelines/approved-wqgs/wqg_summary_aquaticlife_wildlife_agri.pdf
   Aquatic life guidelines for cadmium (dissolved), cobalt (dissolved), manganese, silver, and sulphate are based on total hardness, which varies between samples. Guideline for lead (dissolved) varies with hardness and DOC. Guidelines for aluminum and zinc (dissolved) vary with hardness, pH and DOC. Ammonia and sulphate guidelines vary with hardness, temperature, and pH.
   Values are based on average hardness of 133 mg/L, a pH of 7.8, DOC of 5 mg/L, and temperature of 10˚ C
3. Per Schedule 3.2 of the Contaminated Sites Regulation (CSR), March 2023. Available: https://www.bclaws.gov.bc.ca/civix/document/id/lc/statreg/375_96_08
   CSR AW standards for cadmium, copper, lead, nickel, silver and zinc are based on total hardness, which varies between samples.
   Likewise, CSR AW ammonia standards vary with pH. Value shown appropriate for hardness of 133 mg/L-CaCO3 and pH of 7.1.
4. Dissolved copper and dissolved nickel FWAL guideline was calculated with BC BLM software with sample-specific parameters except for humic acid ratio (assumed value of 10) and DOC (assumed value of 5).

TABLE B-26

INORGANIC CHEMISTRY DATA FOR MW23-1S (SURFICIAL)

SAMPLE DATE	UNITS	RECEIVING WATER CRITERIA				17-Mar-25	16-Jun-25	22-Sep-25	04-Dec-25
LAB NAME		GCDWQ[1]	AQUATIC LIFE (FWAL)[2]	CSR DRINKING WATER (DW)[3]	CSR AQUATIC LIFE (AW)[3]	ALS	ALS	ALS	ALS
PHYSICAL TESTS									
pH-Field	pH	7.0 - 10.5	6.5 - 9.0	-	-	**6.94**	8.01	**6.23**	7.14
pH-Lab	pH	7.0 - 10.5	6.5 - 9.0	-	-	7.37	8.07	7.44	7.83
EC-Field	µS/cm	-	-	-	-	265	331.7	499	24
EC-Lab	µS/cm	-	-	-	-	417	485	693	452
Dissolved Hardness ($CaCO_3$)	mg/L	-	-	-	-	199	218	284	219
Total Dissolved Solids	mg/L	500	-	-	-	266	310	397	267
Temperature-Field	°C	-	-	-	-	7.7	11.7	15.7	9.6
DISSOLVED ANIONS									
Alkalinity	mg/L $CaCO_3$	-	-	-	-	228	268	299	241
Chloride	mg/L	250	150	250	1500	2.7	4.58	42	9.03
Sulphate	mg/L	500	429	500	4290	0.8	1.43	2.61	1.88
DISSOLVED CATIONS									
Calcium	mg/L	-	-	-	-	62	70.7	92.9	71.8
Magnesium	mg/L	-	-	-	-	10.7	10.2	12.7	9.66
Potassium	mg/L	-	-	-	-	0.457	1.23	32.9	0.797
Sodium	mg/L	200	-	200	-	13	14	15.7	12.3
DISSOLVED METALS									
Aluminum	mg/L	2.9	0.257	9.5	-	0.0027	0.142	0.0036	0.0012
Antimony	mg/L	0.006	0.074	0.006	0.09	<0.0001	<0.0001	<0.0001	<0.0001
Arsenic	mg/L	0.01	0.005	0.01	0.05	0.00014	0.0003	0.0002	0.00013
Barium	mg/L	2	1	1	10	0.0167	0.0272	0.0302	0.0158
Beryllium	mg/L	-	0.00013	0.008	0.0015	<0.0001	<0.0001	<0.0001	<0.0001
Boron	mg/L	5	1.2	5	12	0.136	0.168	0.168	0.163
Cadmium	mg/L	0.007	0.00037	0.005	0.0040	0.0000291	0.0000246	0.0000456	0.0000101
Chromium	mg/L	0.05	0.003	0.05	0.01	<0.0005	0.0005	<0.0005	<0.0005
Cobalt	mg/L	-	0.00070	0.001	0.04	0.00034	0.00066	*0.00108*	<0.0001
Copper	mg/L	1	0.00070	1.5	0.09	0.00091	0.00133	0.00128	0.00066
Iron	mg/L	0.1	0.35	6.5	-	<0.01	**0.291**	<0.01	<0.01
Lead	mg/L	0.005	0.0056	0.01	0.16	<0.00005	<0.00005	<0.00005	<0.00005
Lithium	mg/L	-	-	0.008	-	<0.001	<0.001	<0.001	<0.001
Manganese	mg/L	0.02	1.55	1.5	-	***2.44***	***2.3***	***4.91***	**0.0464**
Mercury	µg/L	1	0.02	1	0.25	<0.005	0.0264	<0.005	<0.005
Molybdenum	mg/L	-	7.6	0.25	10	0.000493	0.00172	0.000303	0.000195
Nickel	mg/L	-	0.0080	0.08	1.50	0.00082	0.00139	0.00146	<0.0005
Selenium	mg/L	0.05	0.002	0.01	0.02	<0.00005	<0.00005	<0.00005	<0.00005
Silver	mg/L	-	0.00012	0.02	0.0150	<0.00001	<0.00001	<0.00001	<0.00001
Strontium	mg/L	7	-	2.5	-	0.109	0.136	0.174	0.116
Thallium	mg/L	-	-	-	0.003	<0.00001	<0.00001	0.000011	<0.00001
Tin	mg/L	-	-	2.5	-	<0.0001	<0.0001	<0.0001	<0.0001
Titanium	mg/L	-	-	-	1	<0.0003	0.0156	<0.0003	<0.0003
Tungsten	mg/L	-	-	0.003	-	<0.0001	<0.0001	<0.0001	<0.0001
Uranium	mg/L	0.02	0.0085	0.02	0.085	0.000092	0.000155	0.000152	0.000102
Vanadium	mg/L	-	-	0.02	-	<0.0005	0.00105	<0.0005	<0.0005
Zinc	mg/L	5	0.043	3	1.650	0.0011	0.0022	0.0019	<0.001
NUTRIENTS									
Nitrate	mg/L as N	10	3	10	400	0.164	0.447	1.23	0.598
Ammonia Nitrogen	mg/L as N	-	1.84	-	18.5	0.269	0.529	0.54	0.0994
POLLUTANT TESTS									
Chemical Oxygen Demand	mg/L as O	-	-	-	-	24	13	13	<10

H:\Project\1005\Analysis\Chemistry\2025\[Tables_B-25 to B-28.xlsx]Table B-26 MW23-1S

NOTES:

Bold denotes parameters which exceed GCDWQ water quality guideline. Underline denotes parameters which exceed BC FWAL guideline. FWAL guideline for arsenic not considered relevant for groundwater. *Italics* denotes parameters which exceed BC CSR DW standard. Yellow highlight denotes parameters which exceed BC CSR AW standard. "-" denotes parameter was not analysed, or a receiving water criteria was not applicable.

1. GCDWQ = Guidelines for Canadian Drinking Water Quality (Health Canada, 2025). Lowest guideline of maximum acceptable concentration or aesthetic objective is shown.
2. Approved and Working Water Quality Guidelines, Science and Information Branch, Environmental Protection Division, BC Ministry of Environment. Available: https://www2.gov.bc.ca/assets/gov/environment/air-land-water/water/waterquality/water-quality-guidelines/approved-wqgs/wqg_summary_aquaticlife_wildlife_agri.pdf
   Aquatic life guidelines for cadmium (dissolved), cobalt (dissolved), manganese, silver, and sulphate are based on total hardness, which varies between samples. Guideline for lead (dissolved) varies with hardness and DOC. Guidelines for aluminum and zinc (dissolved) vary with hardness, pH and DOC. Ammonia and sulphate guidelines vary with hardness, temperature, and pH.
   Values are based on average hardness of 214 mg/L, a pH of 7.2, DOC of 5 mg/L, and temperature of 10° C
3. Per Schedule 3.2 of the Contaminated Sites Regulation (CSR), March 2023. Available: https://www.bclaws.gov.bc.ca/civix/document/id/lc/statreg/375_96_08
   CSR AW standards for cadmium, copper, lead, nickel, silver and zinc are based on total hardness, which varies between samples.
   Likewise, CSR AW ammonia standards vary with pH. Value shown appropriate for hardness of 214 mg/L-CaCO3 and pH of 6.9.
4. Dissolved copper and dissolved nickel FWAL guideline was calculated with BC BLM software with sample-specific parameters except for humic acid ratio (assumed value of 10) and DOC (assumed value of 5).

TABLE B-27

INORGANIC CHEMISTRY DATA FOR MW23-2 (SURFICIAL)

SAMPLE DATE	UNITS	RECEIVING WATER CRITERIA				18-Mar-25	17-Jun-25	17-Sep-25	02-Dec-25
LAB NAME		GCDWQ[1]	AQUATIC LIFE (FWAL)[2]	CSR DRINKING WATER (DW)[3]	CSR AQUATIC LIFE (AW)[3]	ALS	ALS	ALS	ALS
PHYSICAL TESTS									
pH-Field	pH	7.0 - 10.5	6.5 - 9.0	-	-	7.2	**6.59**	8.41	7.93
pH-Lab	pH	7.0 - 10.5	6.5 - 9.0	-	-	**6.99**	**6.97**	7.1	**6.52**
EC-Field	µS/cm	-	-	-	-	61.7	65.6	75.4	68.1
EC-Lab	µS/cm	-	-	-	-	97.4	98.2	104	99.1
Dissolved Hardness ($CaCO_3$)	mg/L	-	-	-	-	42.2	41.5	45.6	41.4
Total Dissolved Solids	mg/L	500	-	-	-	82	82	76	79
Temperature-Field	°C	-	-	-	-	8.6	9.3	11.4	8.2
DISSOLVED ANIONS									
Alkalinity	mg/L $CaCO_3$	-	-	-	-	48.5	48.3	51.6	45.1
Chloride	mg/L	250	150	250	1500	1.49	1.2	1.86	1.79
Sulphate	mg/L	500	218	500	2180	1.93	1.82	2.33	1.7
DISSOLVED CATIONS									
Calcium	mg/L	-	-	-	-	12.4	12	13.3	12.3
Magnesium	mg/L	-	-	-	-	2.74	2.8	3.01	2.59
Potassium	mg/L	-	-	-	-	0.09	0.075	0.227	0.204
Sodium	mg/L	200	-	200	-	2.76	2.88	3.07	3.73
DISSOLVED METALS									
Aluminum	mg/L	2.9	0.140	9.5	-	0.0027	0.0054	0.0034	0.0062
Antimony	mg/L	0.006	0.074	0.006	0.09	<0.0001	<0.0001	<0.0001	<0.0001
Arsenic	mg/L	0.01	0.005	0.01	0.05	<0.0001	<0.0001	<0.0001	<0.0001
Barium	mg/L	2	1	1	10	0.00238	0.00206	0.00221	0.00234
Beryllium	mg/L	-	0.00013	0.008	0.0015	<0.0001	<0.0001	<0.0001	<0.0001
Boron	mg/L	5	1.2	5	12	0.021	0.032	0.045	0.051
Cadmium	mg/L	0.007	0.00014	0.005	0.0015	<0.000005	<0.000005	<0.000005	0.0000058
Chromium	mg/L	0.05	0.003	0.05	0.01	<0.0005	<0.0005	<0.0005	<0.0005
Cobalt	mg/L	-	0.00040	0.001	0.04	<0.0001	<0.0001	<0.0001	<0.0001
Copper	mg/L	1	0.00040	1.5	0.03	0.0006	0.0024	0.00036	0.00024
Iron	mg/L	0.1	0.35	6.5	-	<0.01	<0.01	<0.01	<0.01
Lead	mg/L	0.005	0.0042	0.01	0.16	<0.00005	0.000074	<0.00005	<0.00005
Lithium	mg/L	-	-	0.008	-	<0.001	<0.001	<0.001	<0.001
Manganese	mg/L	0.02	0.86	1.5	-	0.00145	0.00381	0.00199	0.00189
Mercury	µg/L	1	0.02	1	0.25	<0.005	0.053	<0.005	0.0139
Molybdenum	mg/L	-	7.6	0.25	10	<0.00005	0.000057	<0.00005	<0.00005
Nickel	mg/L	-	0.0020	0.08	0.25	<0.0005	<0.0005	<0.0005	<0.0005
Selenium	mg/L	0.05	0.002	0.01	0.02	<0.00005	<0.00005	<0.00005	<0.00005
Silver	mg/L	-	0.00012	0.02	0.0005	<0.00001	<0.00001	<0.00001	<0.00001
Strontium	mg/L	7	-	2.5	-	0.0279	0.0282	0.0296	0.0283
Thallium	mg/L	-	-	-	0.003	<0.00001	<0.00001	<0.00001	<0.00001
Tin	mg/L	-	-	2.5	-	<0.0001	<0.0001	<0.0001	<0.0001
Titanium	mg/L	-	-	-	1	<0.0003	<0.0003	<0.0003	<0.0003
Tungsten	mg/L	-	-	0.003	-	<0.0001	<0.0001	<0.0001	<0.0001
Uranium	mg/L	0.02	0.0085	0.02	0.085	<0.00001	<0.00001	<0.00001	<0.00001
Vanadium	mg/L	-	-	0.02	-	0.00055	0.00074	0.00061	0.00059
Zinc	mg/L	5	0.017	3	0.075	<0.001	0.0018	<0.001	0.0011
NUTRIENTS									
Nitrate	mg/L as N	10	3	10	400	0.0762	0.0904	0.0876	0.364
Ammonia Nitrogen	mg/L as N	-	1.84	-	18.4	<0.005	<0.005	<0.005	<0.005
POLLUTANT TESTS									
Chemical Oxygen Demand	mg/L as O	-	-	-	-	11	<10	<10	<10

