



Real Time Water Quality 2025 Annual Report

Equinox Gold: Valentine Gold Mine

2025-01-01 to 2025-12-31

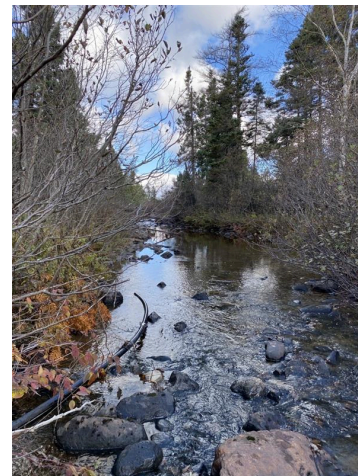
Government of Newfoundland & Labrador
Department of Environment, Conservation & Climate Change
Water Resources Management Division

Equinox Gold: Valentine Gold Mine

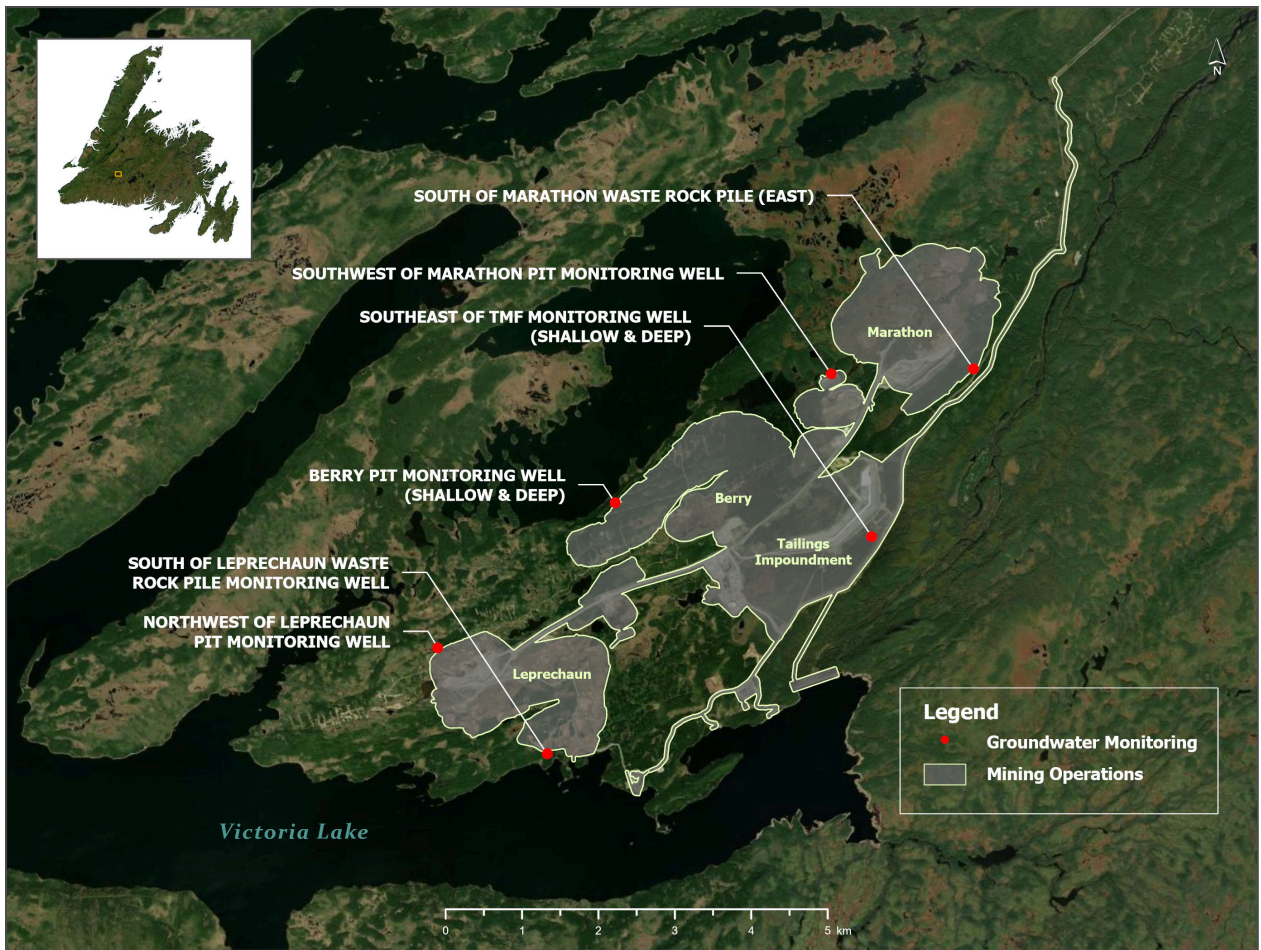
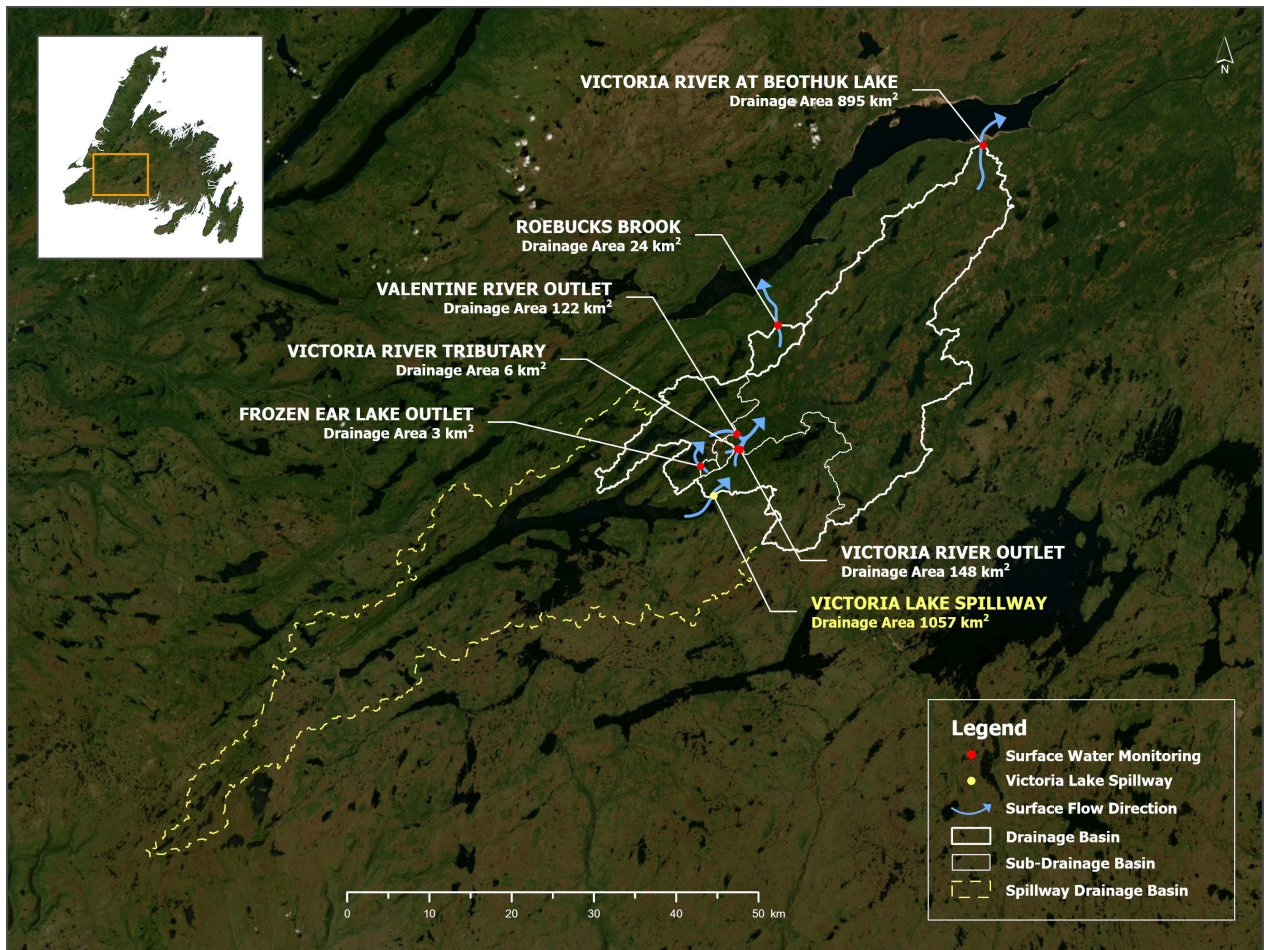
The Real-Time Water Quality (RTWQ) network at Equinox Gold's Valentine Gold Mine was successfully established in 2022 by the Newfoundland and Labrador Department of Environment, Conservation and Climate Change (NL-ECCC), Water Resources Management Division (WRMD), in collaboration with Equinox Gold (formerly Calibre Mining/Marathon Gold). Since 2022, the network has steadily expanded and plays a key role in identifying and tracking emerging water quality and quantity issues on site. Real-time continuous monitoring enables early detection of potential water quality or quantity issues, allowing for prompt response and timely implementation of mitigation measures. Each water quality instrument is programmed with an internal log file, which ensures continuous data collection even during short periods when real-time data transmission is interrupted.

The network currently comprises fourteen stations strategically located across the mine site. Six are surface water stations that record and transmit hourly measurements for temperature, pH, specific conductivity, dissolved oxygen concentration, and turbidity. Two additional parameters - total dissolved solids and dissolved oxygen percent saturation - are derived from the measured data. Water elevation is also measured at each station. The remaining eight stations are groundwater monitoring wells that record and transmit hourly measurements for temperature, pH, conductivity, oxidation-reduction potential (ORP), and water elevation. YSI EXO1 sondes are used in the groundwater wells, while YSI EXO3 sondes are deployed at the surface water stations. Site visits for surface water stations are conducted every 4–6 weeks to replace instruments with freshly calibrated units, collect grab samples for quality control, and perform any necessary maintenance. Groundwater site visits occurred every 10–12 weeks to switch out instruments, purge the wells, collect grab samples and complete necessary maintenance. Deployment reports are generated at the end of each deployment period for surface water. Groundwater data is compiled and reported annually, along with annual surface water data.

This annual deployment report covers groundwater data collected between January 1 and December 31, 2025. Surface water hydrometric data is reported for the same period, while water quality data spans from April to December 2025 as instrumentation is removed during the winter season to prevent ice and freeze damage to the sensors.



Equinox Gold: Valentine Gold Mine RTWQ Network



Quality Assurance and Quality Control Procedures

As part of the Quality Assurance and Quality Control protocol (QA/QC), an assessment of the reliability of data recorded by an instrument is made at the beginning and end of the deployment period. The procedure is based on the approach used by the United States Geological Survey. With the exception of water quantity data (elevation), all data used in the preparation of the graphs and subsequent discussion adhere to this stringent QA/QC protocol. Corrected data can be obtained upon request.

Parameter	Excellent	Good	Fair	Marginal	Poor
pH	$\leq \pm 0.2$ units	$\leq \pm 0.21 - 0.5$ units	$\leq \pm 0.51 - 0.8$ units	$\leq \pm 0.81 - 1$ units	$> \pm 1$ units
Water Temperature	$\leq \pm 0.2^{\circ}\text{C}$	$\leq \pm 0.21 - 0.5^{\circ}\text{C}$	$\leq \pm 0.51 - 0.8^{\circ}\text{C}$	$\leq \pm 0.81 - 1^{\circ}\text{C}$	$> \pm 1^{\circ}\text{C}$
Dissolved oxygen	$\leq \pm 0.3$ mg/L	$\leq \pm 0.31 - 0.5$ mg/L	$\leq \pm 0.51 - 0.8$ mg/L	$\leq \pm 0.81 - 1$ mg/L	$> \pm 1$ mg/L
Turbidity	$\leq \pm 2$ turbidity units or $\leq \pm 5\%$, whichever is greater	$\leq \pm 2.1-5$ turbidity units or $\leq \pm 5.1-10\%$, whichever is greater	$\leq \pm 5.1-8$ turbidity units or $\leq \pm 10.1-15\%$, whichever is greater	$\leq \pm 8.1-10$ turbidity units or $\leq \pm 15.1-20\%$, whichever is greater	$> \pm 10$ turbidity units or $> \pm 20\%$, whichever is greater
Specific Conductance	$\leq \pm 3$ $\mu\text{S}/\text{cm}$ or $\leq \pm 3\%$, whichever is greater	$\leq \pm 3.1-10$ $\mu\text{S}/\text{cm}$ or $\leq \pm 3.1-10\%$, whichever is greater	$\leq \pm 10 - 15$ $\mu\text{S}/\text{cm}$ or $\leq \pm 10.1-15\%$, whichever is greater	$\leq \pm 15.1 - 20$ $\mu\text{S}/\text{cm}$ or $\leq \pm 15.1-20\%$, whichever is greater	$> \pm 20$ $\mu\text{S}/\text{cm}$ or $> \pm 20\%$, whichever is greater

During surface water deployments and removals, a QA/QC Sonde is temporarily deployed adjacent to the Field Sonde. Values for temperature, pH, conductivity, dissolved oxygen and turbidity are compared between the two instruments. Based on the degree of difference between parameters recorded by the Field Sonde and QA/QC Sonde at deployment and at removal, a qualitative statement is made on the data quality. There are a few circumstances which may cause QA/QC rankings below excellent, including the placement of the QA/QC sonde in relation to the field sonde, the amount of time each sonde was given to stabilize before readings were recorded, and deteriorating performance of one of the sensors.

The temperature sensor on any sonde is the most important. All other parameters can be divided into subgroups of: temperature dependent, temperature compensated, and temperature independent. Due to the temperature sensor's location on the sonde, the entire sonde must be at a constant temperature before the temperature sensor will stabilize. The values may take some time to climb to the appropriate reading; if a reading is taken too soon it may not accurately portray the water body.

Additionally, grab samples are collected during deployment to compare pH, specific conductivity and turbidity values between the field instrument and the grab samples. Variability in results may be attributed to differences in the sampling location or depth relative to the sonde's deployment site or insufficient equilibration time for the sonde when initial field data was collected.

During groundwater deployments and removals, grab samples are collected to compare against initial in-situ logged data. Values for pH and specific conductivity are compared between the instrument and the grab sample. There are a few circumstances which may cause QA/QC rankings below excellent. Typically when the well is pumped to provide water for the grab sample, the pumping can disturb the water column including any diluted salts and inorganic materials that are present in the groundwater. Additionally, in-situ instrument measurements are recorded shortly after the freshly calibrated instrument is deployed. The limited time for the sonde to reach equilibrium with its surroundings can occasionally lead to variations in values between grab sample results and instrument measurements.

Hydrometric Data

Water Resources Management Division hydrometric (stage and flow) data is quality controlled on a less frequent basis than water quality data due to differences in protocols. The hydrometric data shown in this report is provisional and has not undergone quality control checks.

QAQC

Surface Water Deployment Rankings

There were five surface water deployment periods during the monitoring season:

- April - June
- June - August
- August - September
- September - November
- November - December

At the time of deployment across all monitoring periods and stations, parameter rankings ranged from poor to excellent, with the majority receiving good or excellent rankings. Lower rankings were primarily associated with dissolved oxygen (DO) and pH measurements. Fair, marginal, and occasional poor DO rankings were observed at several stations throughout the season, particularly from August onward. As these lower rankings occurred consistently across multiple stations, they are likely indicative of QAQC sonde sensor deterioration rather than site-specific issues. Fair pH rankings were also observed periodically and were most likely related to insufficient equilibration time of the field sonde before initial measurements were recorded. Isolated fair rankings for conductivity and turbidity were generally attributed to differences in placement between the QAQC sonde and field sonde.

At the time of removal, rankings also ranged from poor to excellent, with most parameters classified as good or excellent. Dissolved oxygen continued to show the greatest variability and accounted for the majority of lower rankings observed during removals. Beginning in the June-August deployment period and continuing through November-December, DO frequently ranked fair, marginal, or poor at multiple stations. The consistency of these lower rankings across stations suggests deterioration of the QAQC dissolved oxygen sensor during the latter part of the monitoring season. Other lower removal rankings were isolated and generally attributable to sonde placement differences or insufficient equilibration time prior to measurement collection. There was no QAQC data available upon removal for Victoria River Outlet during the June-August deployment and nor for Frozen Ears Lake Outlet during the September - November deployment. There was no removal QAQC or grab sample data collected at Victoria River at Beothuk Lake during the November-December deployment due to unsafe ice conditions along the river edge.

Grab sample comparisons ranged from poor to excellent throughout the season. Lower rankings were observed primarily for pH and, less frequently, specific conductivity. These discrepancies are likely related to differences between grab sample collection locations and sonde placement, as well as insufficient time for field sondes to fully equilibrate before initial comparison measurements were recorded. Despite these occasional lower rankings, grab sample comparisons generally demonstrated strong agreement with instrument measurements.