H:\Project\1005\Analysis\Chemistry\2025\[Tables_B-25 to B-28.xlsx]Table B-27 MW23-2

NOTES:

Bold denotes parameters which exceed GCDWQ water quality guideline. Underline denotes parameters which exceed BC FWAL guideline. FWAL guideline for arsenic not considered relevant for groundwater. *Italics* denotes parameters which exceed BC CSR DW standard. Yellow highlight denotes parameters which exceed BC CSR AW standard. "-" denotes parameter was not analysed, or a receiving water criteria was not applicable.

1. GCDWQ = Guidelines for Canadian Drinking Water Quality (Health Canada, 2025). Lowest guideline of maximum acceptable concentration or aesthetic objective is shown.
2. Approved and Working Water Quality Guidelines, Science and Information Branch, Environmental Protection Division, BC Ministry of Environment. Available: https://www2.gov.bc.ca/assets/gov/environment/air-land-water/water/waterquality/water-quality-guidelines/approved-wqgs/wqg_summary_aquaticlife_wildlife_agri.pdf
   Aquatic life guidelines for cadmium (dissolved), cobalt (dissolved), manganese, silver, and sulphate are based on total hardness, which varies between samples. Guideline for lead (dissolved) varies with hardness and DOC. Guidelines for aluminum and zinc (dissolved) vary with hardness, pH and DOC. Ammonia and sulphate guidelines vary with hardness, temperature, and pH.
   Values are based on average hardness of 57 mg/L, a pH of 6.8, DOC of 5 mg/L, and temperature of 10˚ C
3. Per Schedule 3.2 of the Contaminated Sites Regulation (CSR), March 2023. Available: https://www.bclaws.gov.bc.ca/civix/document/id/lc/statreg/375_96_08
   CSR AW standards for cadmium, copper, lead, nickel, silver and zinc are based on total hardness, which varies between samples.
   Likewise, CSR AW ammonia standards vary with pH. Value shown appropriate for hardness of 57 mg/L-CaCO3 and pH of 7.2.
4. Dissolved copper and dissolved nickel FWAL guideline was calculated with BC BLM software with sample-specific parameters except for humic acid ratio (assumed value of 10) and DOC (assumed value of 5).

TABLE B-28
DOMESTIC WELLS SAMPLED SEPTEMBER 15, 2025

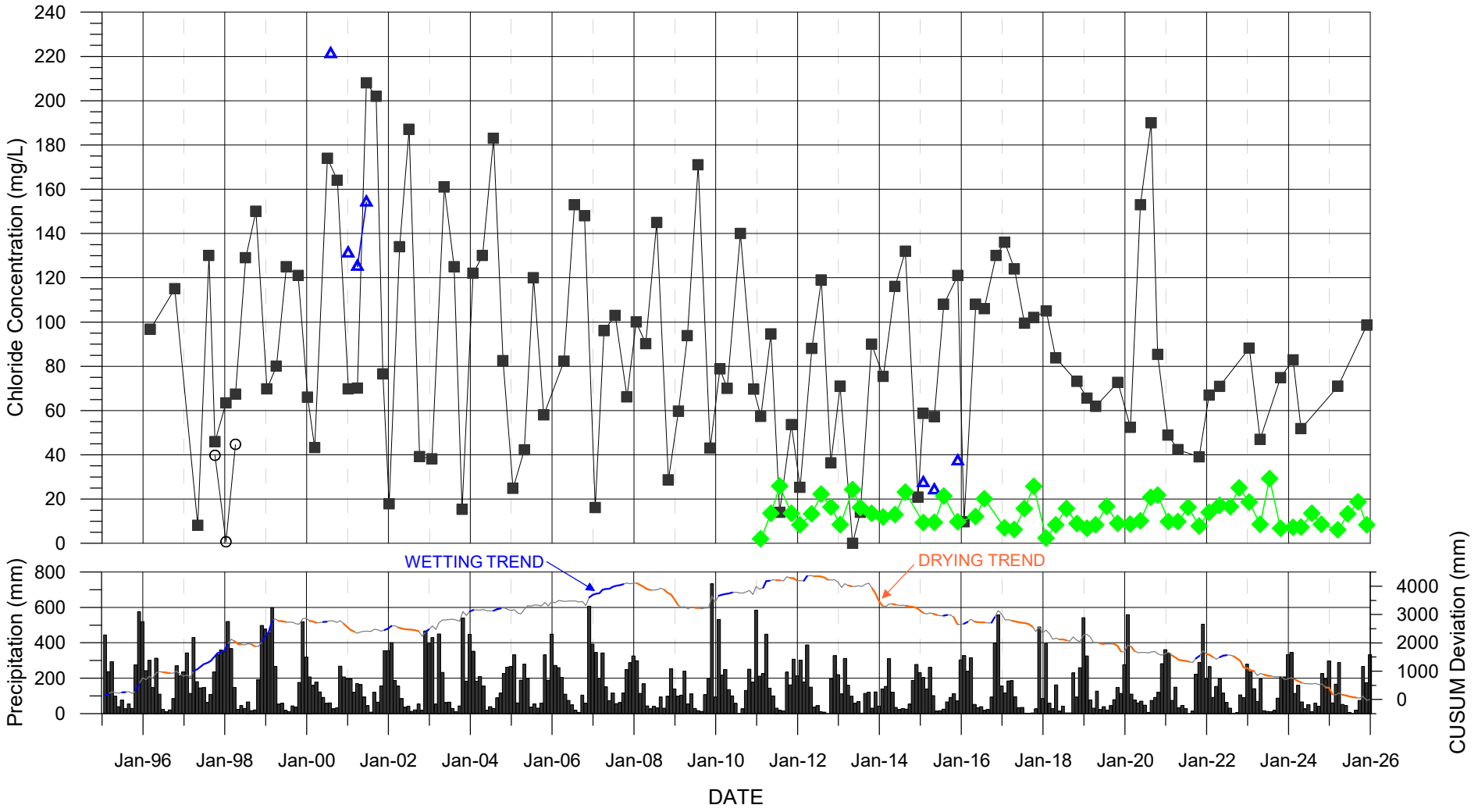
PARAMETER	UNITS	RECEIVING WATER CRITERIA		DW-A	DW-B	DW-C	DW-D	DW-E	DW-F
		GCDWQ MAC or AO[3]	CSR DRINKING WATER (DW)[4]	1996	1958	1988	1978	1978	1979
				95 ft	16 ft	<20 ft	20 ft	16 ft	17 ft
				ALS	ALS	ALS	ALS	ALS	ALS
PHYSICAL TESTS									
pH - Field	pH	7.0 - 10.5	-	7.2	**6.2**	**6.25**	**6.31**	**6.42**	**6.49**
pH - Lab	pH	7.0 - 10.5	-	8.87	8.01	7.39	7.24	7.48	7.79
Conductivity - Field	µS/cm	-	-	1790	201	91	57	137	104
Conductivity - Lab	µS/cm	-	-	2240	223	138	76.6	165	128
Total Hardness ($CaCO_3$)	mg/L	-	-	40	114	68	33.5	79.3	62.4
Total Dissolved Solids	mg/L	500	-	**1160**	173	99	66	122	95
DISSOLVED ANIONS									
Alkalinity - Total	mg/L $CaCO_3$	-	-	82.6	118	71.7	39.2	77	65.9
Chloride	mg/L	250	250	**638**	2.09	0.77	0.8	6.32	1.52
Sulphate	mg/L	500	500	73.2	2.82	1.1	0.79	1.51	0.77
TOTAL CATIONS									
Calcium	mg/L	-	-	15.6	31.4	22.2	10.7	21.9	17.8
Magnesium	mg/L	-	-	0.253	8.76	3.04	1.65	5.98	4.35
Potassium	mg/L	-	-	1.64	0.237	0.326	0.166	0.182	0.135
Sodium	mg/L	200	200	**469**	4.46	3.68	2.84	4.16	3.17
NUTRIENTS									
Nitrate Nitrogen	mg/L as N	10	10	0.129	0.16	0.397	0.166	0.198	0.151
TOTAL METALS									
Aluminum	mg/L	2.9	9.5	0.0314	0.0045	0.0732	0.0444	0.0049	0.0112
Antimony	mg/L	0.006	0.006	<0.0005	0.00011	<0.0001	<0.0001	<0.0001	<0.0001
Arsenic	mg/L	0.010	0.010	**0.012**	0.00139	0.00046	0.00012	<0.0001	0.00016
Barium	mg/L	2	1	0.0208	0.00386	0.00634	0.00213	0.00052	0.00173
Beryllium	mg/L	-	0.008	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Boron	mg/L	5	5	**12**	0.016	0.012	<0.01	0.019	0.015
Cadmium	mg/L	0.007	0.005	<0.000025	<0.000005	0.000016	<0.000005	<0.000005	<0.000005
Chromium	mg/L	0.05	0.05	<0.0025	0.00168	<0.0005	<0.0005	<0.0005	0.00158
Cobalt	mg/L	-	0.001	<0.0005	<0.0001	0.00019	<0.0001	<0.0001	<0.0001
Copper	mg/L	1.0	1.5	<0.0025	0.0156	0.00242	0.00516	0.00578	0.00622
Iron	mg/L	0.1	6.5	<0.05	<0.01	0.054	0.033	<0.01	<0.01
Lead	mg/L	0.005	0.010	<0.00025	0.000814	<0.00005	0.000055	0.000596	0.00021
Lithium	mg/L	-	0.008	0.335	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese	mg/L	0.02	1.5	0.0017	0.00023	0.24	0.00854	0.00106	0.00215
Mercury	µg/L	1.00	1.00	<0.005	<0.005	0.0131	<0.005	<0.005	<0.005
Molybdenum	mg/L	-	0.25	0.0024	0.000206	0.000175	<0.00005	<0.00005	0.000086
Nickel	mg/L	-	0.08	<0.0025	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Selenium	mg/L	0.05	0.01	<0.00025	0.00015	<0.00005	<0.00005	<0.00005	<0.00005
Silver	mg/L	-	0.02	<0.00005	0.000025	<0.00001	<0.00001	<0.00001	<0.00001
Strontium	mg/L	7	2.5	0.29	0.0563	0.0461	0.0286	0.0435	0.0362
Thallium	mg/L	-	-	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Tin	mg/L	-	2.5	<0.0005	0.00028	<0.0001	<0.0001	<0.0001	<0.0001
Titanium	mg/L	-	-	<0.0015	<0.0003	0.00436	0.00219	<0.0003	0.00046
Tungsten	mg/L	-	0.003	0.0324	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Uranium	mg/L	0.02	0.02	<0.00005	0.000045	0.000014	<0.00001	0.000028	0.000017
Vanadium	mg/L	-	0.02	<0.0025	0.00258	0.00228	0.00083	0.00057	0.00168
Zinc	mg/L	5	3	<0.015	0.014	<0.003	<0.003	0.009	<0.003

H:\Project\1005\Analysis\Chemistry\2025\[Tables_B-25 to B-28.xlsx]Table B-28 Domestic Wells

NOTES:
1. **Bolding** denotes parameters which exceed GCDWQ water quality criteria, and yellow highlight denotes parameters exceeding the CSR DW criteria.
2. "-" denotes parameter was not analysed, or a receiving water criteria was not applicable.
3. GCDWQ = Guidelines for Canadian Drinking Water Quality (Health Canada, 2025)
   MAC = Maximum acceptable concentration; AO = Aesthetic objective.
4. Per Schedule 3.2 of the Contaminated Sites Regulation (CSR), March 2023.
Available: https://www.bclaws.gov.bc.ca/civix/document/id/lc/statreg/375_96_08

APPENDIX B - LIST OF FIGURES

H:\Project\1005\Analysis\Chemistry\2025\1-LAGIN_CL.GRF



- Leachate (Lagoon Inlet)
- Surge Lagoon
- BH00-1C (Landfill Well)
- South Expansion Leachate Drain

Note:
1. Precipitation measured at Environment Canada's Robertson Creek (1995-2018) and Port Alberni (AUT) (2018-present) stations.

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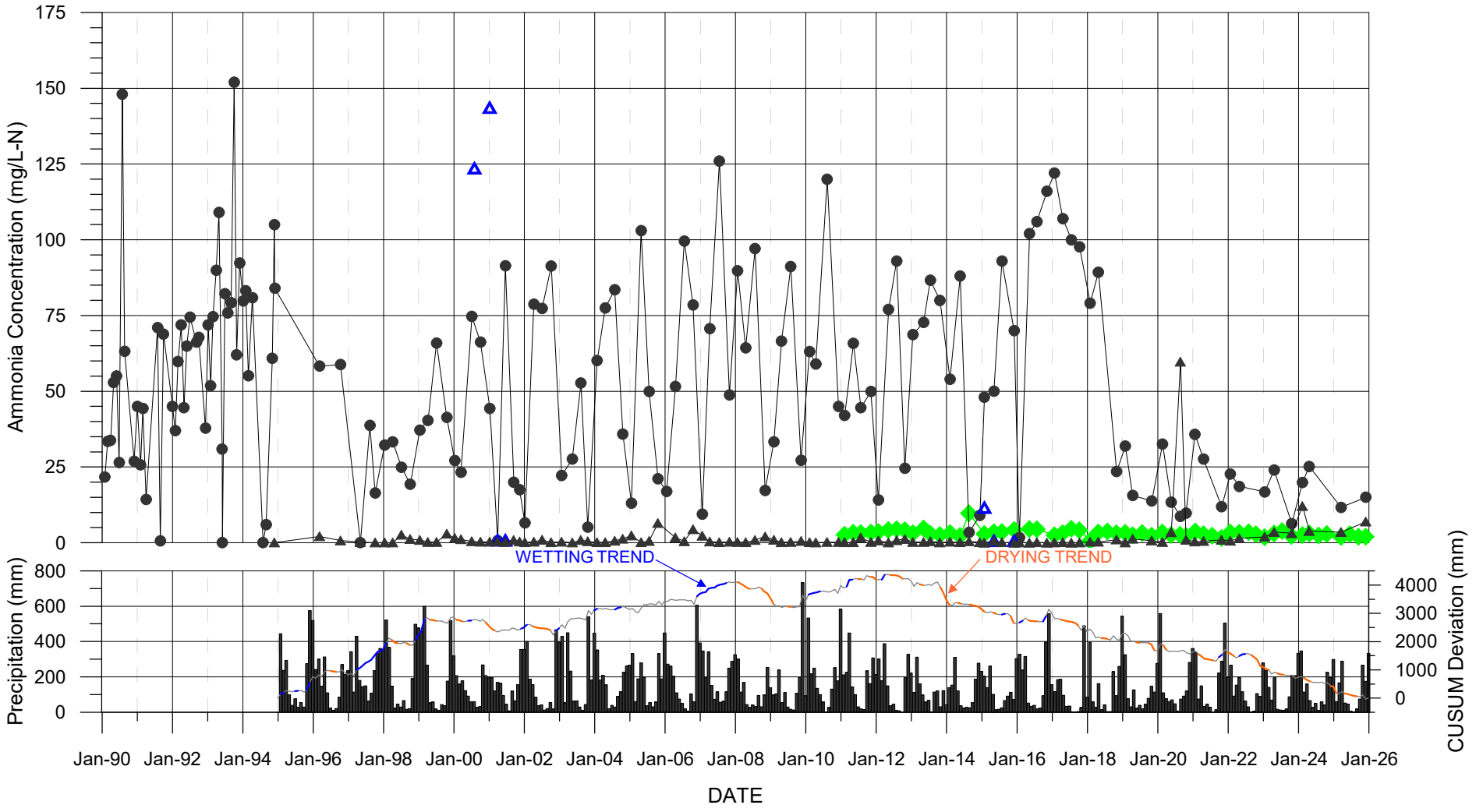
CHLORIDE CONCENTRATION TIME-SERIES PLOT FOR LEACHATE

BY:	DATE:
SC	MAR 26
APPROVED:	FIG:
JM	B-1

H:\Project\1005\Analysis\Chemistry\2025\2-LAGIN_N.GRF



- Leachate (Lagoon Inlet)
- Leachate (Lagoon Inlet, Nitrate)
- BH00-1C
- South Expansion Leachate Drain

Note:
1. Precipitation measured at Environment Canada's Robertson Creek (1995-2018) and Port Alberni (AUT) (2018-present) stations.

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AMMONIA CONCENTRATION TIME-SERIES PLOT FOR LEACHATE

BY:	DATE:
SC	MAR 26
APPROVED:	FIG:
JM	B-2

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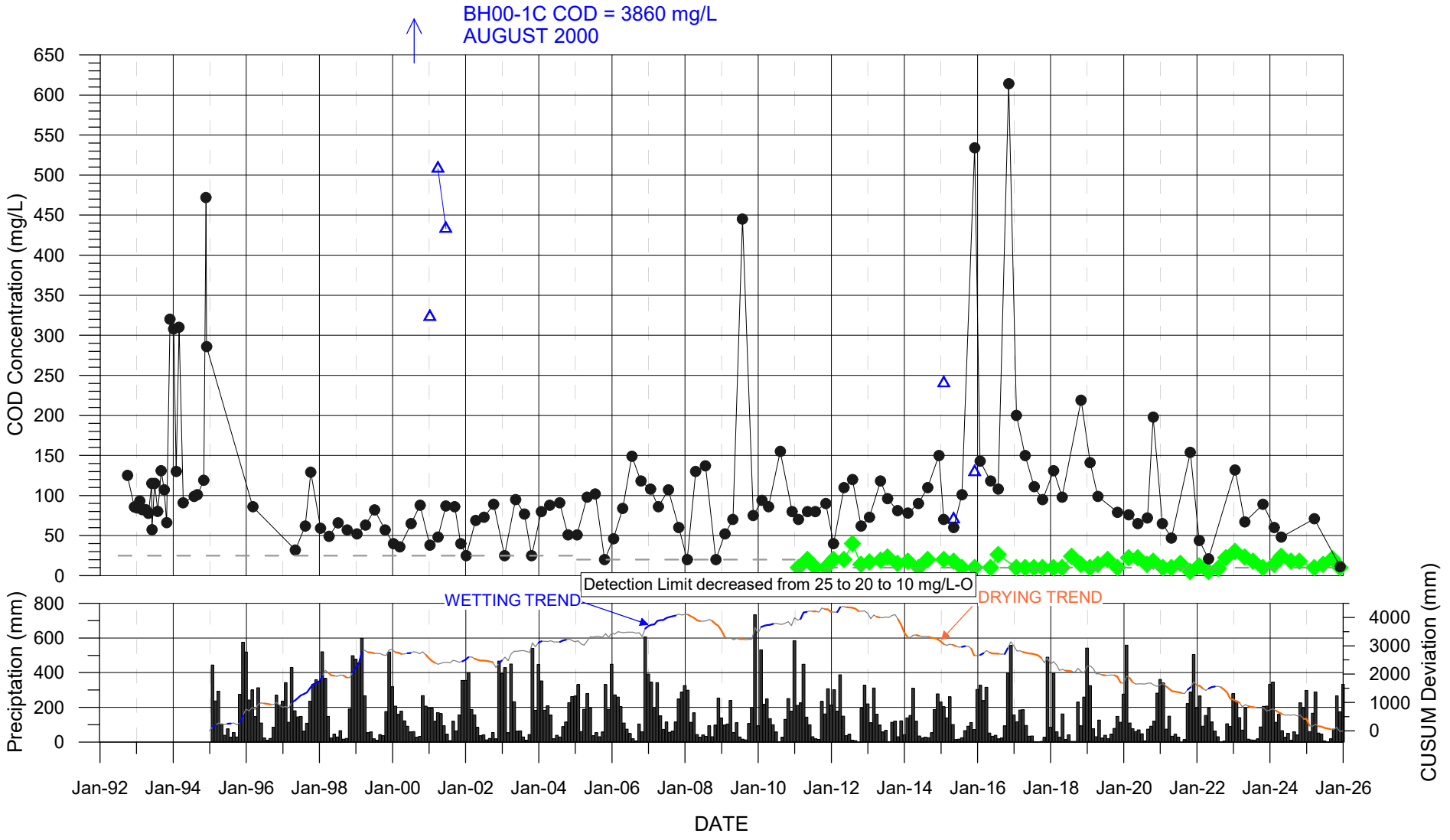

- Leachate (Lagoon Inlet)
- BH00-1C (Landfill Well)
- South Expansion Leachate Drain

Note:
1. Precipitation measured at Environment Canada's Robertson Creek (1995-2018) and Port Alberni (AUT) (2018-present) stations.