Overall, the results indicate that temperature, specific conductivity, and turbidity sensors performed consistently well throughout the monitoring season, while pH showed minor variability associated with sensor equilibration. Dissolved oxygen exhibited the greatest variability and the majority of lower rankings, likely reflecting QAQC sonde sensor deterioration later in the season. Nevertheless, the predominance of good and excellent rankings across all stations and parameters demonstrates that the surface water monitoring dataset is of high quality and suitable for interpretation and reporting.

Surface Water QAQC Deployment Rankings

QAQC Rankings: April-June

Station	Parameter	Deployment Rank	Grab Sample Deployment	Removal Rank
▲				
Frozen Ear Lake Outlet	Dissolved Oxygen (mg/l)	Excellent	-	Excellent
Frozen Ear Lake Outlet	pH	Fair	Poor	Excellent
Frozen Ear Lake Outlet	Specific Conductivity (µS/cm)	Excellent	Good	Excellent
Frozen Ear Lake Outlet	Temperature (°C)	Excellent	-	Excellent
Frozen Ear Lake Outlet	Turbidity (NTU)	Good	Fair	Excellent
Roebucks Brook	Dissolved Oxygen (mg/l)	Good	-	Good
Roebucks Brook	pH	Excellent	Good	Excellent
Roebucks Brook	Specific Conductivity (µS/cm)	Excellent	Excellent	Excellent
Roebucks Brook	Temperature (°C)	Excellent	-	Excellent
Roebucks Brook	Turbidity (NTU)	Excellent	Excellent	Excellent
Valentine River Outlet	Dissolved Oxygen (mg/l)	Fair	-	Good
Valentine River Outlet	pH	Good	Fair	Good
Valentine River Outlet	Specific Conductivity (µS/cm)	Excellent	Excellent	Excellent
Valentine River Outlet	Temperature (°C)	Excellent	-	Excellent
Valentine River Outlet	Turbidity (NTU)	Excellent	Excellent	Excellent
Victoria River at Beothuk Lake	Dissolved Oxygen (mg/l)	Fair	-	Excellent
Victoria River at Beothuk Lake	pH	Fair	Fair	Excellent
Victoria River at Beothuk Lake	Specific Conductivity (µS/cm)	Good	Good	Good
Victoria River at Beothuk Lake	Temperature (°C)	Excellent	-	Excellent
Victoria River at Beothuk Lake	Turbidity (NTU)	Excellent	Excellent	Excellent
Victoria River Outlet	Dissolved Oxygen (mg/l)	Fair	-	Excellent
Victoria River Outlet	pH	Excellent	Good	Good
Victoria River Outlet	Specific Conductivity (µS/cm)	Excellent	Excellent	Excellent
Victoria River Outlet	Temperature (°C)	Excellent	-	Excellent
Victoria River Outlet	Turbidity (NTU)	Excellent	Excellent	Excellent
Victoria River Tributary	Dissolved Oxygen (mg/l)	Good	-	Good
Victoria River Tributary	pH	Good	Good	Excellent
Victoria River Tributary	Specific Conductivity (µS/cm)	Excellent	Good	Good
Victoria River Tributary	Temperature (°C)	Excellent	-	Excellent
Victoria River Tributary	Turbidity (NTU)	Excellent	Excellent	Excellent

QAQC Rankings: June - August

Station	Parameter	Deployment Rank	Grab Sample Deployment	Removal Rank
▲				
Frozen Ear Lake Outlet	Dissolved Oxygen (mg/l)	Excellent	-	Good
Frozen Ear Lake Outlet	pH	Marginal	Marginal	Good
Frozen Ear Lake Outlet	Specific Conductivity (µS/cm)	Excellent	Fair	Good
Frozen Ear Lake Outlet	Temperature (°C)	Good	-	Excellent
Frozen Ear Lake Outlet	Turbidity (NTU)	Excellent	Excellent	Good
Roebucks Brook	Dissolved Oxygen (mg/l)	Excellent	-	Marginal
Roebucks Brook	pH	Good	Good	Excellent
Roebucks Brook	Specific Conductivity (µS/cm)	Excellent	Excellent	Good
Roebucks Brook	Temperature (°C)	Excellent	-	Excellent
Roebucks Brook	Turbidity (NTU)	Excellent	Excellent	Good
Valentine River Outlet	Dissolved Oxygen (mg/l)	Excellent	-	Fair
Valentine River Outlet	pH	Excellent	Excellent	Good
Valentine River Outlet	Specific Conductivity (µS/cm)	Excellent	Excellent	Excellent
Valentine River Outlet	Temperature (°C)	Excellent	-	Excellent
Valentine River Outlet	Turbidity (NTU)	Excellent	Excellent	Excellent
Victoria River at Beothuk Lake	Dissolved Oxygen (mg/l)	Excellent	-	Fair
Victoria River at Beothuk Lake	pH	Good	Excellent	Good
Victoria River at Beothuk Lake	Specific Conductivity (µS/cm)	Excellent	Excellent	Excellent
Victoria River at Beothuk Lake	Temperature (°C)	Excellent	-	Excellent
Victoria River at Beothuk Lake	Turbidity (NTU)	Excellent	Excellent	Excellent
Victoria River Outlet	Dissolved Oxygen (mg/l)	-	-	Good
Victoria River Outlet	pH	-	Good	Good
Victoria River Outlet	Specific Conductivity (µS/cm)	-	Excellent	Excellent
Victoria River Outlet	Temperature (°C)	-	-	Excellent
Victoria River Outlet	Turbidity (NTU)	-	Excellent	Excellent
Victoria River Tributary	Dissolved Oxygen (mg/l)	Excellent	-	Fair
Victoria River Tributary	pH	Fair	Fair	Good
Victoria River Tributary	Specific Conductivity (µS/cm)	Excellent	Good	Excellent
Victoria River Tributary	Temperature (°C)	Excellent	-	Excellent
Victoria River Tributary	Turbidity (NTU)	Excellent	Excellent	Excellent

Surface Water QAQC Deployment Rankings



QAQC Rankings: August - September				
Station	Parameter	Deployment Rank	Grab Sample Deployment	Removal Rank
▲				
Frozen Ear Lake Outlet	Dissolved Oxygen (mg/l)	Marginal	-	Poor
Frozen Ear Lake Outlet	pH	Excellent	Fair	Excellent
Frozen Ear Lake Outlet	Specific Conductivity (µS/cm)	Good	Good	Excellent
Frozen Ear Lake Outlet	Temperature (°C)	Good	-	Good
Frozen Ear Lake Outlet	Turbidity (NTU)	Good	Good	Excellent
Roebucks Brook	Dissolved Oxygen (mg/l)	Good	-	Good
Roebucks Brook	pH	Good	Fair	Excellent
Roebucks Brook	Specific Conductivity (µS/cm)	Good	Excellent	Poor
Roebucks Brook	Temperature (°C)	Excellent	-	Excellent
Roebucks Brook	Turbidity (NTU)	Good	Excellent	Good
Valentine River Outlet	Dissolved Oxygen (mg/l)	Excellent	-	Excellent
Valentine River Outlet	pH	Excellent	Excellent	Good
Valentine River Outlet	Specific Conductivity (µS/cm)	Excellent	Excellent	Excellent
Valentine River Outlet	Temperature (°C)	Excellent	-	Excellent
Valentine River Outlet	Turbidity (NTU)	Excellent	Excellent	Excellent
Victoria River at Beothuk Lake	Dissolved Oxygen (mg/l)	Excellent	-	Good
Victoria River at Beothuk Lake	pH	Fair	Fair	Excellent
Victoria River at Beothuk Lake	Specific Conductivity (µS/cm)	Excellent	Excellent	Excellent
Victoria River at Beothuk Lake	Temperature (°C)	Good	-	Excellent
Victoria River at Beothuk Lake	Turbidity (NTU)	Excellent	Excellent	Excellent
Victoria River Outlet	Dissolved Oxygen (mg/l)	Good	-	Fair
Victoria River Outlet	pH	Excellent	Fair	Excellent
Victoria River Outlet	Specific Conductivity (µS/cm)	Excellent	Excellent	Excellent
Victoria River Outlet	Temperature (°C)	Excellent	-	Excellent
Victoria River Outlet	Turbidity (NTU)	Excellent	Good	Excellent
Victoria River Tributary	Dissolved Oxygen (mg/l)	Good	-	Fair
Victoria River Tributary	pH	Excellent	Fair	Good
Victoria River Tributary	Specific Conductivity (µS/cm)	Excellent	Good	Excellent
Victoria River Tributary	Temperature (°C)	Good	-	Excellent
Victoria River Tributary	Turbidity (NTU)	Excellent	Excellent	Excellent

QAQC Rankings: September - November				
Station	Parameter	Deployment Rank	Deployment Grab Sample	Removal Rank
▲				
Frozen Ear Lake Outlet	Dissolved Oxygen (mg/l)	Fair	-	-
Frozen Ear Lake Outlet	pH	Excellent	Good	-
Frozen Ear Lake Outlet	Specific Conductivity (µS/cm)	Excellent	Excellent	-
Frozen Ear Lake Outlet	Temperature (°C)	Good	-	-
Frozen Ear Lake Outlet	Turbidity (NTU)	Good	Excellent	-
Roebucks Brook	Dissolved Oxygen (mg/l)	Good	-	Poor
Roebucks Brook	pH	Excellent	Good	Excellent
Roebucks Brook	Specific Conductivity (µS/cm)	Excellent	Excellent	Excellent
Roebucks Brook	Temperature (°C)	Excellent	-	Excellent
Roebucks Brook	Turbidity (NTU)	Fair	Excellent	Excellent
Valentine River Outlet	Dissolved Oxygen (mg/l)	Excellent	-	Fair
Valentine River Outlet	pH	Excellent	Excellent	Fair
Valentine River Outlet	Specific Conductivity (µS/cm)	Excellent	Excellent	Excellent
Valentine River Outlet	Temperature (°C)	Excellent	-	Excellent
Valentine River Outlet	Turbidity (NTU)	Excellent	Excellent	Good
Victoria River at Beothuk Lake	Dissolved Oxygen (mg/l)	Excellent	-	Poor
Victoria River at Beothuk Lake	pH	Good	Good	Excellent
Victoria River at Beothuk Lake	Specific Conductivity (µS/cm)	Excellent	Excellent	Excellent
Victoria River at Beothuk Lake	Temperature (°C)	Good	-	Excellent
Victoria River at Beothuk Lake	Turbidity (NTU)	Excellent	Excellent	Good
Victoria River Outlet	Dissolved Oxygen (mg/l)	Fair	-	Poor
Victoria River Outlet	pH	Excellent	Good	Good
Victoria River Outlet	Specific Conductivity (µS/cm)	Excellent	Excellent	Excellent
Victoria River Outlet	Temperature (°C)	Excellent	-	Excellent
Victoria River Outlet	Turbidity (NTU)	Excellent	Excellent	Excellent
Victoria River Tributary	Dissolved Oxygen (mg/l)	Fair	-	Poor
Victoria River Tributary	pH	Good	Excellent	Good
Victoria River Tributary	Specific Conductivity (µS/cm)	Excellent	Excellent	Good
Victoria River Tributary	Temperature (°C)	Good	-	Excellent
Victoria River Tributary	Turbidity (NTU)	Excellent	Excellent	Excellent

Surface Water QAQC Deployment Rankings

QAQC Rankings: November - December					
Station	Parameter	Deployment Rank	Deployment Grab Sample	Removal Rank	Removal Grab Sample
▲					
Frozen Ear Lake Outlet	Dissolved Oxygen (mg/l)	Fair	-	Poor	-
Frozen Ear Lake Outlet	pH	Excellent	Good	Fair	Excellent
Frozen Ear Lake Outlet	Specific Conductivity (µS/cm)	Excellent	Excellent	Good	Good
Frozen Ear Lake Outlet	Temperature (°C)	Good	-	Excellent	-
Frozen Ear Lake Outlet	Turbidity (NTU)	Good	Excellent	Good	Fair
Roebucks Brook	Dissolved Oxygen (mg/l)	Marginal	-	Marginal	-
Roebucks Brook	pH	Good	Poor	Fair	Good
Roebucks Brook	Specific Conductivity (µS/cm)	Excellent	Excellent	Excellent	Good
Roebucks Brook	Temperature (°C)	Excellent	-	Excellent	-
Roebucks Brook	Turbidity (NTU)	Good	Excellent	Excellent	Excellent
Valentine River Outlet	Dissolved Oxygen (mg/l)	Good	-	Good	-
Valentine River Outlet	pH	Excellent	Marginal	Fair	Excellent
Valentine River Outlet	Specific Conductivity (µS/cm)	Excellent	Excellent	Excellent	Excellent
Valentine River Outlet	Temperature (°C)	Excellent	-	Excellent	-
Valentine River Outlet	Turbidity (NTU)	Good	Excellent	Excellent	Excellent
Victoria River at Beothuk Lake	Dissolved Oxygen (mg/l)	Poor	-	-	-
Victoria River at Beothuk Lake	pH	Fair	Poor	-	-
Victoria River at Beothuk Lake	Specific Conductivity (µS/cm)	Fair	Good	-	-
Victoria River at Beothuk Lake	Temperature (°C)	Excellent	-	-	-
Victoria River at Beothuk Lake	Turbidity (NTU)	Good	Excellent	-	-
Victoria River Outlet	Dissolved Oxygen (mg/l)	Marginal	-	Marginal	-
Victoria River Outlet	pH	Fair	Poor	Excellent	Good
Victoria River Outlet	Specific Conductivity (µS/cm)	Excellent	Excellent	Excellent	Excellent
Victoria River Outlet	Temperature (°C)	Excellent	-	Excellent	-
Victoria River Outlet	Turbidity (NTU)	Good	Excellent	Fair	Excellent
Victoria River Tributary	Dissolved Oxygen (mg/l)	Poor	-	Poor	-
Victoria River Tributary	pH	Good	Fair	Good	Good
Victoria River Tributary	Specific Conductivity (µS/cm)	Fair	Marginal	Excellent	Fair
Victoria River Tributary	Temperature (°C)	Excellent	-	Excellent	-
Victoria River Tributary	Turbidity (NTU)	Fair	Excellent	Excellent	Excellent

Groundwater Deployment Rankings

There were three groundwater deployment periods during the 2025 monitoring season with maintenance, occurring in April, July, and October. Instruments were deployed in April following winter instrument retrieval, replaced with freshly calibrated instruments in July, and again in November as part of routine maintenance and monitoring activities. QAQC results indicate generally good agreement between field instrumentation and QAQC measurements. Groundwater QAQC assessments focused on pH and specific conductivity, and rankings ranged from poor to excellent across the monitoring network.

At the time of deployment, rankings ranged from poor to excellent, with most measurements classified as good or excellent. Specific conductivity generally demonstrated strong performance throughout the monitoring season, with only a few fair, marginal, or poor rankings observed. Lower conductivity rankings occurred primarily at Southeast of TMF Shallow, South of Marathon Waste Rock Pile, and South of Leprechaun Waste Rock Pile, and are likely attributable to disturbance in the water column from purging, or stabilization time prior to recording initial measurements. pH exhibited greater variability than conductivity and accounted for most of the marginal and poor rankings observed throughout the season. Several wells, including Northwest of Leprechaun Pit, South of Leprechaun Waste Rock Pile, and Southeast of TMF wells, received lower pH rankings during deployment. These rankings are likely related to sensor equilibration time, or disturbance in the water column from purging the well to collect grab samples.

At the time of removal, rankings also ranged from poor to excellent, with the majority of measurements remaining good or excellent. Specific conductivity continued to show generally strong agreement between field and QAQC measurements, although isolated poor rankings were observed at South of Leprechaun Waste Rock Pile, Northwest of Leprechaun Pit, and Southeast of TMF Shallow during some monitoring periods. pH rankings generally improved between deployment and removal events, suggesting that field sensors stabilized over the deployment period. However, fair and poor rankings persisted at a small number of locations, particularly at Northwest of Leprechaun Pit and South of Leprechaun Waste Rock Pile during some monitoring events. These lower rankings likely reflect proximity to mine activities, minor sensor variability or natural groundwater conditions rather than instrument issues.

Groundwater QAQC rankings may periodically fall below good for several reasons. Prior to deployment, removal, and sampling activities, groundwater wells are purged to ensure collection of representative groundwater samples. Purging can disturb sediments, alter water chemistry within the well column, and temporarily affect field measurements until conditions stabilize. These effects are often more pronounced in shallow wells and wells with elevated sediment loads. The lower rankings at sites with both shallow and deep wells are likely related to the hydraulic connection between the two wells. As the shallow well is sampled prior to the deep well, pumping and drawdown effects in the deep well can influence water chemistry within the shallow well, resulting in less representative in-situ measurements and lower QAQC rankings. In addition, differences between grab sample analysis and in-situ measurements, as well as natural groundwater variability can all contribute to lower QAQC rankings.