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COD CONCENTRATION TIME-SERIES PLOT FOR LEACHATE

BY:	DATE:
SC	MAR 26
APPROVED:	FIG:
JM	B-3

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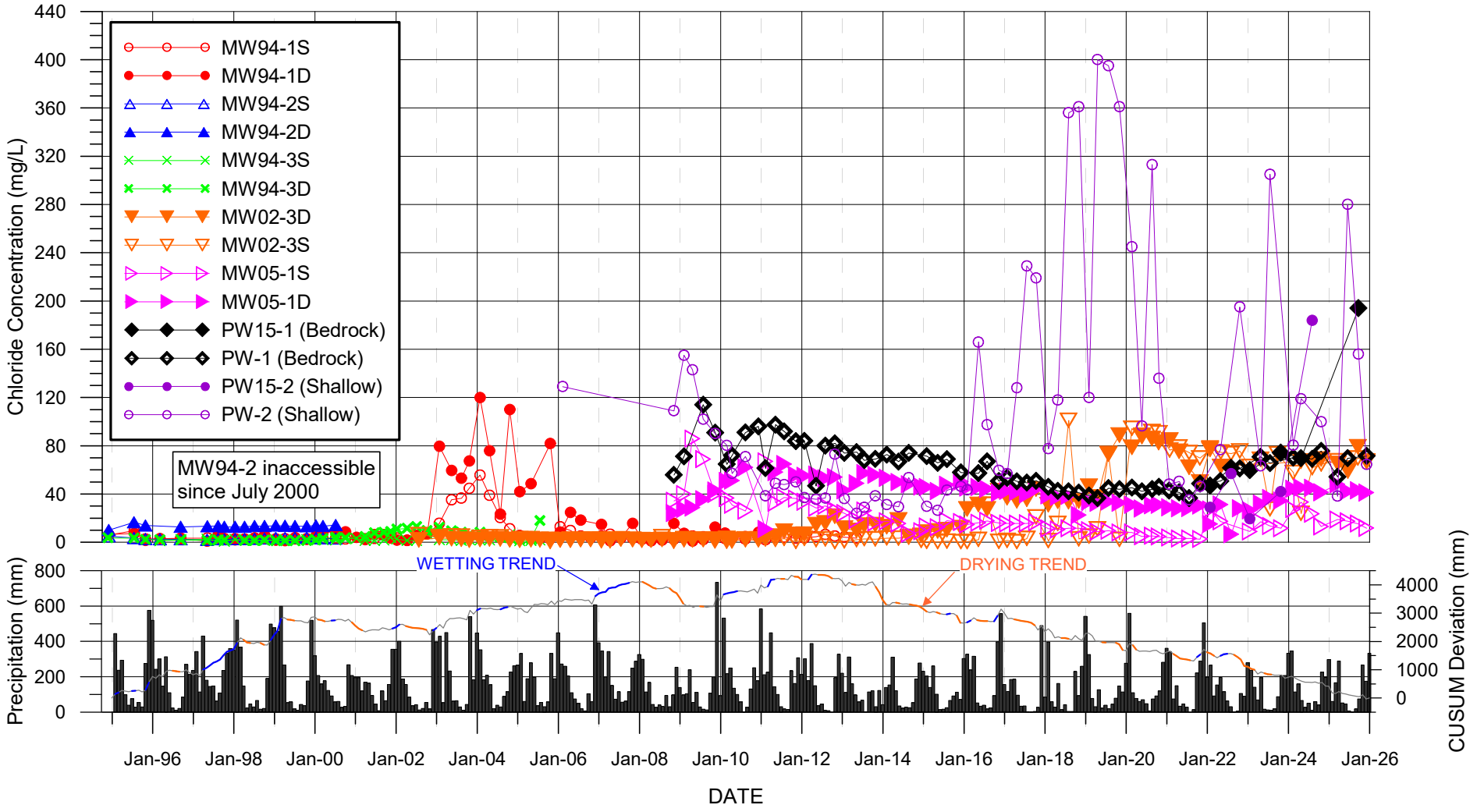

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CHLORIDE CONCENTRATION TIME-SERIES PLOT FOR SOUTHEAST WELLS MW94-1, MW94-2, MW94-3, MW02-3, MW05-1, PW-1, PW15-1, PW-2 AND PW15-2

BY:	DATE:
SC	MAR 26
APPROVED:	FIG:
JM	B-4

Note:
1. Precipitation measured at Environment Canada's Robertson Creek (1995-2018) and Port Alberni (AUT) (2018-present) stations.

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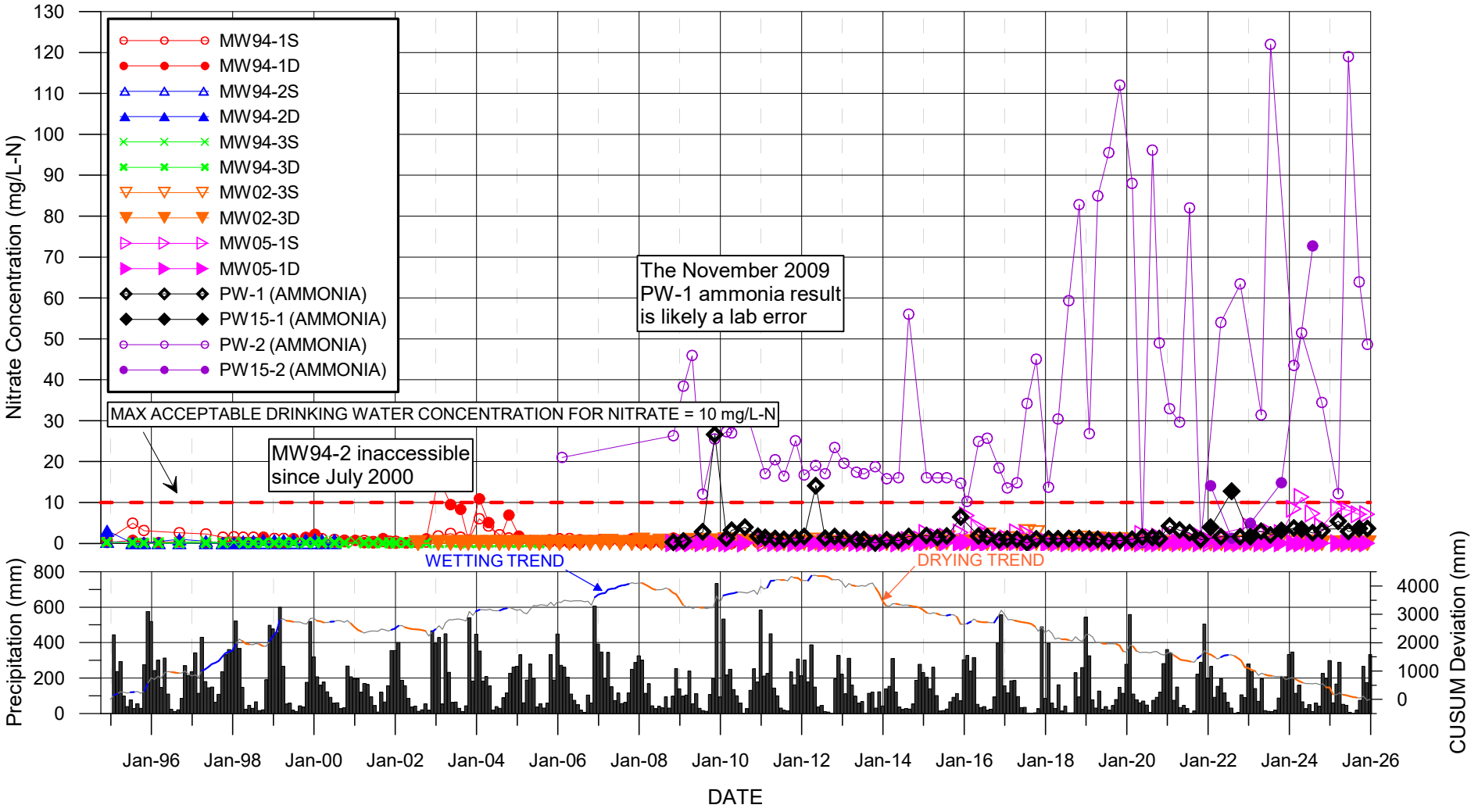

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NITROGEN CONCENTRATION TIME-SERIES PLOT FOR SOUTHEAST WELLS MW94-1, MW94-2, MW94-3, MW02-3, MW05-1, PW-1, PW15-1, PW-2 AND PW15-2

BY:	DATE:
SC	MAR 26
APPROVED:	FIG:
JM	B-5

Note:
1. Precipitation measured at Environment Canada's Robertson Creek (1995-2018) and Port Alberni (AUT) (2018-present) stations.

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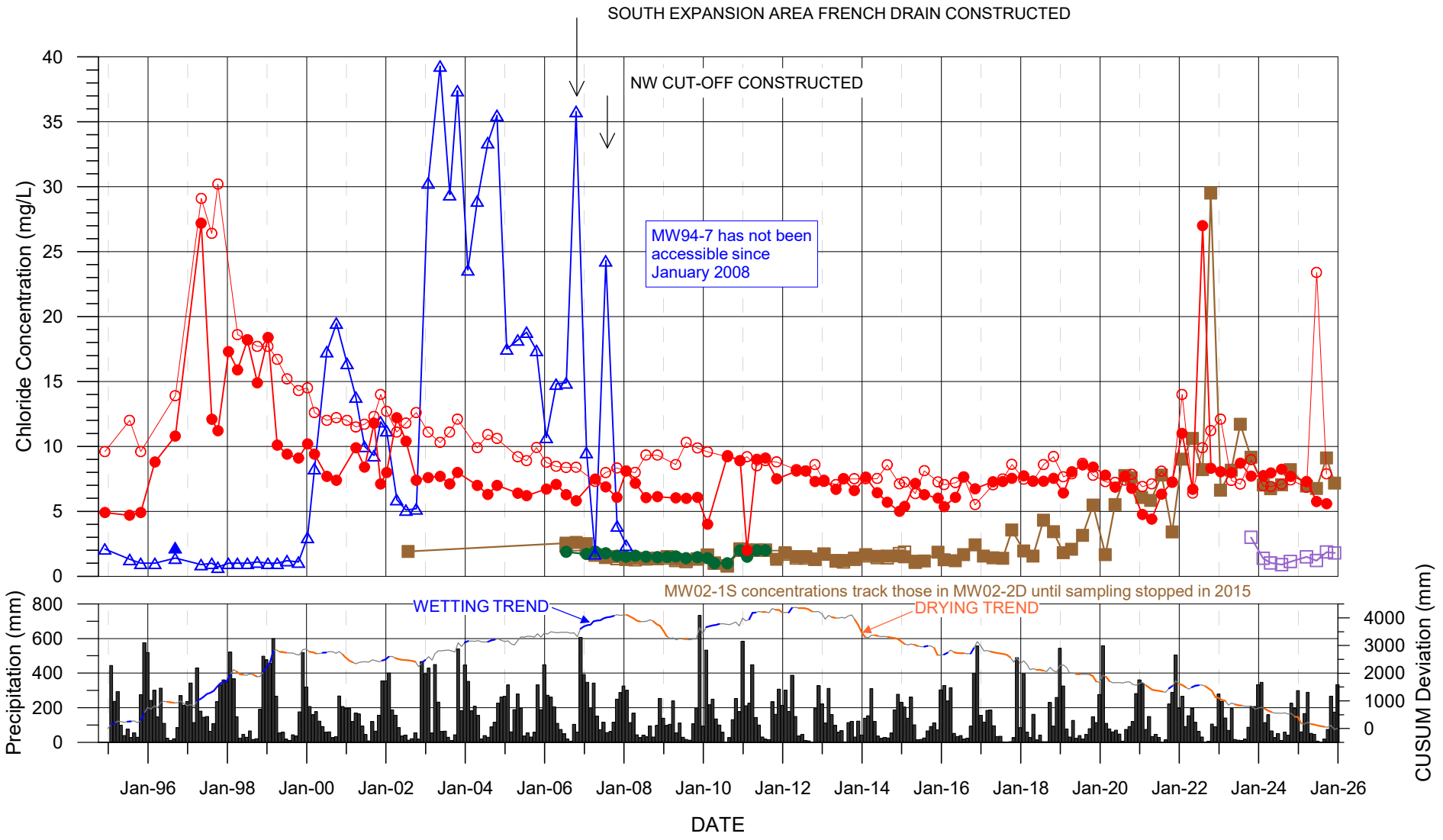

MW94-4S
MW94-4D
MW94-7S
MW94-7D
MW02-1S
MW02-1D
MW02-2
MW23-2

Note:
1. Precipitation measured at Environment Canada's Robertson Creek (1995-2018) and Port Alberni (AUT) (2018-present) stations.