Some QAQC rankings and comparisons were unavailable during the monitoring season due to operational and site-specific challenges. In several wells, insufficient recharge following purging prevented the collection of stabilization measurements or delayed deployment activities. Additionally, occasional pump malfunctions during well purging and isolated sonde malfunctions identified during deployment or retrieval resulted in incomplete QAQC datasets for certain stations. These instances were limited and did not affect the overall interpretation of groundwater quality trends or the assessment of monitoring program performance.

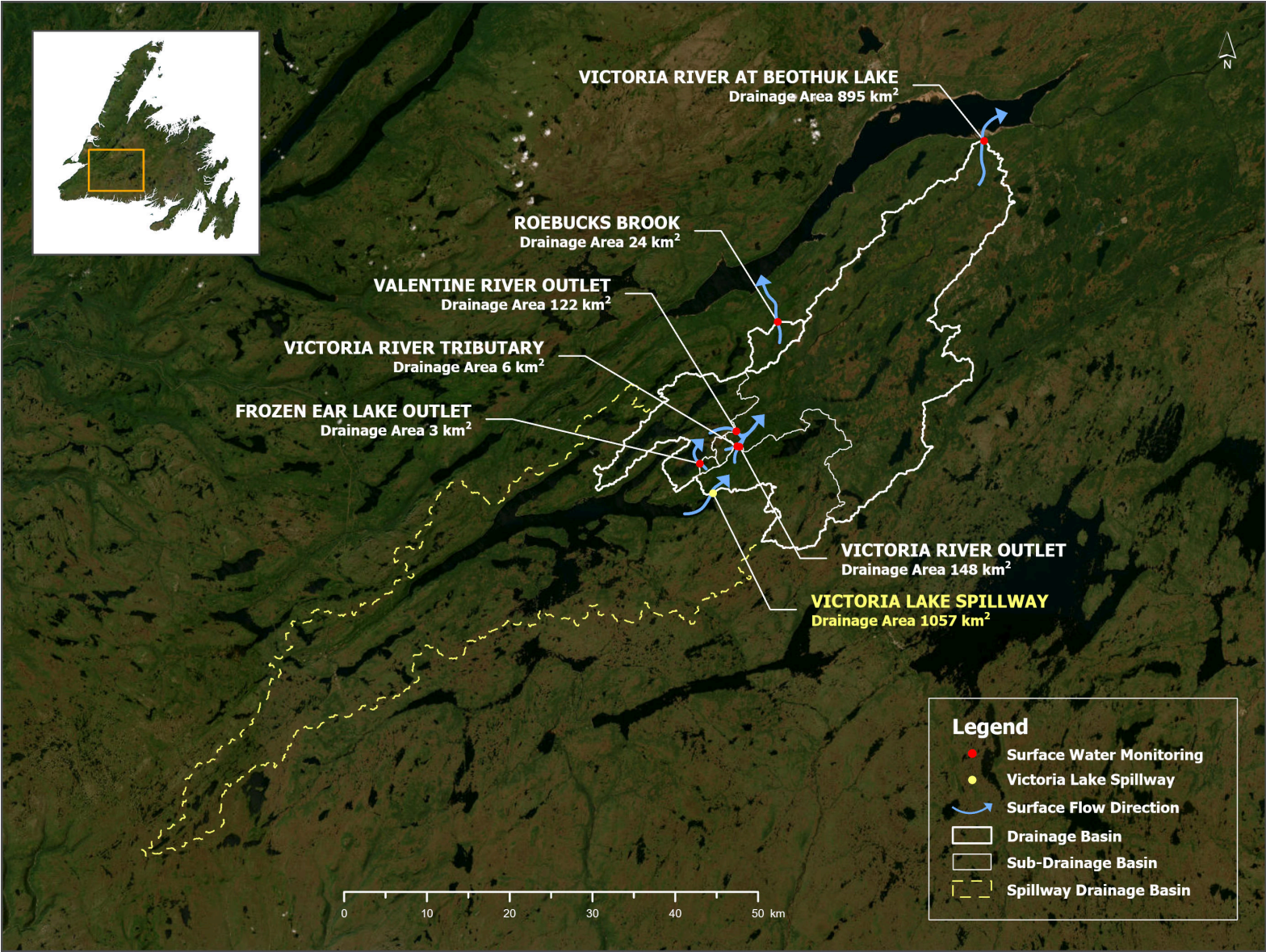
Groundwater QAQC Rankings

QAQC Rankings - April			
Station	Parameter	Deployment Ranking	Removal Ranking
▲			
Berry Pit Deep	pH	Fair	Excellent
Berry Pit Deep	Specific Conductivity (µS/cm)	Excellent	Good
Berry Pit Shallow	pH	Marginal	Excellent
Berry Pit Shallow	Specific Conductivity (µS/cm)	Excellent	Fair
Northwest of Leprechaun Pit	Specific Conductivity (µS/cm)	Excellent	Excellent
Northwest of Leprechaun Pit	pH	Poor	Fair
South of Leprechaun Waste Rock Pile	Specific Conductivity (µS/cm)	Marginal	Poor
South of Leprechaun Waste Rock Pile	pH	Poor	Poor
South of Marathon Waste Rock Pile	Specific Conductivity (µS/cm)	Excellent	Excellent
South of Marathon Waste Rock Pile	pH	Fair	Good
Southeast of TMF Deep	Specific Conductivity (µS/cm)	Excellent	Good
Southeast of TMF Deep	pH	Good	Good
Southeast of TMF Shallow	pH	Poor	Good
Southeast of TMF Shallow	Specific Conductivity (µS/cm)	Excellent	Poor
Southwest of Marathon Pit	pH	Excellent	Excellent
Southwest of Marathon Pit	Specific Conductivity (µS/cm)	Excellent	Fair

QAQC Rankings - July			
Station	Parameter	Deployment Ranking	Removal Ranking
▲			
Berry Pit Deep	Specific Conductivity (µS/cm)	Excellent	Excellent
Berry Pit Deep	pH	Good	Excellent
Berry Pit Shallow	pH	Fair	Excellent
Berry Pit Shallow	Specific Conductivity (µS/cm)	Good	Good
Northwest of Leprechaun Pit	Specific Conductivity (µS/cm)	Good	Fair
Northwest of Leprechaun Pit	pH	Marginal	Fair
South of Leprechaun Waste Rock Pile	pH	-	-
South of Leprechaun Waste Rock Pile	Specific Conductivity (µS/cm)	-	-
South of Marathon Waste Rock Pile	pH	-	Excellent
South of Marathon Waste Rock Pile	Specific Conductivity (µS/cm)	Fair	Good
Southeast of TMF Deep	pH	Fair	Good
Southeast of TMF Deep	Specific Conductivity (µS/cm)	Good	Good
Southeast of TMF Shallow	pH	Marginal	Good
Southeast of TMF Shallow	Specific Conductivity (µS/cm)	Poor	Marginal
Southwest of Marathon Pit	pH	Excellent	Good
Southwest of Marathon Pit	Specific Conductivity (µS/cm)	Good	Good

QAQC Rankings - October			
Station	Parameter	Deployment Ranking	Removal Ranking
▲			
Berry Pit Deep	pH	-	Excellent
Berry Pit Deep	Specific Conductivity (µS/cm)	-	Excellent
Berry Pit Shallow	Specific Conductivity (µS/cm)	Excellent	Excellent
Berry Pit Shallow	pH	Fair	Good
Northwest of Leprechaun Pit	pH	-	Fair
Northwest of Leprechaun Pit	Specific Conductivity (µS/cm)	-	Poor
South of Leprechaun Waste Rock Pile	pH	Marginal	Excellent
South of Leprechaun Waste Rock Pile	Specific Conductivity (µS/cm)	Excellent	Fair
South of Marathon Waste Rock Pile	pH	Good	Excellent
South of Marathon Waste Rock Pile	Specific Conductivity (µS/cm)	Fair	Good
Southeast of TMF Deep	pH	Poor	Good
Southeast of TMF Deep	Specific Conductivity (µS/cm)	Poor	Good
Southeast of TMF Shallow	pH	Poor	Excellent
Southeast of TMF Shallow	Specific Conductivity (µS/cm)	Excellent	Poor
Southwest of Marathon Pit	pH	-	-
Southwest of Marathon Pit	Specific Conductivity (µS/cm)	-	-

Valentine Gold Mine: Surface Water Network



Equinox Gold’s Valentine Gold Mine real-time monitoring network includes six surface water stations. These stations play a critical role in environmental management by enabling early detection of potential contamination and providing insight into water quality and quantity. The integration of real-time monitoring allows for rapid response and early mitigation in the event of any contamination concerns.

Victoria River Outlet, Valentine River Outlet, and Roebucks Brook water quality stations were installed in November 2022. Victoria River Tributary was installed in November 2023. Frozen Ears Lake Outlet and Victoria River at Beothuk Lake were both installed in June 2024. Please refer to Appendix I for full site descriptions.

Station Name	Station Number	Latitutde	Longitude
Frozen Ear Lake Outlet	NF02YN0052	48.3877	-57.1387
Victoria River Outlet	NF02YN0047	48.4080	-57.0724
Victoria River Tributary	NF02YN0050	48.4083	-57.0765
Valentine River Outlet	NF02YN0048	48.4242	-57.0775
Roebucks Brook	NF02YN0049	48.5436	-57.0131
Victoria River at Beothuk Lake	NF02YN0051	48.7434	-56.6776

Surface Water - Temperature



Water Temperature Annual Statistics (°C)				
Station Name	Minimum	Maximum	Average	Median
Frozen Ears Lake Outlet	0.04	32.00	12.39	13.39
Roebucks Brook	-0.09	27.27	12.12	12.79
Valentine River Outlet	-0.14	28.94	12.07	12.69
Victoria River at Beothuk Lake	-0.05	29.12	13.45	14.40
Victoria River Outlet	-0.08	27.11	12.33	12.90
Victoria River Tributary	-0.14	25.96	11.77	12.69

Water temperature is a critical parameter for wildlife, as many organisms cannot regulate their own body temperatures and instead depend on surrounding air and water conditions. Water temperature can be influenced by industrial inputs or alterations to natural environments, such as the removal of trees and vegetation, which eliminates the protective canopy they provide. Additionally, water temperature impacts other monitored parameters, including dissolved oxygen and specific conductivity.

From April to December, water temperature data across all six stations exhibited expected seasonal and diurnal trends. Graphs show a clear pattern of rising temperatures in spring, peaking in mid-summer, followed by a gradual decline during the transition to fall.

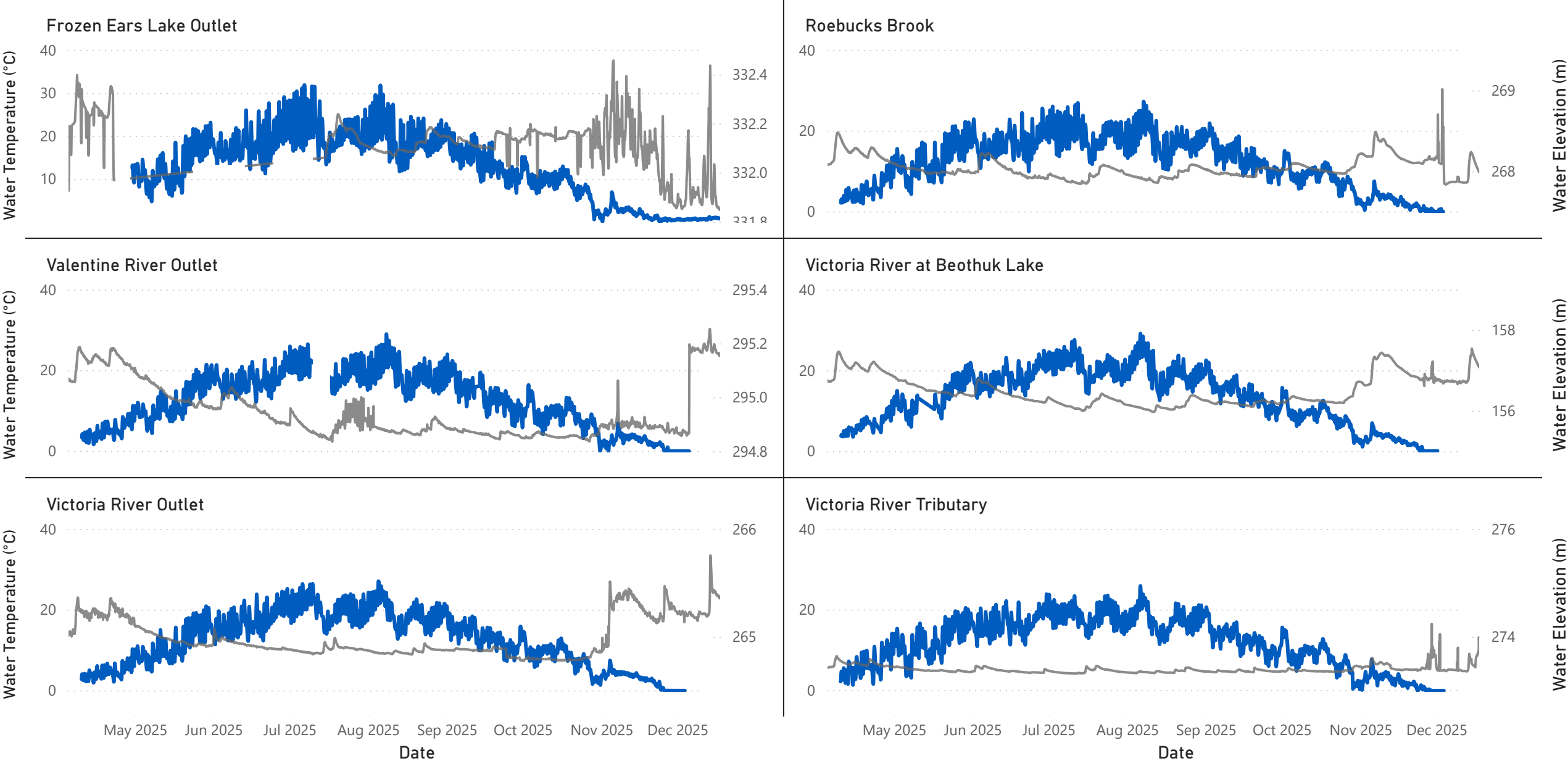
Median temperatures were comparable across all stations. Slightly elevated temperatures were observed at Victoria River at Beothuk Lake. Frozen Ears Lake Outlet recorded higher maximum temperatures, which can be explained by the shallow nature of the outlet and the absence of canopy cover, making it more susceptible to atmospheric warming and direct solar radiation.

Water Temperature Station Graphs



Temperature (°C) and Water Elevation (m)

● Water Temperature (°C) ● Water Elevation (m)



Surface Water - pH

Annual pH Statistics (pH Units)				
Station Name	Minimum	Maximum	Average	Median
Frozen Ears Lake Outlet	6.65	8.43	7.40	7.39
Roebucks Brook	5.66	7.68	6.78	6.88
Valentine River Outlet	6.51	7.44	6.95	6.96
Victoria River at Beothuk Lake	5.78	7.68	7.02	7.08
Victoria River Outlet	6.16	8.40	6.95	6.98
Victoria River Tributary	6.58	8.09	7.55	7.57

pH relates to the free hydrogen ions in water, and it is a measure of acidity in water. pH is a critical parameter because it influences the solubility of minerals and chemicals, the availability of nutrients, and the biological processes that occur in aquatic ecosystems. The Canadian Council of Ministers of the Environment (CCME) Freshwater Aquatic Life guideline provides a basis by which to judge the overall health of the brook. The freshwater guidelines recommend a minimum pH of 6.5 and a maximum pH of 9.0; however, many rivers in Newfoundland and Labrador are naturally more acidic due to the local geology.

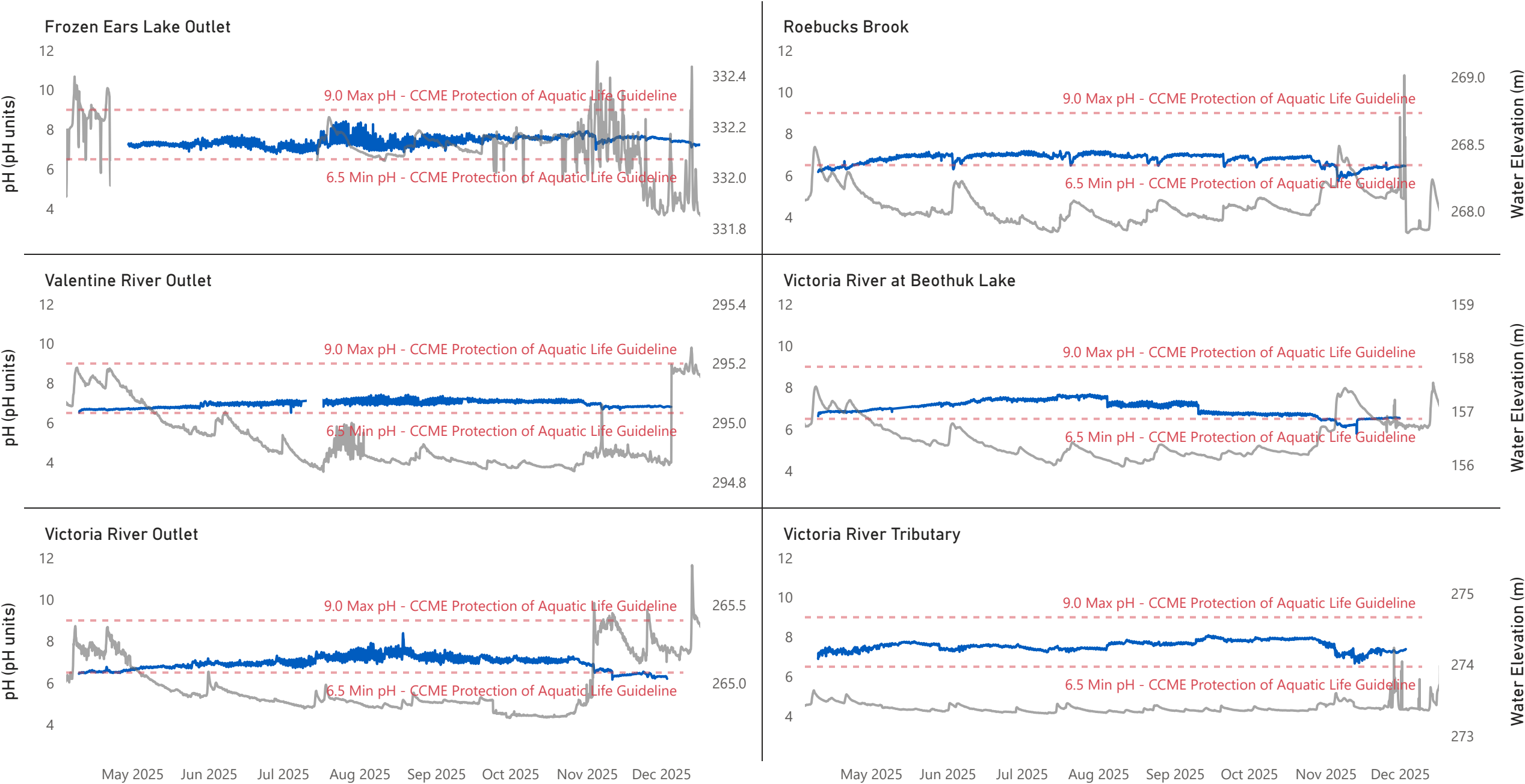
Across all six stations, pH remained generally stable and consistent throughout the deployment season. Median values were similar among stations, though the Victoria River Tributary exhibited slightly higher pH levels compared to the others. pH stayed within the CCME guideline range for most of the season at all sites, with only occasional brief dips below the minimum threshold.

Precipitation events influenced pH across all stations. Rainwater, being naturally acidic, can temporarily lower pH, while runoff may increase pH by mobilizing sediment or organic material. These effects were short-lived, with pH typically returning to background levels within days to weeks. A distinct decrease in pH occurred around mid-November at all stations, coinciding with a rise in water elevation. This pattern aligns with a significant precipitation event during that period, which likely diluted the water column and altered chemical conditions. Following this event, pH gradually returned toward typical seasonal levels.

Frozen Ears Lake Outlet showed the most pronounced short-term fluctuations, particularly in mid- to late summer. This station’s shallow, slow-moving, and vegetation-sparse environment makes it more responsive to changes in air temperature and sunlight exposure, conditions that can intensify photosynthesis, respiration, and algal activity and lead to noticeable diurnal swings in pH.

Surface Water pH Station Graphs

● pH (pH units) ● Water Elevation (m)



Surface Water - Specific Conductivity

Annual Specific Conductivity Statistics (µS/cm)

Station Name	Minimum	Maximum	Average	Median
Frozen Ears Lake Outlet	43.20	104.80	75.50	81.01
Roebucks Brook	15.44	116.40	32.81	32.87
Valentine River Outlet	20.70	33.06	27.64	27.95
Victoria River at Beothuk Lake	11.01	43.55	30.17	33.49
Victoria River Outlet	20.55	80.48	34.18	32.31
Victoria River Tributary	22.78	179.18	110.89	114.24

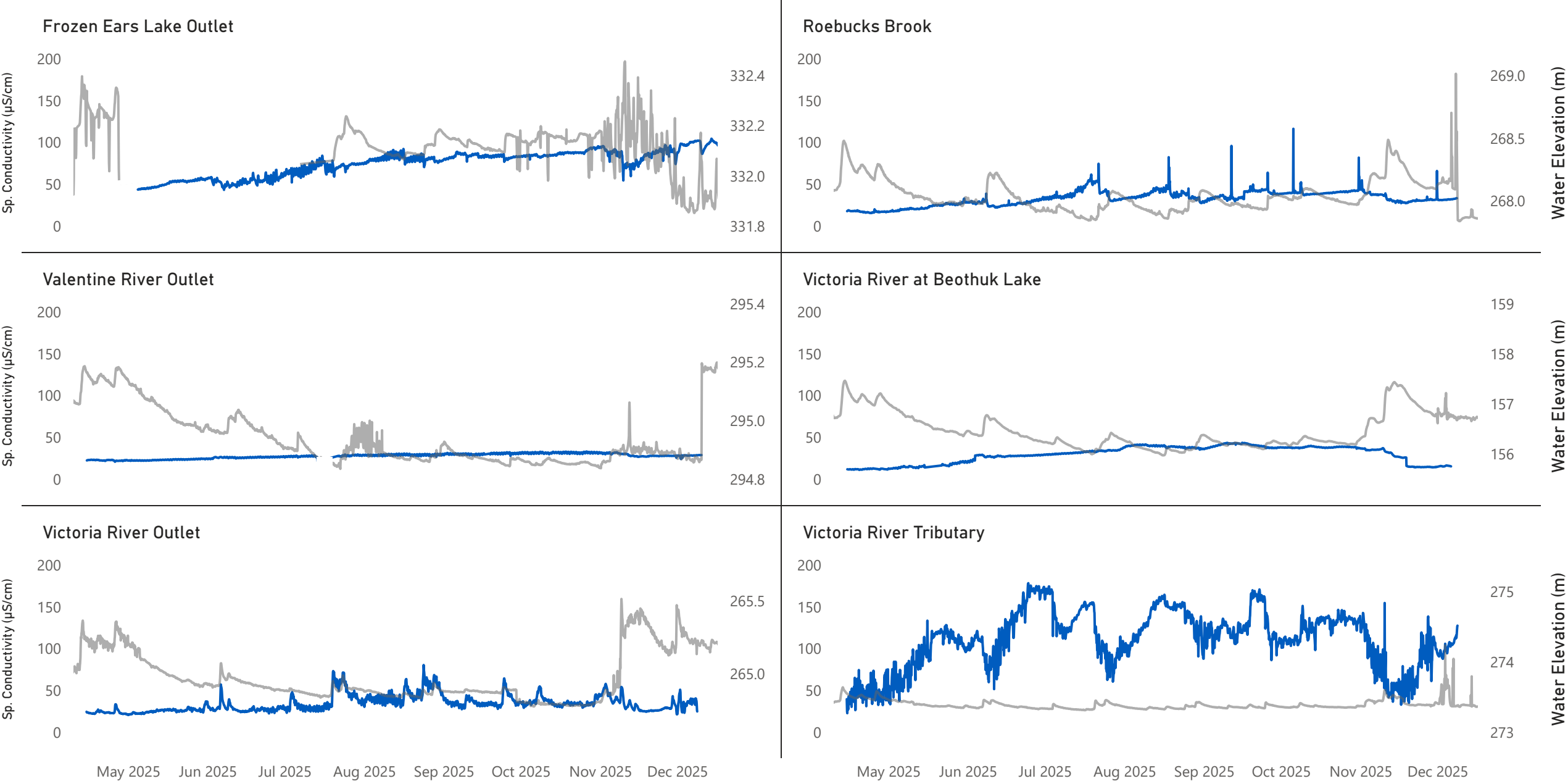
Specific conductivity is a common indicator of the concentration of dissolved ions in water, such as salts, nutrients and metals. Higher concentrations of dissolved ions result in higher specific conductivity, while pure water exhibits low conductivity. Specific conductivity is often affected by precipitation. During precipitation events, rainwater can temporarily dilute the water column, resulting in a short-term decrease in conductivity. However, high precipitation events can also cause a temporary increase in conductivity if sediment from the bottom of the waterbody is disturbed around the sensor or if runoff carrying dissolved ions enters the water column.

Specific conductivity remained generally low across all six stations throughout the deployment period, indicating low dissolved ion concentrations and relatively undisturbed conditions. Most stations showed slight gradual seasonal increases through the summer, likely reflecting concentration effects during lower flows, followed by declines in late fall associated with increased precipitation and dilution.

Frozen Ears Lake Outlet and Roebucks Brook exhibited slight upward summer trends with increased variability during periods of changing water levels. Roebucks Brook displayed periodic short-lived spikes, likely attributed to increased inputs of dissolved ions from localized runoff. Valentine River Outlet maintained consistently low and stable conductivity. Victoria River Tributary recorded the highest conductivity values and greatest variability, particularly from June to October, likely due to its small size and surrounding wetland and boggy terrain, which increase sensitivity to hydrologic change. Victoria River at Beothuk Lake showed a gradual summer increase followed by a pronounced drop in late October that coincided with rising water elevation, indicating dilution from a major precipitation event. In contrast, Victoria River Outlet showed several conductivity increases that coincided with rising water elevations. This response differs from the dilution patterns observed at other stations. The sonde's placement near an embankment and within a soft, muddy substrate may increase susceptibility to sediment disturbance and runoff inputs during high-flow events, resulting in elevated conductivity during periods of increased water elevation.

Specific Conductivity Station Graphs

● Specific Conductivity (µS/cm) ● Water Elevation (m)



Surface Water - Dissolved Oxygen

Annual Dissolved Oxygen Statistics								
Station Name	Minimum (mg/L)	Minimum (% Sat.)	Maximum (mg/L)	Maximum (% Sat.)	Average (mg/L)	Average (% Sat.)	Median (mg/L)	Median (% Sat.)
Frozen Ears Lake Outlet	4.90	53.00	15.11	157.80	10.86	99.44	10.64	99.10
Roebucks Brook	6.33	70.00	14.97	111.60	10.98	100.12	10.59	100.50
Valentine River Outlet	7.75	93.30	14.97	109.60	11.04	100.51	10.57	100.10
Victoria River at Beothuk Lake	8.10	101.60	16.35	112.20	11.39	106.88	10.85	106.80
Victoria River Outlet	7.66	88.40	15.06	127.30	11.33	103.87	11.06	102.90
Victoria River Tributary	6.97	77.40	17.37	121.20	11.48	103.34	10.76	101.30

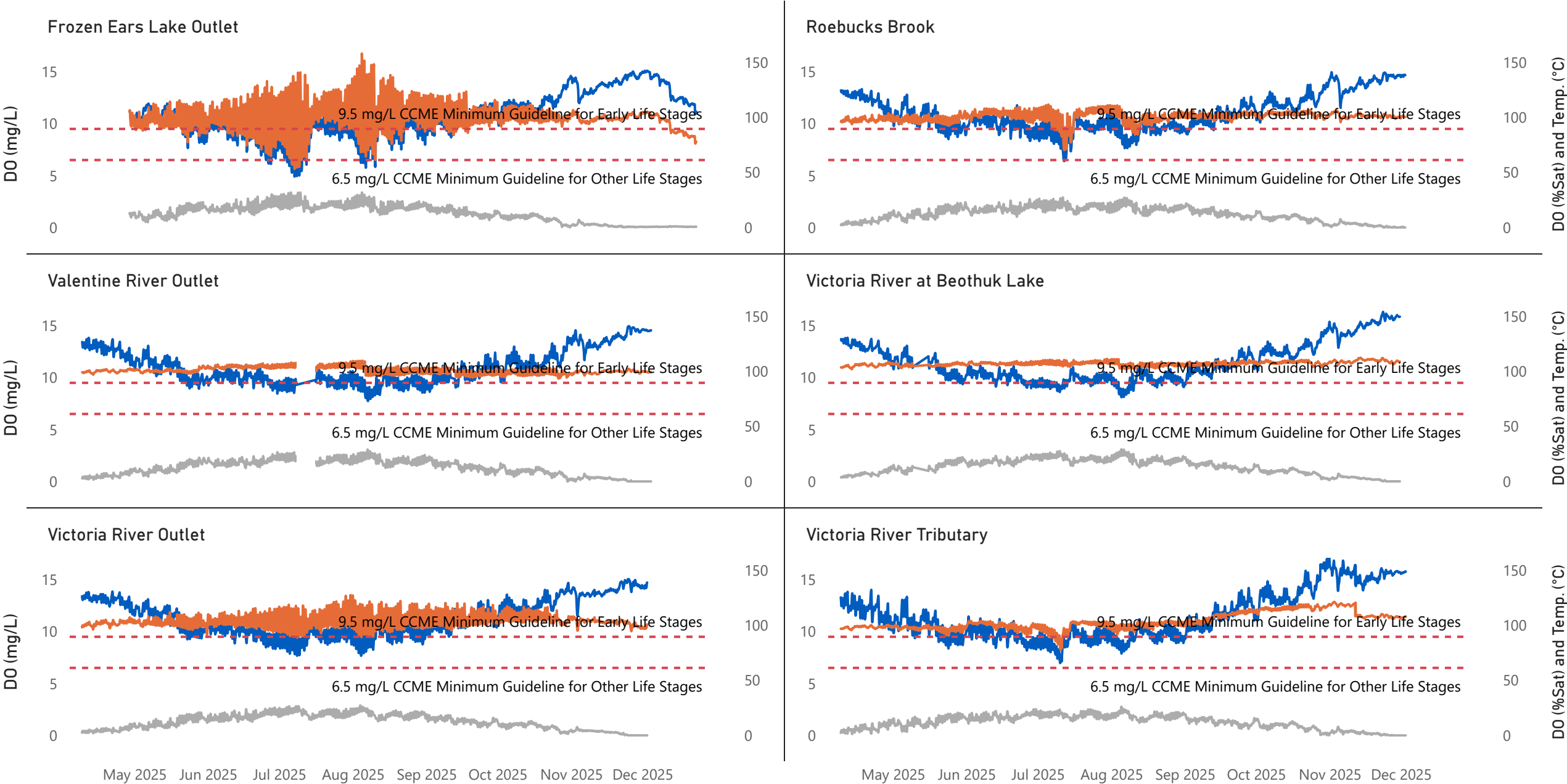
Dissolved oxygen (DO) is crucial for supporting aquatic life, and the CCME (Canadian Council of Ministers of the Environment) Freshwater Aquatic Life guidelines establish reference values to evaluate waterway health. The minimum DO guideline is 9.5 mg/L for early life stages in cold water species and 6.5 mg/L for other life stages. DO concentrations can fluctuate due to factors such as water temperature, atmospheric pressure, and the presence of other dissolved substances. Warmer water typically holds less dissolved oxygen than cooler water.

Dissolved oxygen concentrations across all six stations generally remained within acceptable ranges throughout the deployment period, with most observations staying above the CCME minimum guidelines for both early life stages (9.5 mg/L) and other life stages (6.5 mg/L). DO exhibited clear seasonal patterns, with higher concentrations in spring and late fall and lower values during the summer months, reflecting the influence of increasing water temperatures on oxygen solubility. Summer declines were most pronounced from July through August, when warmer temperatures coincided with reduced DO concentrations at several stations.

The Frozen Ears Lake Outlet station is an exposed area with no vegetation cover, characterized by shallow, slow-moving water, and is particularly sensitive to air temperature changes. Additionally, DO at this station may be influenced by reduced aeration and/or stagnant pools of water due to low water levels, as well as potentially significant biological activity during the summer. These conditions led to pronounced diurnal variations in DO levels, as illustrated in the figure on the next page.