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CHLORIDE CONCENTRATION TIME-SERIES PLOT FOR SOUTH AND WEST WELLS MW94-4, MW94-7, MW02-1, MW02-2 AND MW23-2

BY:	DATE:
SC	MAR 26
APPROVED:	FIG:
JM	B-6

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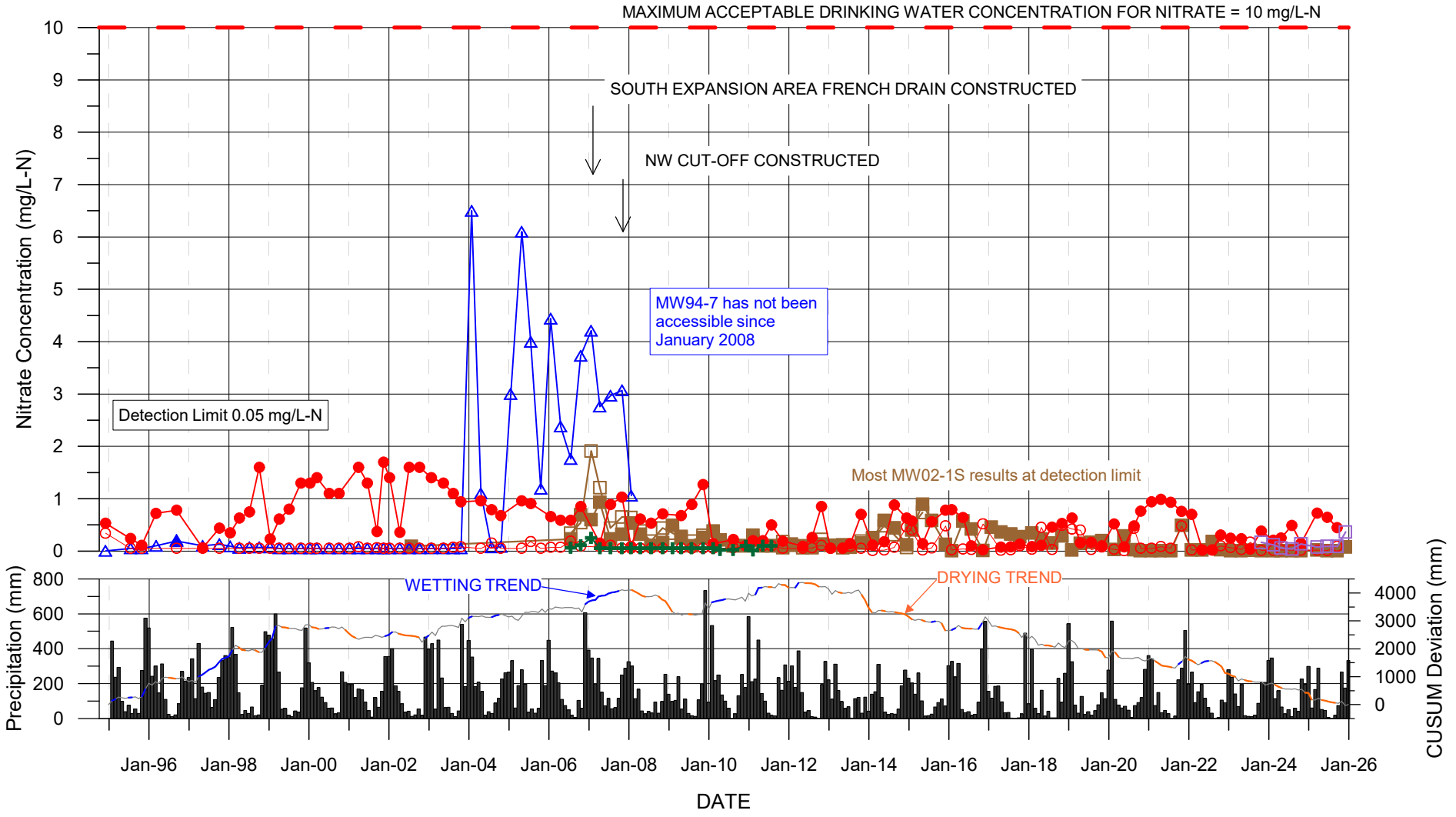

MW94-4S
MW94-4D
MW94-7S
MW94-7D
MW02-1S
MW02-1D
MW02-2
MW23-2

Note:
1. Precipitation measured at Environment Canada's Robertson Creek (1995-2018) and Port Alberni (AUT) (2018-present) stations.

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BY:	DATE:
SC	MAR 26
APPROVED:	FIG:
JM	B-7

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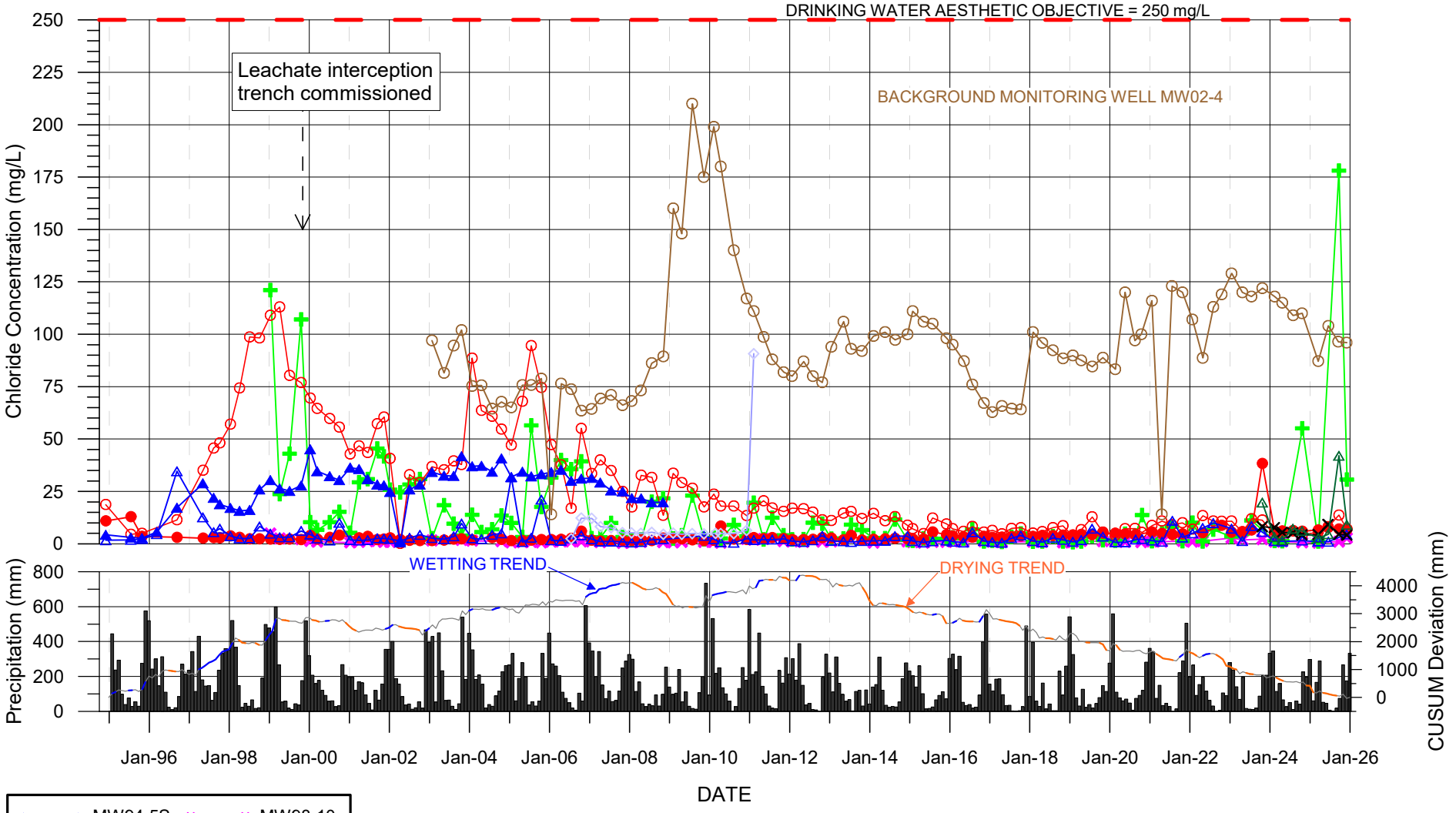

MW94-5S
MW94-5D
MW94-6S
MW94-6D
MW98-9
MW98-10
BH00-4A
MW02-4
MW23-1D
MW23-1S

Note:
1. Precipitation measured at Environment Canada's Robertson Creek (1995-2018) and Port Alberni (AUT) (2018-present) stations.

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CHLORIDE CONCENTRATION TIME-SERIES PLOT FOR NORTH WELLS MW94-5, MW94-6, MW98-9, MW98-10, MW23-1S AND MW23-1D AND BACKGROUND WELLS BH00-4A AND MW02-4

BY:	DATE:
SC	MAR 26
APPROVED:	FIG:
JM	B-8

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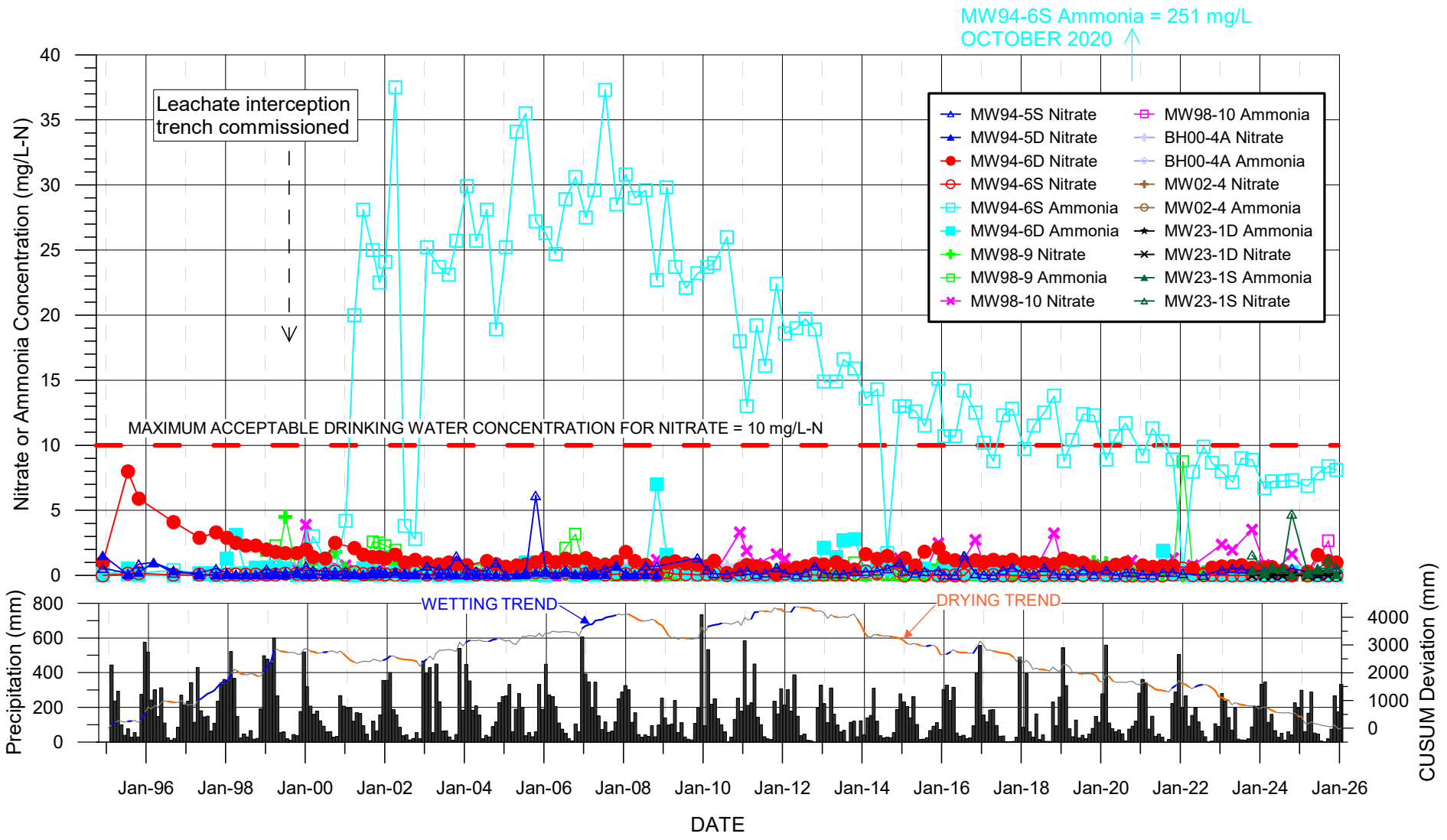