Dissolved Oxygen Station Graphs

● DO (mg/L) ● Water Temperature (°C) ● Percent Saturation



Surface Water - Turbidity



Annual Turbidity Statistics (NTU)					
Station Name	Correction Value	Minimum	Maximum	Average	Median
Frozen Ears Lake Outlet	+0.30	0.00	275.53	7.26	0.75
Roebucks Brook	+0.26	0.00	1,101.80	4.81	2.34
Valentine River Outlet	+0.68	0.00	61.68	0.43	0.22
Victoria River at Beothuk Lake	+1.17	0.00	7.98	1.64	1.68
Victoria River Outlet	+0.42	0.00	19.15	0.57	0.29
Victoria River Tributary	+0.79	0.00	36.18	2.04	0.55

Turbidity, a measure of the cloudiness or clarity of water, can be a key indicator of water quality and overall ecosystem health. High turbidity levels can reduce light penetration for aquatic plants, disrupt benthic habitats and potentially harm fish gills or damage monitoring equipment. Turbidity often increases during precipitation events as runoff carries silt and debris into the waterbody.

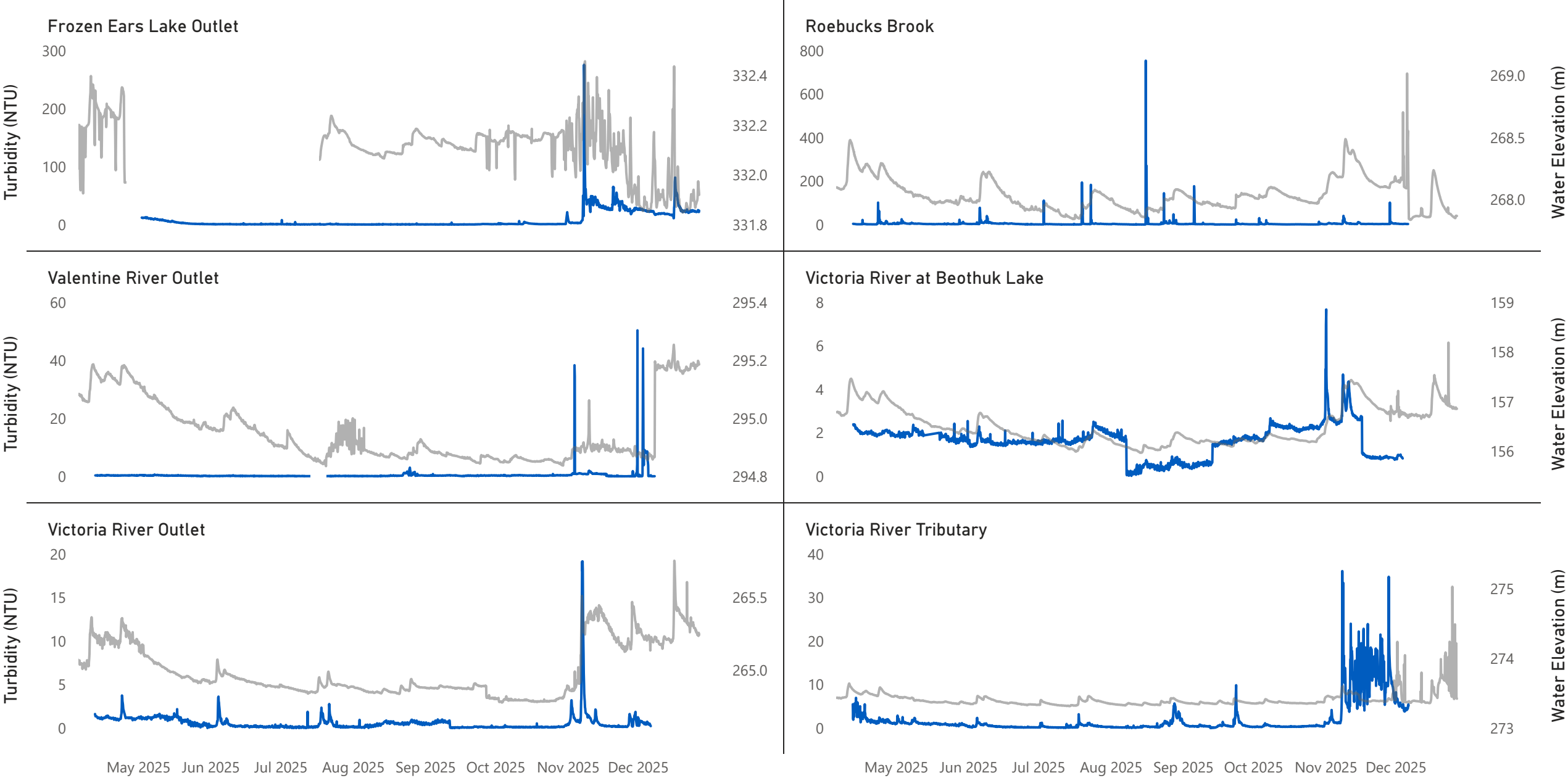
Throughout the deployment season, turbidity remained generally low and stable at most stations, with occasional short-term spikes corresponding to precipitation events or changes in water elevation. Median turbidity values were comparable across stations, though Roebucks Brook was slightly higher. Roebucks Brook is located downstream from a gravel access road, where rainfall events generate silt-laden runoff that temporarily elevates turbidity. In most cases, turbidity levels returned to background conditions within days to weeks after each precipitation event. Roebucks Brook and Frozen Ears Lake Outlet also exhibited notably higher peaks than other sites, reflecting localized conditions and differences in scale. A substantial decrease in turbidity was observed at the Victoria River at Beothuk Lake station in mid-August, coinciding with a routine instrument changeout. This abrupt shift is likely attributable to calibration differences between the previously deployed sonde and the newly deployed instrument. While the absolute turbidity values during this period may not be directly comparable, the data was retained in the dataset to support evaluation of overall temporal trends and relationships with other environmental parameters.

Across all stations, the most pronounced turbidity increases occurred around late October to early November, coinciding with a major precipitation event that elevated water levels and likely disturbed sediments. Following these events, turbidity values gradually returned to baseline. Occasional negative turbidity values were observed when turbidity measurements fell below the instrument's calibration zero standard. Although negative turbidity values are not representative of actual environmental conditions, they were retained in the dataset to allow for assessment of relative trends over time and comparison with water levels and other water quality parameters. For analysis and reporting purposes, a correction was applied to each station dataset with negative values by offsetting values so that the lowest recorded turbidity measurement was equal to zero. The correction values applied to each station are shown in the table above.

Turbidity Station Graphs

● Turbidity (NTU) ● Water Elevation (m)

Please note change in scale on Roebucks and Frozen Ears graphs



Surface Water Elevation



Annual Water Elevation Statistics (m)					
Station Name	Minimum	Maximum	Range	Average	Median
Frozen Ears Lake Outlet	331.85	332.46	0.61	332.08	332.11
Roebucks Brook	267.84	269.21	1.37	268.07	268.04
Valentine River Outlet	294.83	295.89	1.05	294.99	294.97
Victoria River at Beothuk Lake	155.97	158.63	2.65	156.63	156.66
Victoria River Outlet	264.78	265.79	1.02	265.05	265.03
Victoria River Tributary	273.31	275.43	2.12	273.44	273.39

Water elevation provides an estimate of the water level at a monitoring station and plays a vital role in analyzing trends in water quality data, particularly for parameters such as specific conductivity, pH, and turbidity. Water elevation generally rises during precipitation events as rainwater and runoff enter the water column. By monitoring water elevation alongside rainfall data, we gain clearer insight into whether changes are driven by natural precipitation or potential industrial influences, and how these shifts may affect overall water quality. Precipitation data was obtained from the Valentine Gold Mine (Marathon Gold) meteorological (MET) station, which is located on-site and maintained collaboratively by WRMD and Equinox Gold.

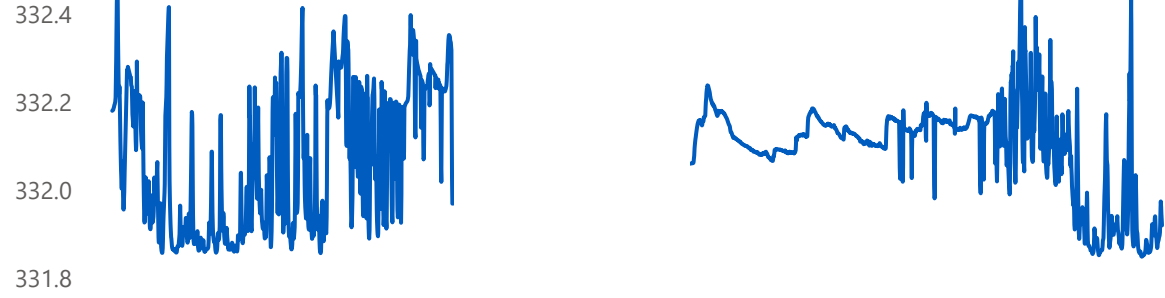
The graphs on the following page show water elevation data from January 1st to December 31st, 2025. Water elevation at all six stations varied throughout the year. A slight decline was observed during the summer months, likely due to unusually high air temperatures and limited rainfall. The lowest water levels were recorded around late September to October, followed by a gradual increase and greater fluctuations from November onward as precipitation events became more frequent. The station graphs on the following page illustrate how precipitation events influenced water elevation, with clear spikes in elevation occurring during or shortly after rainfall.

Due to transmission issues experienced at the station, there is a gap of missing data observed at Frozen Ears Lake Outlet from the end of April to mid-July.

Water Elevation Station Graphs

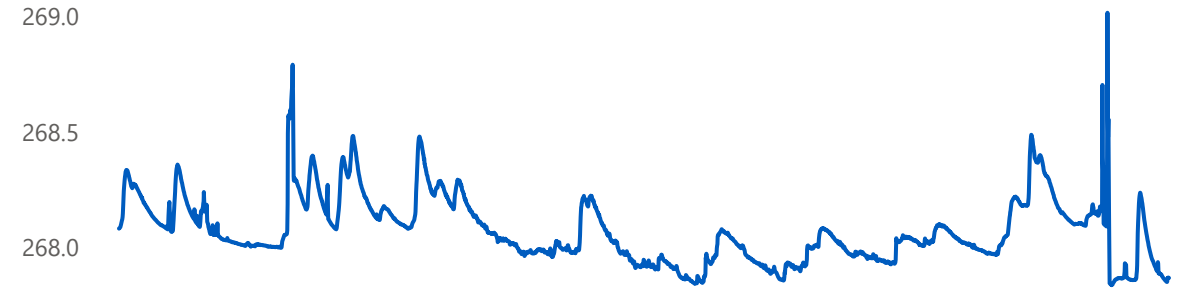
Frozen Ears Lake Outlet

Water Elevation (m)



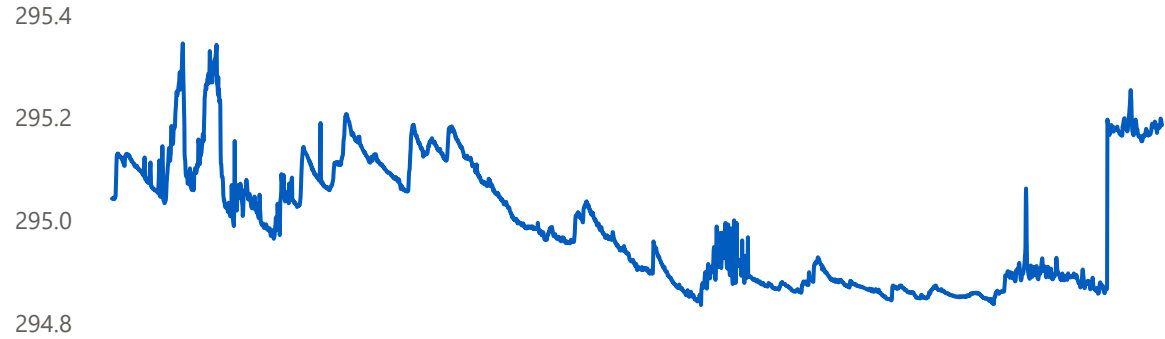
Roebucks Brook

Water Elevation (m)



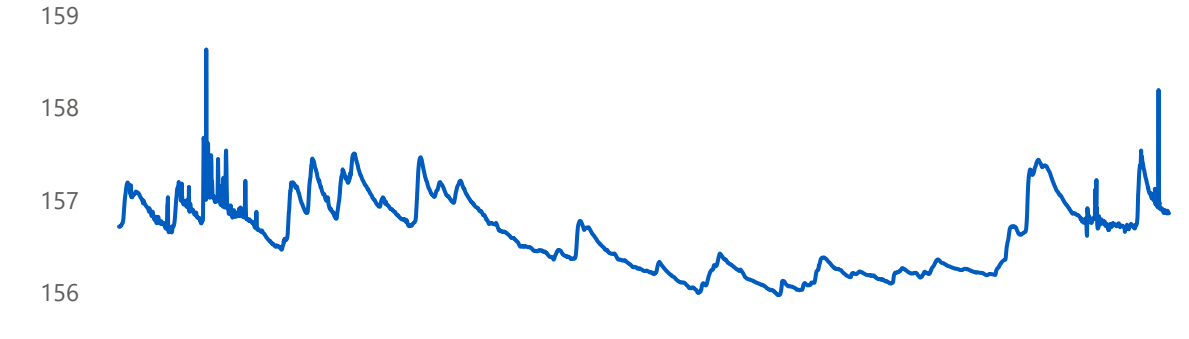
Valentine River Outlet

Water Elevation (m)



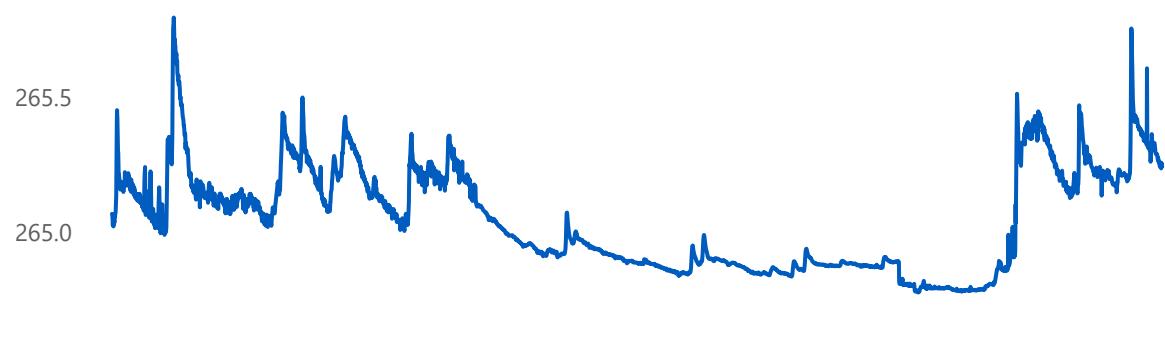
Victoria River at Beothuk Lake

Water Elevation (m)



Victoria River Outlet

Water Elevation (m)