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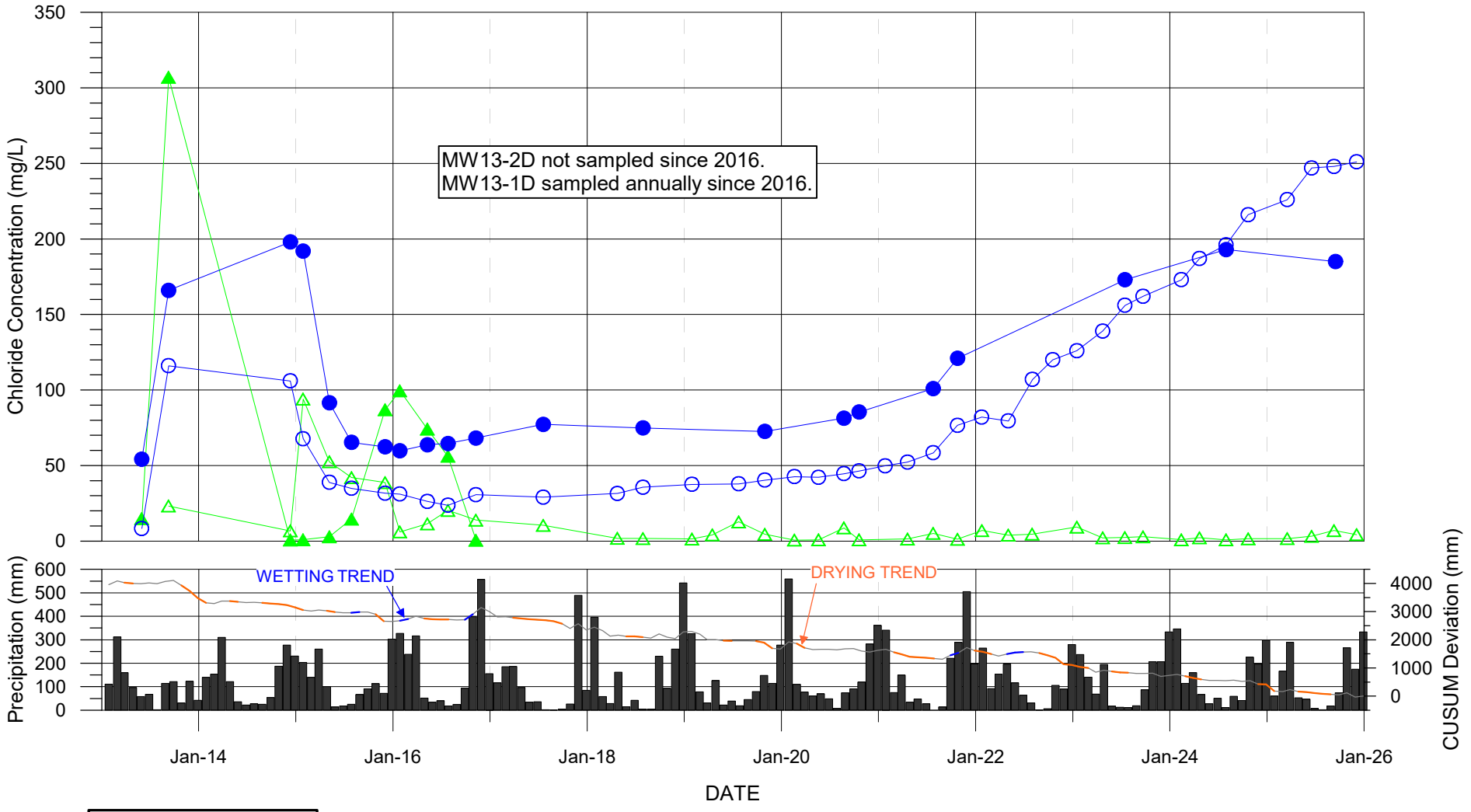
NITROGEN CONCENTRATION TIME-SERIES PLOT FOR NORTH WELLS MW94-5, MW94-6, MW98-9, MW98-10, MW23-1S AND MW23-1D AND BACKGROUND WELLS BH00-4A AND MW02-4

BY:	DATE:
SC	MAR 26
APPROVED:	FIG:
JM	B-9

Note:
1. Precipitation measured at Environment Canada's Robertson Creek (1995-2018) and Port Alberni (AUT) (2018-present) stations.

H:\Project\1005\Analysis\Chemistry\2025\10-MW13_CL.GRF



Note:
1. Precipitation measured at Environment Canada's Robertson Creek (1995-2018) and Port Alberni (AUT) (2018-present) stations.

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CHLORIDE CONCENTRATION TIME-SERIES PLOT FOR MW13-1S, MW13-1D, MW13-2S AND MW13-2D

BY:	DATE:
SC	MAR 26
APPROVED:	FIG:
JM	B-10

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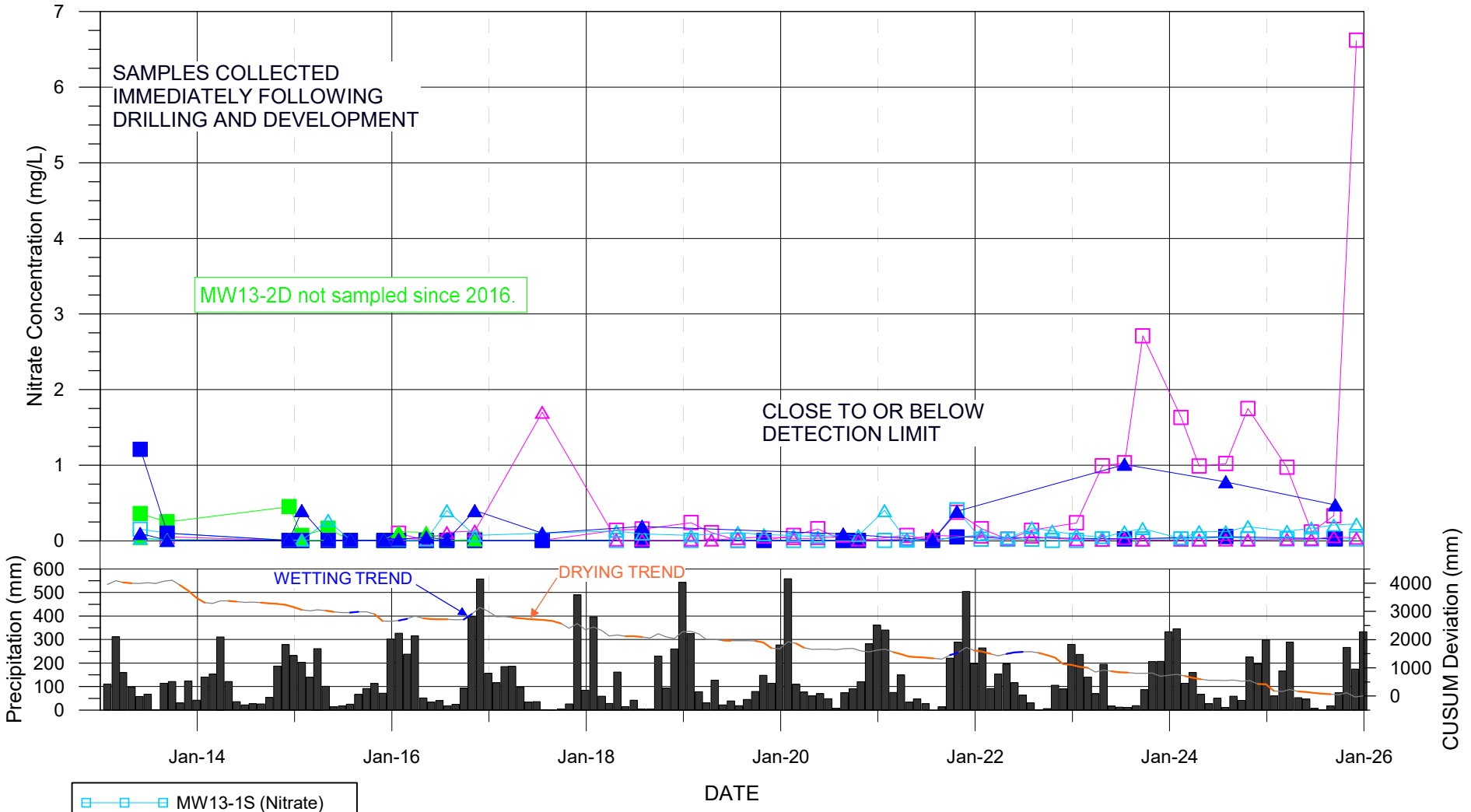

Note:
1. Precipitation measured at Environment Canada's Robertson Creek (1995-2018) and Port Alberni (AUT) (2018-present) stations.

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BY:	DATE:
SC	MAR 26
APPROVED:	FIG:
JM	B-11

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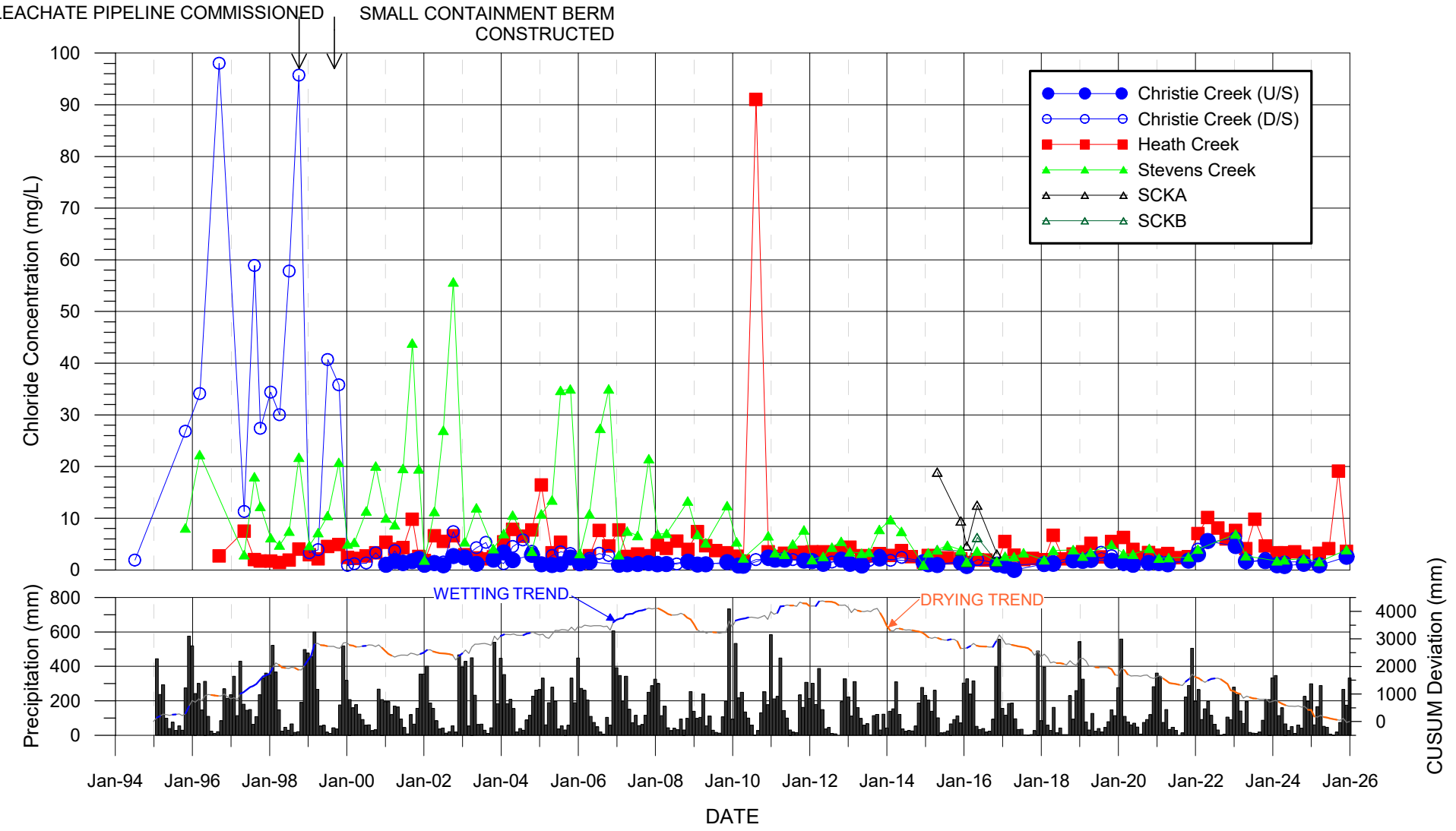

Notes:
1. Christie Creek chloride concentrations dropped from a level indicative of severe leachate impact (approaching 100 mg/L), to less than 5 mg/L, and are now below background concentrations observed in Heath Creek. Values typically increase in summer, during a period of lower dilution, but are expected to stay well below previous levels.
2. Precipitation measured at Environment Canada's Robertson Creek (1995-2018) and Port Alberni (AUT) (2018-present) stations.

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CHLORIDE CONCENTRATION TIME-SERIES PLOT FOR CREEK SAMPLING SITES

BY:	DATE:
SC	MAR 26
APPROVED:	FIG:
JM	B-12

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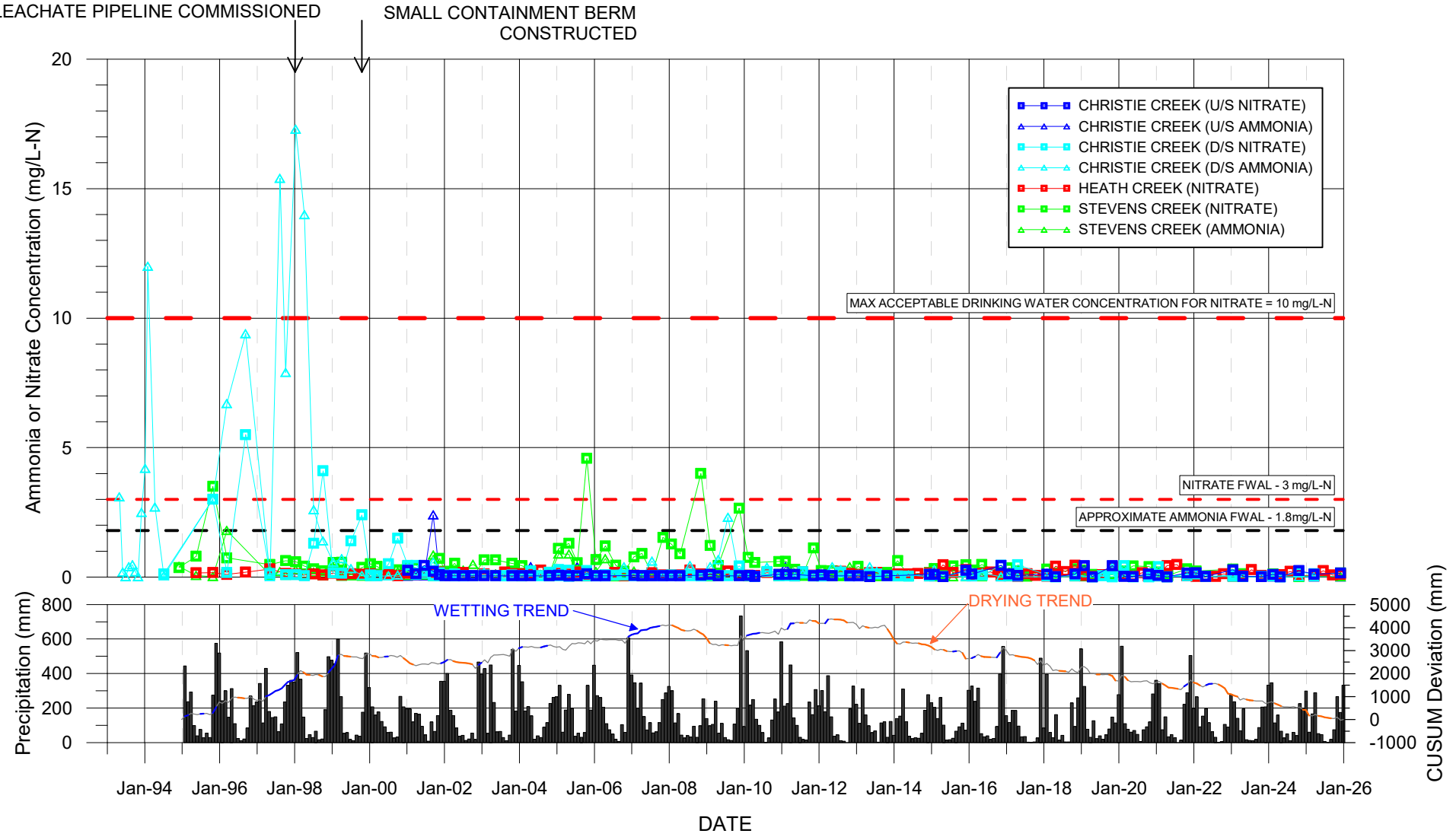

Notes:
1. Winter ammonia concentrations in Christie Creek in years previous to 1999 ranged from about 6 to 17 mg/L-N, generally exceeding the aquatic life criteria of about 1.8 mg/L-N (temperature dependent). Since 2002 concentrations have stayed below 0.07 mg/L-N, well below the aquatic life criteria, with the exception of one summer occasion in 2009.
2. Precipitation measured at Environment Canada's Robertson Creek (1995-2018) and Port Alberni (AUT) (2018-present) stations.

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NITROGEN CONCENTRATION TIME-SERIES PLOT FOR CREEK SAMPLING SITES

BY:	DATE:
SC	MAR 26
APPROVED:	FIG:
JM	B-13

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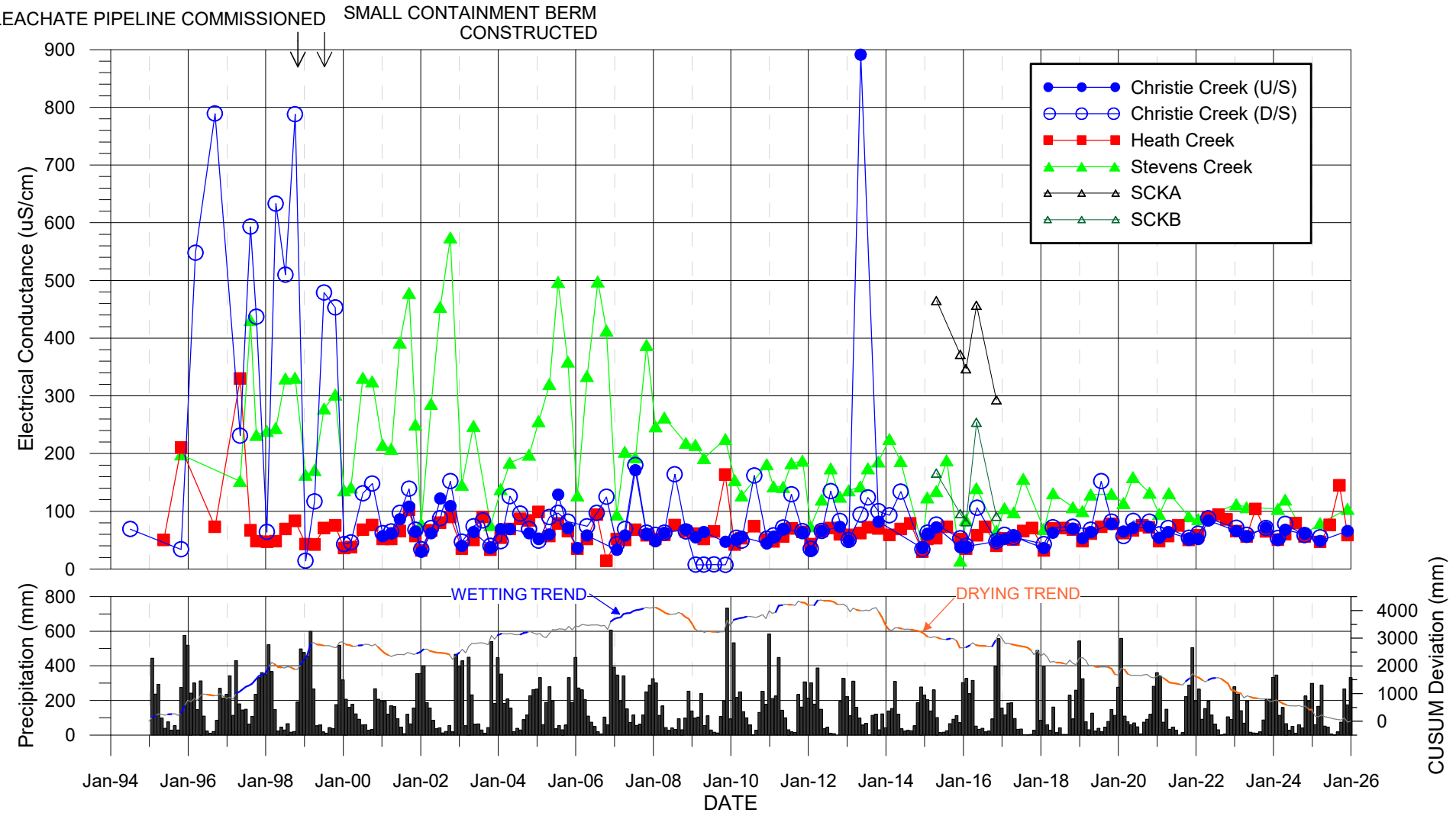

Notes:
1. Winter conductance measurements in Christie Creek approach background measured in Heath Creek, after the pipeline was commissioned.
2. Precipitation measured at Environment Canada's Robertson Creek (1995-2018) and Port Alberni (AUT) (2018-present) stations.