Victoria River Tributary

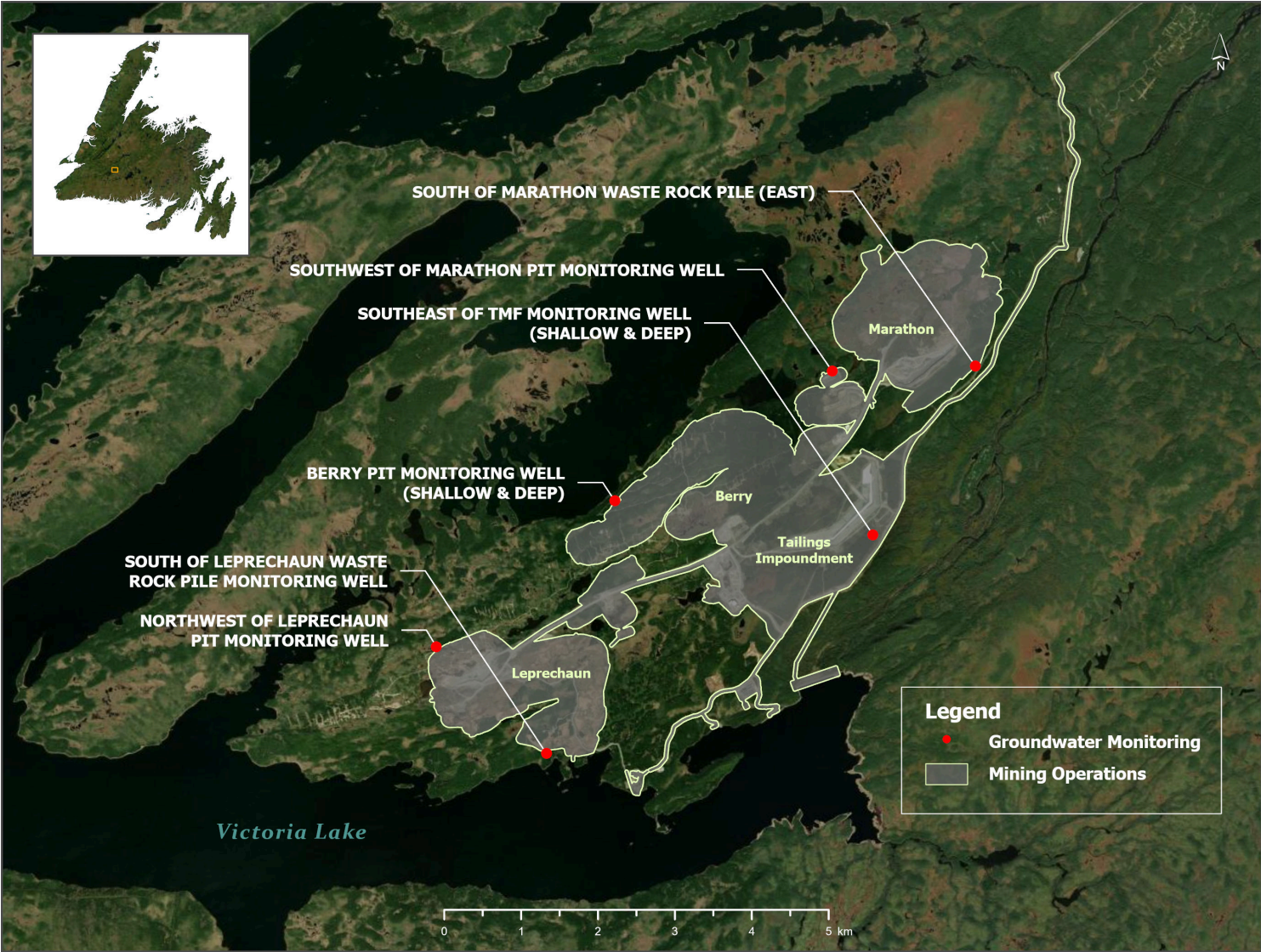
Water Elevation (m)



Jan 2025 Mar 2025 May 2025 Jul 2025 Sep 2025 Nov 2025 Dec 2025

Jan 2025 Mar 2025 May 2025 Jul 2025 Sep 2025 Nov 2025 Dec 2025

Valentine Gold Mine: Groundwater Network



Equinox Gold's real-time monitoring network includes eight groundwater monitoring wells located across the site. These wells play a critical role in environmental management by enabling early detection of potential contamination, providing insight into groundwater flow patterns and water levels, and supporting regulatory compliance. The integration of real-time monitoring allows for rapid response and early mitigation in the event of any contamination concerns.

Two stations - Southeast of TMF (Tailings Management Facility) and Berry Pit - are equipped with both shallow and deep groundwater monitoring wells. This setup is beneficial as it provides a more comprehensive understanding of vertical groundwater conditions, enables earlier detection of potential contamination in the shallow zones, and helps evaluate the effectiveness of mitigation measures at different depths.

Northwest of Leprechaun Pit, South of Leprechaun Waste Rock Pile, and Southeast of TMF (deep and shallow) were all installed in 2023. South of Marathon Waste Rock Pile (East) and Southwest of Marathon Pit were installed in June 2024. Berry Pit (deep and shallow) was installed November 2024. Please refer to Appendix I for full site descriptions.

Station #	Station Name	Latitude	Longitude
NLGWMG01	South of Leprechaun Waste Rock Pile Monitoring Well	48.347240	-57.166490
NLGWMG02	Northwest of Leprechaun Pit Monitoring Well	48.359530	-57.186130
NLGWMG03	Southeast of TMF Monitoring Well (Deep)	48.373520	-57.109760
NLGWMG04	Southeast of TMF Monitoring Well (Shallow)	48.373520	-57.109760
NLGWMG05	South of Marathon Waste Rock Pile (East)	48.393358	-57.092236
NLGWMG06	Southwest of Marathon Pit - Monitoring Well	48.392156	-57.118278
NLGWMG07	Berry Pit Monitoring Well (Shallow)	48.376972	-57.155272
NLGWMG08	Berry Pit Monitoring Well (Deep)	48.376972	-57.155272

Groundwater - Temperature



Annual Groundwater Temperature Statistics (°C)				
Station Name	Median	Average	Minimum	Maximum
Berry Pit (Deep)	5.40	5.40	5.34	5.45
Berry Pit (Shallow)	5.77	6.14	2.49	9.30
Northwest of Leprechaun Pit	5.95	5.92	3.97	8.70
South of Leprechaun Waste Rock Pile	6.47	6.50	5.38	7.92
South of Marathon Waste Rock Pile (East)	5.71	5.56	3.69	6.03
Southeast of TMF (Deep)	5.49	5.49	5.42	5.78
Southeast of TMF (Shallow)	6.24	6.26	4.63	8.02

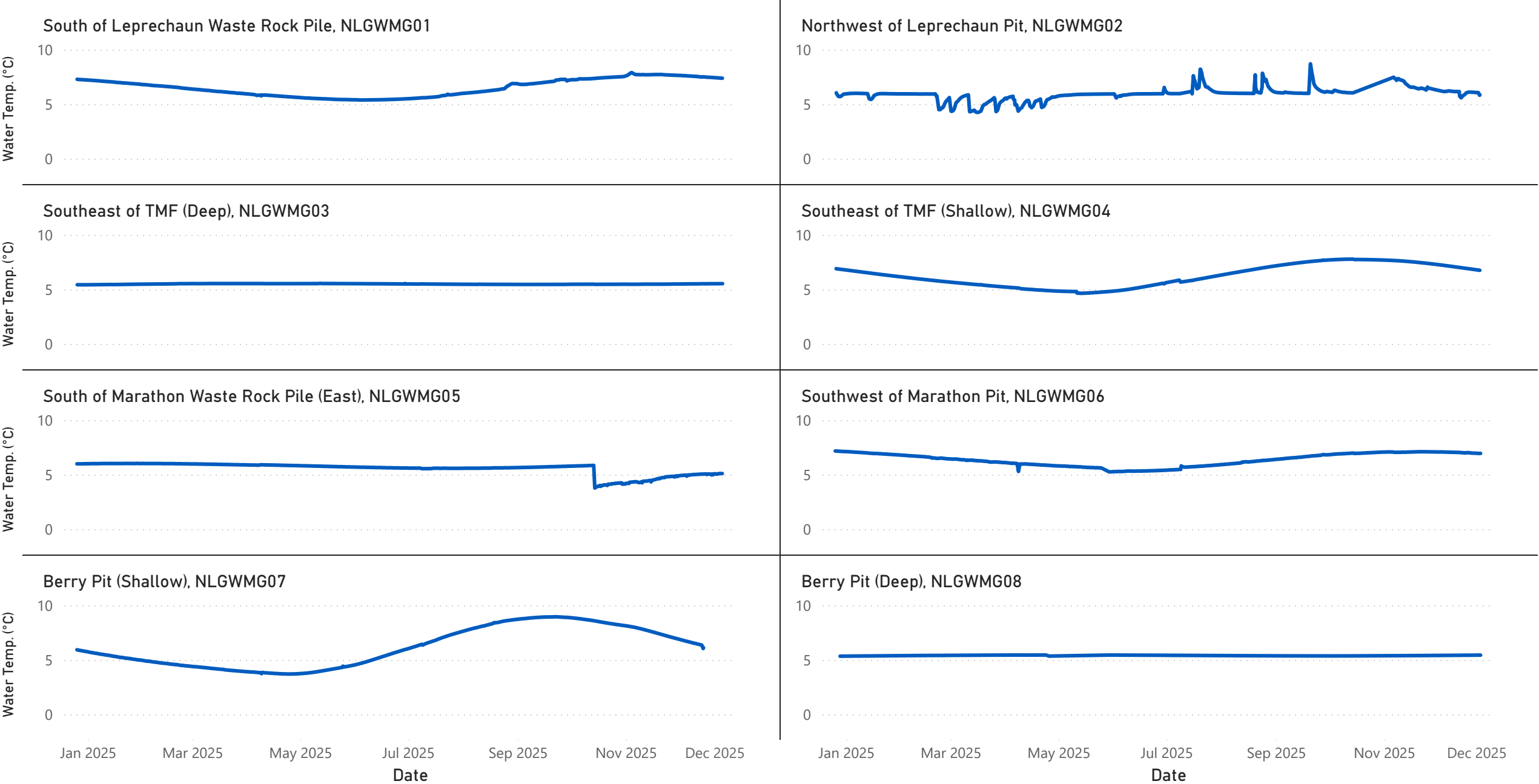
Groundwater temperature is typically stable and consistent, as it is generally unaffected by external environmental factors. However, monitoring groundwater temperature is important, as even small variations can have significant impacts on biological, chemical, and physical processes.

At most of the groundwater monitoring well (MW) stations, temperatures remained stable throughout the year. Generally, the lowest temperatures were observed during late-spring, with a slight increase noted in the late-summer to fall. This is because groundwater temperature typically lags behind surface air temperature, as soil and rock act as natural insulators, slowing the transfer of heat. These seasonal variations were more noticeable at shallow wells, such as Berry Pit (shallow), South of Leprechaun Waste Rock Pile and Southeast of TMF (shallow), where groundwater flow is more dynamic and more easily influenced by surface conditions. In contrast, deeper wells, such as Southeast of TMF (deep), demonstrated more consistent temperatures.

Northwest of Leprechaun Pit MW shows more variability than expected for its depth (~26 m), suggesting it is not fully thermally buffered. Its location near the Leprechaun Pit potentially results in active groundwater mixing and influence from disturbed flow conditions. This could allow periodic inputs of water at different temperatures, leading to short-term fluctuations rather than a smooth seasonal trend.

Groundwater - Water Temperature Graphs

Temperature (°C) and Water Elevation (m)



Groundwater -pH



Annual pH Statistics (pH Units)				
Station Name	Median	Average	Minimum	Maximum
Berry Pit (Deep)	7.76	7.78	7.39	7.90
Berry Pit (Shallow)	7.84	7.82	7.00	8.07
Northwest of Leprechaun Pit	6.01	5.97	4.69	6.82
South of Leprechaun Waste Rock Pile	5.66	6.09	5.42	7.86
South of Marathon Waste Rock Pile (East)	7.73	7.75	7.46	7.94
Southeast of TMF (Deep)	7.65	7.61	7.10	7.73
Southeast of TMF (Shallow)	7.29	7.24	6.44	7.47
Southwest of Marathon Pit	8.15	8.12	7.38	8.40

pH is a measure of acidity that reflects the concentration of free hydrogen ions in water. It plays a key role in determining the mobility of heavy metals and other contaminants in groundwater. When pH levels become too acidic or too alkaline, harmful substances can dissolve more easily and migrate through groundwater channels, potentially impacting nearby ecosystems. Regular monitoring of pH in groundwater wells is important for detecting early signs of contamination or geochemical shifts, and for maintaining compliance with environmental regulations.

Throughout the year, groundwater pH remained generally stable across all monitoring wells, typically within neutral to slightly alkaline ranges (approximately 6 to 8 pH units). Minor fluctuations were observed throughout the year and no strong seasonal pattern evident at most locations. Wells near mining activities, such as South of Leprechaun Waste Rock Pile and Northwest of Leprechaun Pit, exhibited slightly more acidic values and moderate variability, likely reflecting localized mixing and site-related influences, though overall pH conditions remained relatively stable. Shallow wells, including Southeast of TMF (shallow) and Berry Pit (shallow), also showed small fluctuations, likely due to influence from surface recharge or well purging activities to collect grab samples and switch-out the instrument. In contrast, deeper wells, such as Southeast of TMF (deep) and Berry Pit (deep), remained highly consistent throughout the year. Overall, pH conditions across the site were stable, with only localized and short-term variability.

Groundwater - pH Station Graphs



South of Leprechaun Waste Rock Pile, NLGWMG01



Northwest of Leprechaun Pit, NLGWMG02



Southeast of TMF (Deep), NLGWMG03



Southeast of TMF (Shallow), NLGWMG04



South of Marathon Waste Rock Pile (East), NLGWMG05



Southwest of Marathon Pit, NLGWMG06



Berry Pit (Shallow), NLGWMG07



Berry Pit (Deep), NLGWMG08



Jan 2025 Mar 2025 May 2025 Jul 2025 Sep 2025 Nov 2025 Dec 2025

Jan 2025 Mar 2025 May 2025 Jul 2025 Sep 2025 Nov 2025 Dec 2025

Groundwater - Specific Conductivity

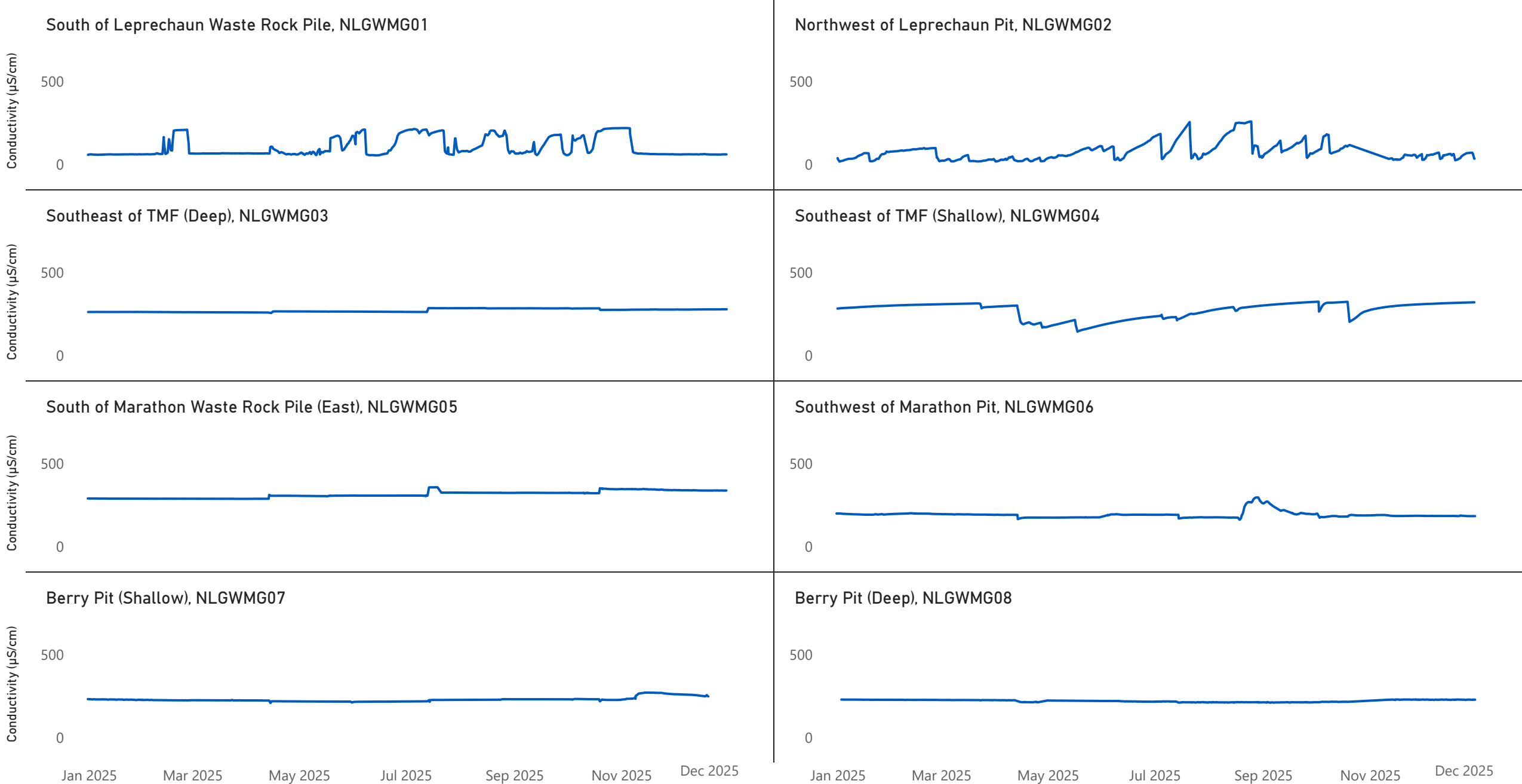
Annual Specific Conductivity Statistics (µS/cm)				
Station Name	Median	Average	Minimum	Maximum
Berry Pit (Deep)	218.12	220.14	209.55	288.85
Berry Pit (Shallow)	226.49	228.84	192.53	278.65
Northwest of Leprechaun Pit	63.21	74.58	15.41	261.38
South of Leprechaun Waste Rock Pile	65.95	103.56	53.19	218.55
South of Marathon Waste Rock Pile (East)	306.70	313.38	285.48	358.70
Southeast of TMF (Deep)	264.93	270.72	255.45	286.42
Southeast of TMF (Shallow)	293.39	271.84	137.09	323.85
Southwest of Marathon Pit	190.33	191.00	157.89	296.40

Specific conductivity is a common indicator of the concentration of dissolved ions in water, such as salts, acids, and bases. An increase in specific conductivity could indicate the mobilization of metals or other dissolved solids from mining activities into the groundwater system. Monitoring conductivity, especially through real-time data collection, enables quick detection of these changes, allowing for timely investigation and early mitigation to protect surrounding ecosystems and water resources.