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ELECTRICAL CONDUCTANCE TIME-SERIES PLOT FOR CREEK SAMPLING SITES

BY:	DATE:
SC	MAR 26
APPROVED:	FIG:
JM	B-14

APPENDIX C
MONITORING DATA TABLES FOR 2025 DUPLICATE SAMPLES

APPENDIX C - LIST OF TABLES

TABLE C-1
SUMMARY OF DUPLICATE SAMPLE RESULTS
FOR SUITE 1 ANALYSES - 2025

		MW94-4S			MW23-1D			MW02-3S			PW-2		
SAMPLE DATE	UNITS	18-Jun-25	18-Jun-25	RPD	16-Jun-25	16-Jun-25	RPD	16-Sep-25	16-Sep-25	RPD	04-Dec-25	04-Dec-25	RPD
SAMPLE TYPE		PR	DUP		PR	DUP		PR	DUP		PR	DUP	
LAB NAME		ALS	ALS		ALS	ALS		ALS	ALS		ALS	ALS	
PHYSICAL TESTS													
pH-Lab	pH	9.37	9.36	0	8.32	8.34	0	7.96	7.93	0	6.94	6.91	0
EC-Lab	µS/cm	317	290	9	461	462	0	1090	1090	0	1200	1200	0
Dissolved Hardness ($CaCO_3$)	mg/L	3.67	3.77	3	160	175	9	506	516	2	269	265	1
Total Dissolved Solids	mg/L	218	216	1	311	314	1	678	664	2	551	556	1
DISSOLVED ANIONS													
Alkalinity	mg/L $CaCO_3$	145	115	23	251	252	0	506	518	2	528	531	1
Chloride	mg/L	23.4	17	32	9.14	9.03	1	69.8	68.6	2	64.5	64.4	0
Sulphate	mg/L	6.18	6.18	0	1.13	1.12	1	14.6	14	4	18.5	17.7	4
DISSOLVED METALS													
Aluminum	mg/L	0.0092	0.0082	11	0.0052	0.0049	6	0.0048	0.0042	13	0.0014	0.0016	13
Antimony	mg/L	0.00016	0.00016	0	<0.00010	0.0001	-	0.00012	0.00011	9	0.00011	0.00010	10
Arsenic	mg/L	0.00514	0.00505	2	0.00324	0.00322	1	0.00648	0.00604	7	0.00197	0.00193	2
Barium	mg/L	0.00318	0.00314	1	0.0761	0.0837	10	0.0638	0.0663	4	0.0490	0.0483	1
Beryllium	mg/L	<0.000100	<0.000100	-	<0.000100	<0.000100	-	<0.000100	<0.000100	-	<0.000100	<0.000100	-
Boron	mg/L	1.44	1.44	0	0.755	0.71	6	0.718	0.736	2	0.876	0.869	1
Cadmium	mg/L	<0.0000050	<0.0000050	-	0.0000093	0.0000076	20	0.0000492	0.0000335	38	0.0000302	0.0000311	3
Chromium	mg/L	<0.00050	<0.00050	-	<0.00050	<0.00050	-	<0.00050	<0.00050	-	0.00078	0.00079	1
Cobalt	mg/L	<0.00010	<0.00010	-	0.00026	0.00027	4	0.014	0.0146	4	0.00226	0.00227	0
Copper	mg/L	<0.00020	<0.00020	-	0.00037	0.00036	3	0.0034	0.00288	17	0.0261	0.0202	25
Iron	mg/L	<0.010	<0.010	-	0.138	0.123	11	0.265	0.272	3	0.030	0.033	10
Lead	mg/L	<0.000050	<0.000050	-	<0.000050	<0.000050	-	<0.000050	<0.000050	-	<0.000050	<0.000050	-
Lithium	mg/L	0.0091	0.0094	3	0.0065	0.0071	9	0.0021	0.0021	0	<0.0010	<0.0010	-
Manganese	mg/L	0.00083	0.00083	0	0.546	0.583	7	0.547	0.537	2	3.36	3.26	3
Mercury	µg/L	<0.0050	<0.0050	-	0.0118	0.0114	3	0.0051	<0.0050	>2	<0.0050	<0.0050	-
Molybdenum	mg/L	0.000486	0.000474	3	0.00678	0.00699	3	0.000147	0.000206	33	0.000336	0.000350	4
Nickel	mg/L	<0.00050	<0.00050	-	0.00089	0.0009	1	0.00545	0.00535	2	0.0105	0.0104	1
Selenium	mg/L	<0.000050	<0.000050	-	<0.000050	<0.000050	-	0.000068	0.000075	10	0.000102	0.000064	46
Silver	mg/L	<0.000010	<0.000010	-	<0.000010	<0.000010	-	0.000018	<0.000010	>57	<0.000010	<0.000010	-
Strontium	mg/L	0.0173	0.0175	1	0.406	0.422	4	0.515	0.533	3	0.462	0.465	1
Thallium	mg/L	<0.000010	<0.000010	-	<0.000010	<0.000010	-	<0.000010	<0.000010	-	<0.000010	<0.000010	-
Tin	mg/L	<0.00010	<0.00010	-	0.00104	0.00105	1	0.00012	0.00013	8	<0.00010	<0.00010	-
Titanium	mg/L	<0.00030	<0.00030	-	<0.00030	<0.00030	-	<0.00030	<0.00030	-	<0.00030	<0.00030	-
Tungsten	mg/L	0.00237	0.00231	3	0.00014	0.00014	0	0.00076	0.00091	18	<0.00010	<0.00010	-
Uranium	mg/L	0.000016	0.000016	0	0.000118	0.000117	1	0.000608	0.000646	6	0.000052	0.000053	2
Vanadium	mg/L	0.00059	0.00055	7	<0.00050	<0.00050	-	<0.00050	<0.00050	-	0.00056	0.00058	4
Zinc	mg/L	<0.0010	<0.0010	-	0.0016	0.0015	6	0.0012	0.0016	29	0.508	0.505	1
NUTRIENTS													
Nitrate	mg/L as N	0.0094	0.0079	17	<0.0050	<0.0050	-	<0.0250	<0.0250	-	0.0535	0.0951	56
Ammonia Nitrogen	mg/L as N	0.0772	0.08	4	0.0916	0.0925	1	0.0681	0.05	31	48.6	46.0	5
POLLUTANT TESTS													
Chemical Oxygen Demand	mg/L as O	<10	<10	-	34	40	16	<10	<10	-	53	62	16
RPD Average				6			4			>11			8
RPD Min				0			0			0			0
RPD Max				32			20			>57			56

H:\Project\1005\Analysis\Chemistry\2025\[QAQC.xlsm]Table C-1 \Chemistry\2025\[QAQC.xlsm]Table C-1

NOTES:
"-" denotes the parameter was not analyzed or that both the PR and DUP have values below the detection limit, and no RPD has been calculated.
bold values indicate RPD > 65
PR = primary sample
DUP = duplicate sample
RPD = relative percent difference
">" denotes that one of the samples had a value below the detection limit. The RPD shown is a conversative value based on the detection limit.

TABLE C-2

SUMMARY OF DUPLICATE SAMPLE RESULTS
FOR SUITE 2 ANALYSES - 2025

	UNITS	MW05-1S			MW02-4			MW05-1D		
SAMPLE DATE		17-Mar-25	17-Mar-25		17-Mar-25	17-Mar-25		16-Sep-25	16-Sep-25	
SAMPLE TYPE		PR	DUP	RPD	PR	DUP	RPD	PR	DUP	RPD
LAB NAME		ALS	ALS		ALS	ALS		ALS	ALS	
PHYSICAL TESTS										
pH-Lab	pH	6.76	6.73	0	7.15	7.16	0	7.63	7.6	0
EC-Lab	µS/cm	244	243	0	519	508	2	907	909	0
Total Dissolved Solids	mg/L	236	232	2	369	366	1	564	540	4
DISSOLVED ANIONS										
Chloride	mg/L	18.9	19.0	1	87.1	89.5	3	43.1	43	0
Sulphate	mg/L	12.2	12.3	1	11.6	11.7	1	5.08	5.12	1
NUTRIENTS										
Nitrate	mg/L as N	8.68	8.73	1	0.0414	0.0399	4	0.041	0.0364	12
Ammonia Nitrogen	mg/L as N	<0.0050	<0.0050	-	<0.0050	<0.0050	-	1.62	1.67	3

RPD Average		1	2	3
RPD Min		0	0	0
RPD Max		2	4	12

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PR = primary sample
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RPD = relative percent difference
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TABLE C-3
SUMMARY OF DUPLICATE SAMPLE RESULTS
FOR SUITE 3 ANALYSES - 2025

	UNITS	Stevens Creek		
SAMPLE DATE		18-Mar-25	18-Mar-25	
SAMPLE TYPE		PR	DUP	RPD
LAB NAME		ALS	ALS	
PHYSICAL TESTS				
pH-Lab	pH	7.23	7.19	1
EC-Lab	µS/cm	79.2	78.0	2
Total Hardness ($CaCO_3$)	mg/L	36.8	37.5	2
DISSOLVED ANIONS				
Chloride	mg/L	1.59	1.60	1
Sulphate	mg/L	0.73	1.65	**77**
TOTAL METALS				
Aluminum	mg/L	0.850	1.01	17
Antimony	mg/L	<0.00010	<0.00010	-
Arsenic	mg/L	0.00016	0.000226	34
Barium	mg/L	0.00814	0.00917	12
Beryllium	mg/L	<0.000100	<0.00010	-
Boron	mg/L	0.030	0.0290	3
Cadmium	mg/L	0.0000118	0.0000112	5
Chromium	mg/L	0.00140	0.00172	21
Cobalt	mg/L	0.00067	0.000769	14
Copper	mg/L	0.00303	0.00337	11
Iron	mg/L	1.11	1.28	14
Lead	mg/L	0.000253	0.000289	13
Lithium	mg/L	<0.0010	<0.0010	-
Manganese	mg/L	0.654	0.737	12
Mercury	µg/L	0.0058	0.0058	0
Molybdenum	mg/L	<0.000050	<0.000050	-
Nickel	mg/L	0.00089	0.00101	13
Selenium	mg/L	0.000060	<0.000050	>18
Silver	mg/L	<0.000010	<0.000010	-
Strontium	mg/L	0.0371	0.0396	7
Thallium	mg/L	<0.000010	<0.000010	-
Tin	mg/L	0.00013	<0.00010	>26
Titanium	mg/L	0.0740	0.0911	21
Tungsten	mg/L	<0.00010	<0.00010	-
Uranium	mg/L	<0.000010	<0.000010	-
Vanadium	mg/L	0.00389	0.00459	17
mg/L	mg/L	0.0036	0.00426	17
NUTRIENTS				
Nitrate	mg/L as N	0.106	0.112	6
Ammonia Nitrogen	mg/L as N	0.0156	0.0081	63
Total Phosphorus	mg/L	0.0337	0.0346	3
POLLUTANT TESTS				
Chemical Oxygen Demand	mg/L as O	22	23	4

RPD Average	>16
RPD Min	0
RPD Max	**77**

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PR = primary sample
DUP = duplicate sample
RPD = relative percent difference
">" denotes that one of the samples had a value below the detection limit. The RPD shown is a conversative value based on the detection limit.