Groundwater specific conductivity remained generally stable across the monitoring network. Variability was reflective of changes in groundwater chemistry, water level fluctuations, or purging the well to collect grab samples. There was no consistent seasonal pattern observed. Median conductivity values ranged from approximately 63 µS/cm at Northwest of Leprechaun Pit MW to over 300 µS/cm at South of Marathon Waste Rock Pile (East) MW, indicating varying levels of dissolved ions across the site.

Northwest of Leprechaun Pit and South of Leprechaun Waste Rock Pile showed the greatest variability, with large ranges and frequent short-term fluctuations in the graphs. This may be attributed to their proximity to mine activities around Leprechaun Pit. Shallow wells, such as Southeast of TMF (shallow), also exhibited noticeable variability, consistent with influence from recharge and changing geochemical conditions. In contrast, deeper wells, including Southeast of TMF (deep) and Berry Pit (deep), showed relatively narrow ranges and stable trends, indicating more consistent groundwater chemistry and limited external influence.

Groundwater - Specific Conductivity Station Graphs



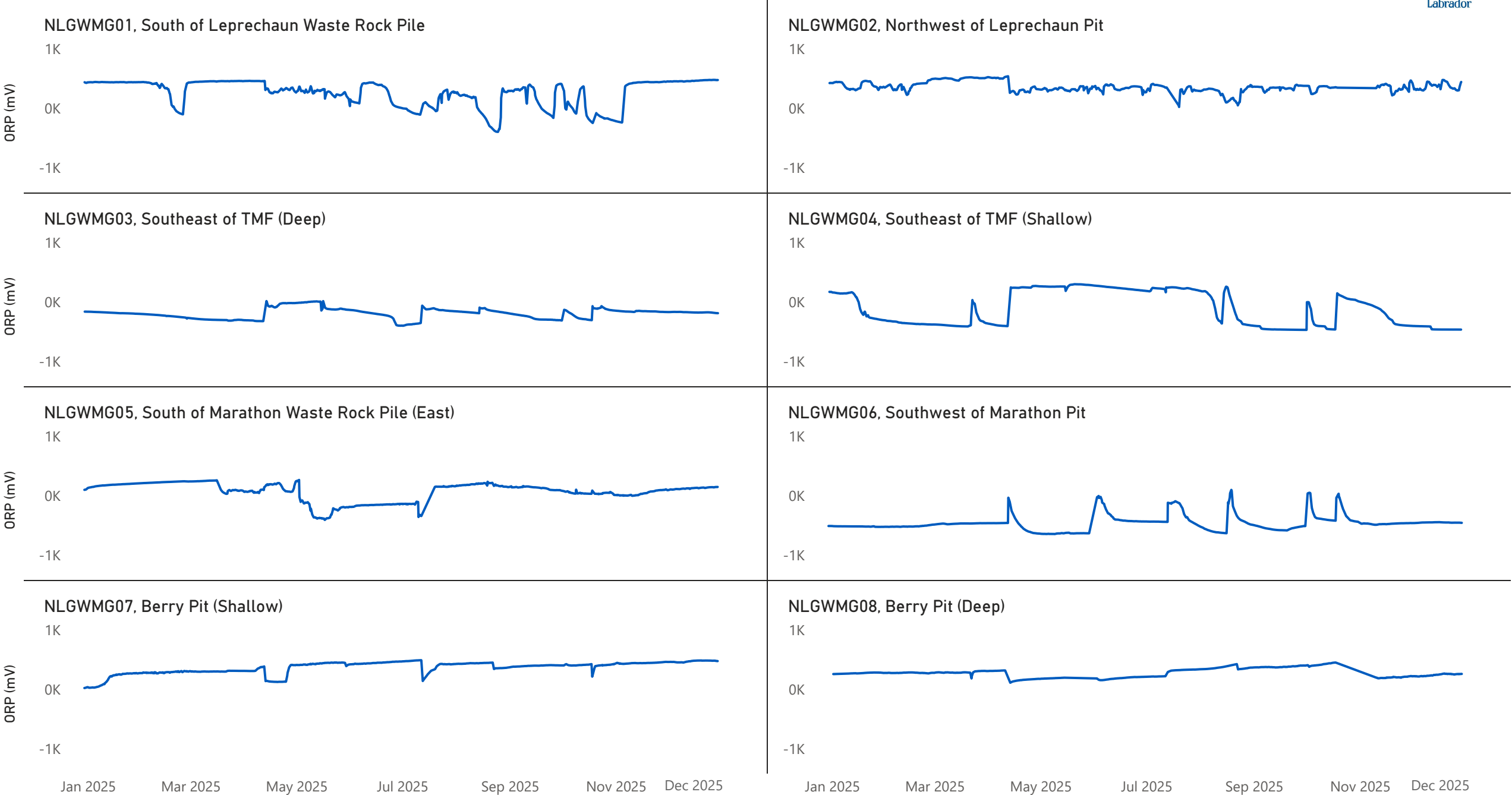
Groundwater - Oxidation-Reduction Potential (ORP)

Annual ORP Statistics (mV)				
Station Name ▲	Median	Average	Minimum	Maximum
Berry Pit (Deep)	275.70	278.06	104.10	449.90
Berry Pit (Shallow)	405.20	366.36	20.20	488.60
Northwest of Leprechaun Pit	347.70	356.76	19.30	537.20
South of Leprechaun Waste Rock Pile	328.35	254.53	-400.40	476.30
South of Marathon Waste Rock Pile (East)	108.94	67.26	-412.63	262.81
Southeast of TMF (Deep)	-179.30	-194.29	-404.10	36.90
Southeast of TMF (Shallow)	-211.10	-115.40	-471.90	323.80
Southwest of Marathon Pit	-473.41	-464.07	-664.16	97.69

Oxidation-reduction potential (ORP) measures how readily a solution can gain (reduction) or lose (oxidation) electrons. In groundwater systems, ORP is directly linked to the mobility of potential contaminants, as redox conditions control the chemical form, solubility, and behavior of many chemical constituents, including metals. Tracking ORP trends provides valuable insight into shifts in groundwater chemistry and helps detect early signs of environmental changes.

ORP trends across the groundwater monitoring wells show notable variability between locations. Shallow wells, especially Southeast of TMF (shallow) and Southwest of Marathon Pit, showed the most noticeable swings, including sharp spikes and dips, suggesting they are more influenced by recharge and changing conditions. In contrast, deeper wells like Southeast of TMF (deep) and Berry Pit (deep) were more stable, indicating more consistent groundwater conditions. Wells near mining activities, such as South of Leprechaun Waste Rock Pile and Northwest of Leprechaun Pit, exhibited slightly more variability, likely reflecting localized mixing and site-related influences. Often ORP shifts can also be related to purging the well which disturbs the water column, and introduces fresh water into the well. ORP can takes days to weeks for values to stabilize.

Groundwater - ORP Station Graphs



Groundwater - Water Level



Annual Water Level Statistics (m)					
Station Name	Minimum	Maximum	Range	Average	Median
Berry Pit (Deep)	15.00	17.29	2.29	17.06	17.17
Berry Pit (Shallow)	1.06	3.09	2.03	2.15	2.32
Northwest of Leprechaun Pit	19.93	22.31	2.37	21.67	21.95
South of Leprechaun Waste Rock Pile	5.37	7.22	1.84	6.38	6.44
South of Marathon Waste Rock Pile (East)	12.90	13.91	1.01	13.43	13.42
Southeast of TMF (Deep)	14.95	16.83	1.88	16.16	16.17
Southeast of TMF (Shallow)	3.54	5.57	2.03	4.74	4.85
Southwest of Marathon Pit	5.70	6.83	1.13	6.43	6.48

Monitoring groundwater elevation, or water level, in wells at a gold mine site is crucial for protecting the environment and managing water resources effectively. Fluctuations in groundwater levels can reveal changes in natural flow patterns caused by mining activities such as pit dewatering, blasting, or waste rock placement, which may affect surrounding ecosystems and surface water bodies. The values in the table above reflect the water level relative to the instrument depth sensor positioned at a known depth in each well.

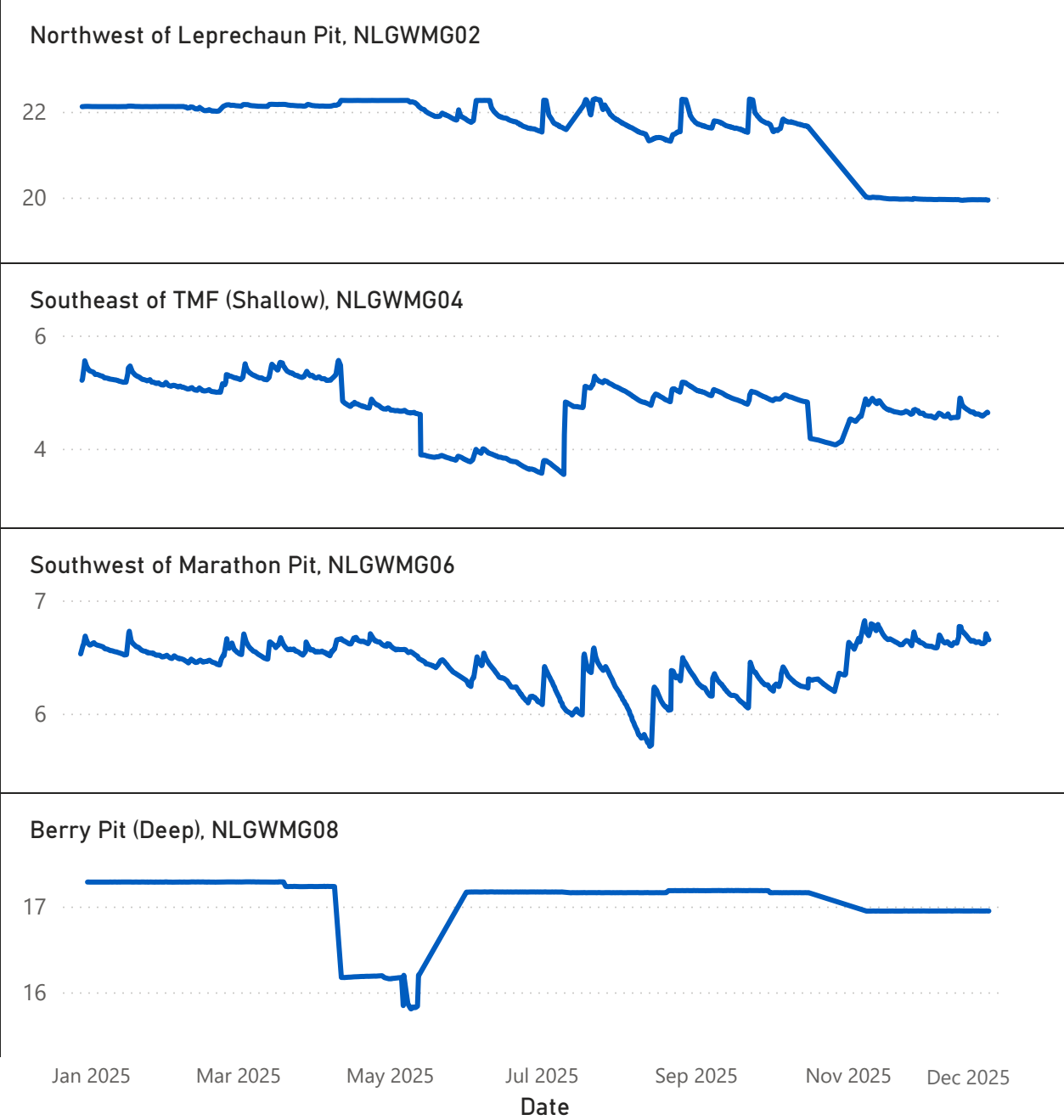
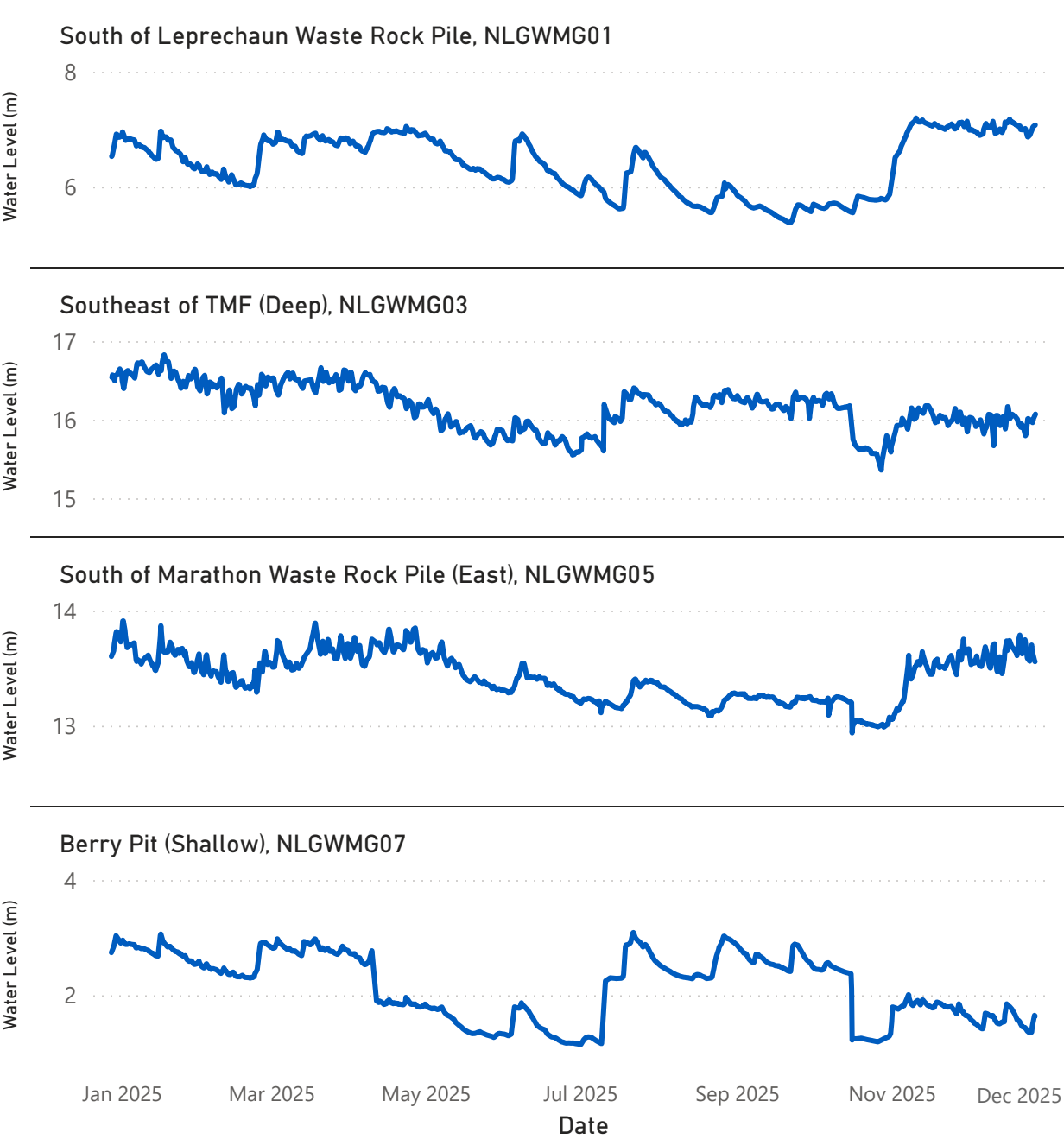
Throughout 2025, groundwater levels across the site reflected minor, frequent fluctuations. A slight decline occurred during the summer months, with the lowest levels recorded in late September to early October. This drop is likely the result of an unusually hot and dry summer, which reduced groundwater recharge from precipitation and contributed to regional declines in aquifer levels. In contrast, higher water levels were observed in the spring and fall, driven by increased recharge from rainfall and seasonal cycles.

Abrupt shifts in groundwater elevation coinciding with instrument changeouts may be attributable to purging the well to collect samples or calibration differences between depth sensors on the instruments and may not necessarily represent actual changes in groundwater levels. An abrupt drop can be observed at Berry Pit (deep) on April 15 which coincides with grab sample collection and instrument switch-out . The drop could be a result of purging the well, or it could be a difference in the depth sensor calibration given the lack of water level increase/recharge after purging the well and switching the instrument.

Groundwater Elevation Station Graphs



Water Elevation (m)



2025 Conclusions and Path Forward

Conclusions

- In 2025, water quality instruments were successfully deployed at all groundwater monitoring stations for the full calendar year, and at surface water stations from April through December.
- The RTWQ monitoring network remained unchanged and consisted of 14 stations, including 6 surface water stations and 8 groundwater monitoring wells.
- Groundwater monitoring was successful across all stations, with no major interruptions in data transmission. The data remained relatively stable and consistent across all parameters, with minor fluctuations attributed to routine well purging and seasonal hydrological variations.
- Monitoring at paired shallow and deep groundwater wells continued to demonstrate the value of this approach for assessing groundwater conditions. Deep wells generally exhibited stable water quality characteristics, while shallow wells showed greater variability and responsiveness to surface influences, supporting early identification of potential changes in groundwater quality.
- Surface water temperature exhibited expected seasonal patterns, increasing during spring and summer and decreasing through the fall. pH generally remained within applicable CCME guidelines for the protection of aquatic life throughout the monitoring period, with a few exceptions. Turbidity levels were generally low across the monitoring network, indicating good water clarity, while short-term variations in water quality parameters were typically associated with precipitation events, seasonal runoff, and changes in water level.
- QAQC assessments demonstrated strong overall instrument performance, with the majority of groundwater and surface water measurements receiving good or excellent rankings. Lower rankings were generally associated with dissolved oxygen sensor drift, instrument equilibration time, sampling location differences, and well-specific conditions rather than widespread equipment issues.
- The RTWQ network operated reliably throughout the year with only minor data gaps. Frozen Ears Lake Outlet experienced a temporary loss of water level data due to transmission interruptions. At Valentine River Outlet, a period of low water levels exposed the sonde and resulted in erroneous measurements that were subsequently removed from the dataset.

Path Forward

- The Water Resources Management Division (WRMD), in collaboration with Equinox Gold, will continue to operate and maintain the Real-Time Water Quality (RTWQ) network at the Valentine Gold Project. Routine instrument calibrations and regular maintenance will be conducted to ensure reliable operation and effective environmental monitoring. Site visits will occur every 4–6 weeks for surface water stations and every 10–12 weeks for groundwater stations.
- Opportunities to further improve groundwater QAQC procedures will continue to be evaluated, particularly with respect to well purging effects, grab sample collection methods, and sensor stabilization periods. New groundwater QAQC measures will be tested and implemented during the upcoming monitoring season. These measures will include on-site calibration checks of water level and depth sensors, along with verification of instrument measurements through manual water level calculations and field observations to confirm sensor accuracy and identify potential drift. In addition, passive groundwater sampling techniques will be evaluated as a potential alternative to traditional grab sampling methods, with the goal of improving QAQC comparisons during deployment and removal events.
- WRMD extends its appreciation to the Environmental Team at Equinox Gold – Valentine Gold Mine for their continued collaboration and support in maintaining the RTWQ network and ensuring the success of this monitoring program.
- Installation of a new monitoring well, "South of MGO Stockpile" (NLGWMG09), in summer 2026.

2025 Precipitation Data

Retrieved from the Valentine Gold Mine MET Station



1.03K

Total Annual (mm)

0.00

Average (mm/hr)

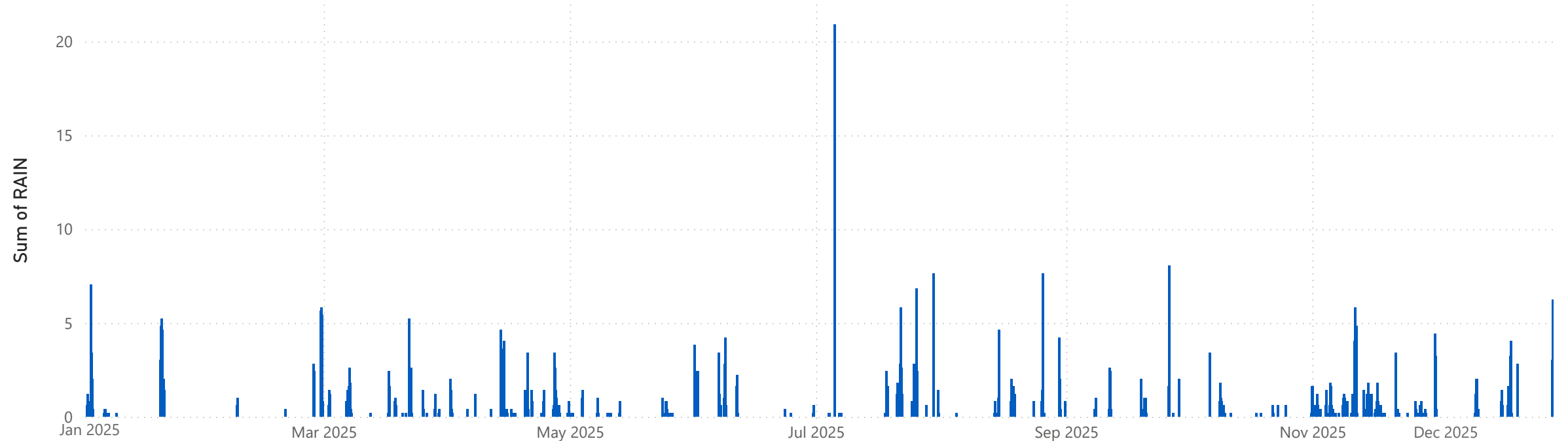
0.00

Minimum (mm/hr)

20.90

Maximum (mm/hr)

Precipitation (mm)



2025 Air Temperature Data

Retrieved from the Valentine Gold Mine MET Station



4.51

Average (°C)

3.39

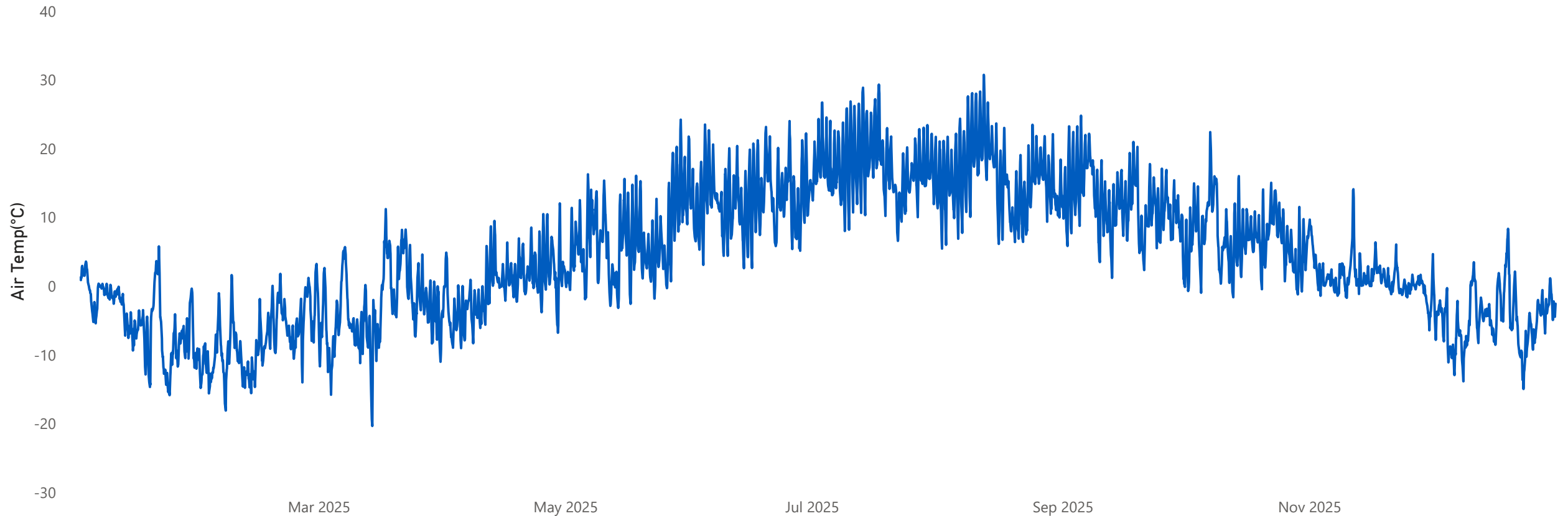
Median (°C)

-20.34

Minimum (°C)

30.74

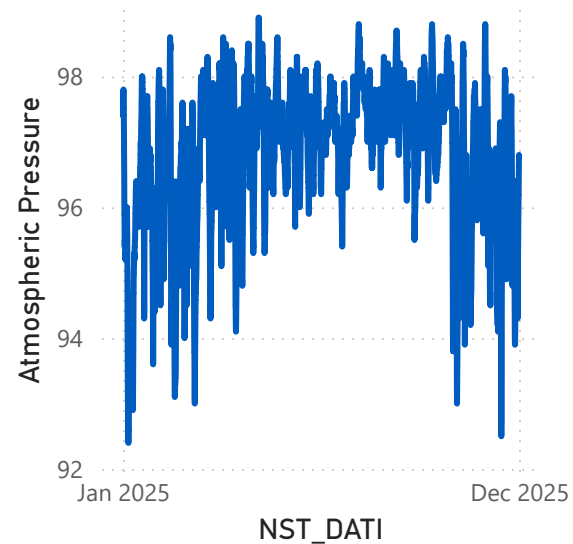
Maximum (°C)



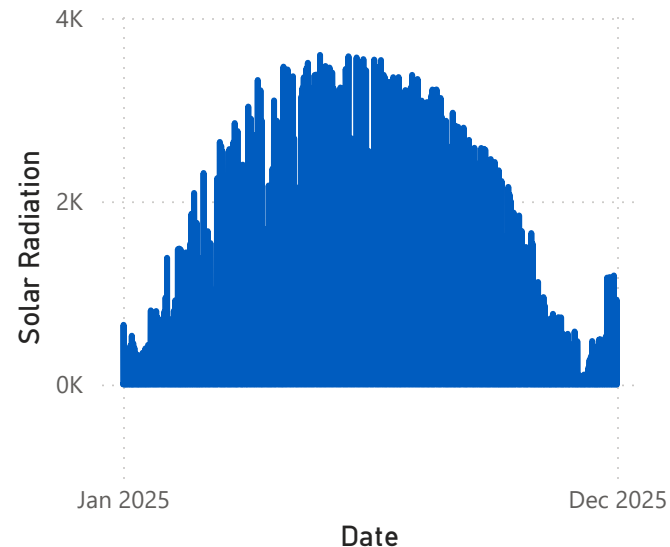
2025 Additional MET Data

Retrieved from the Valentine Gold Mine MET Station

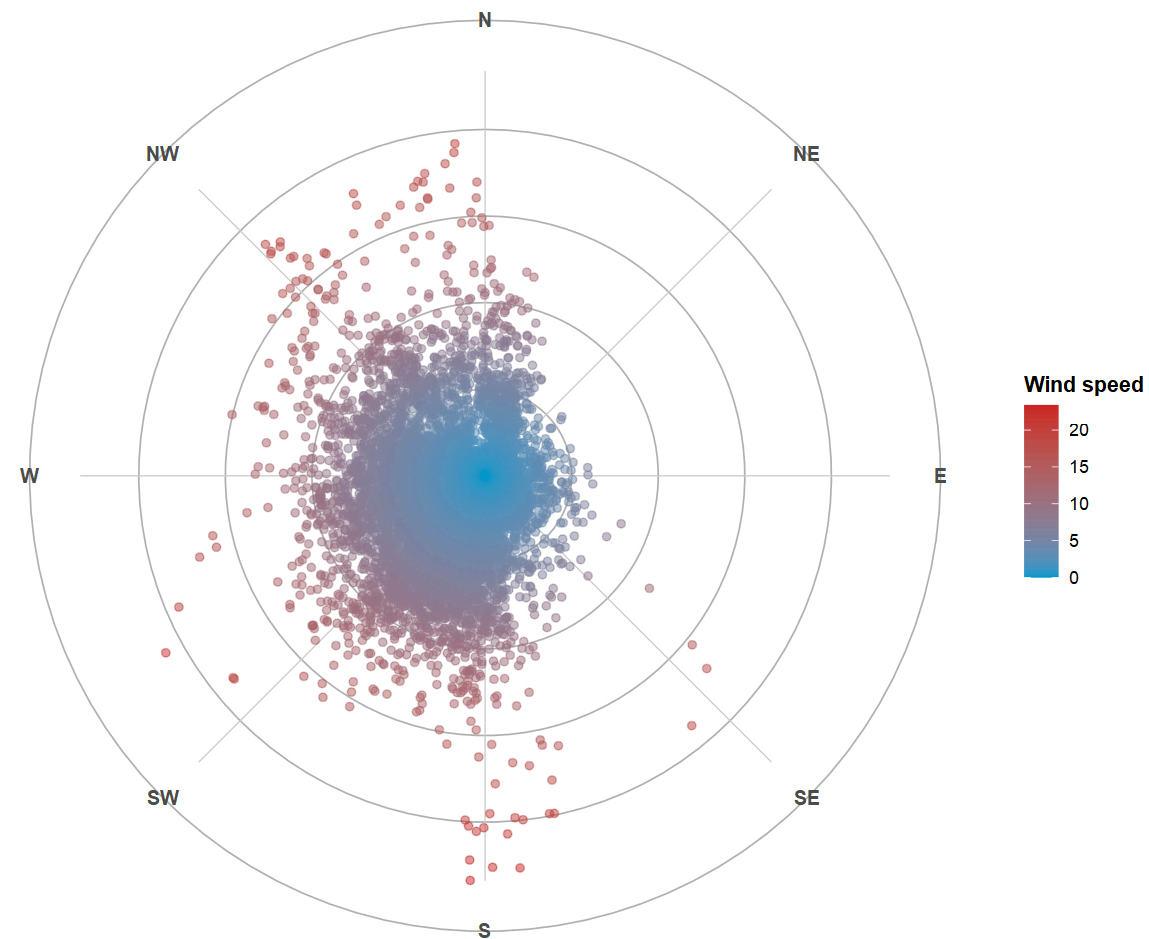
Atmospheric Pressure



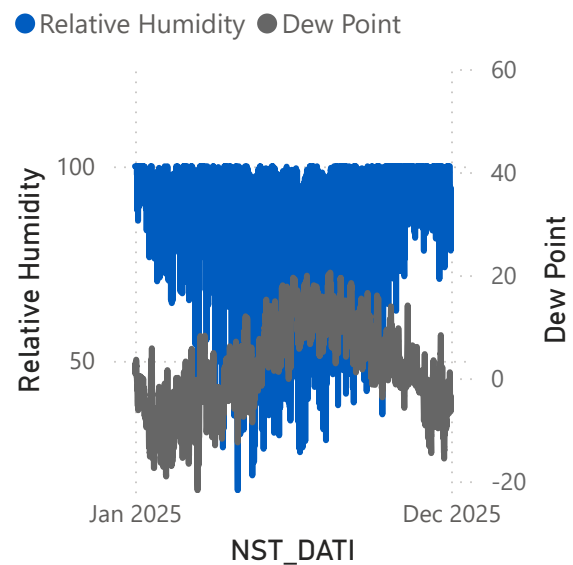
Solar Radiation



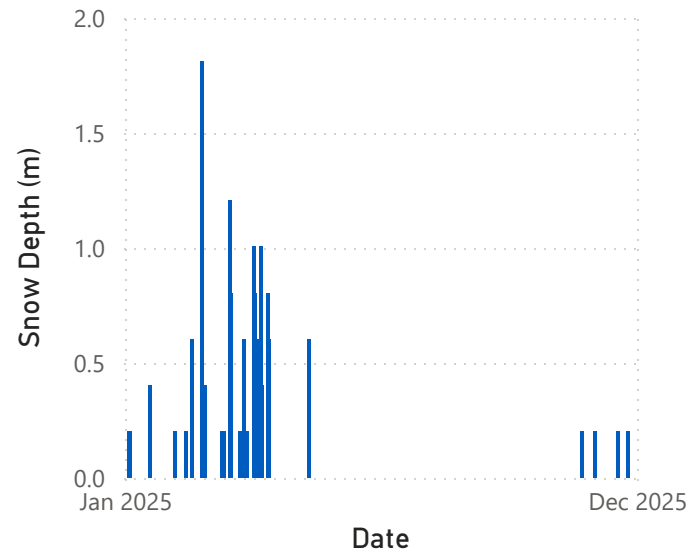
Wind Speed (m/s) and Wind Direction



Relative Humidity and Dew Point



Snow Depth (m)



Appendix I

Site Descriptions

Victoria River Outlet Station

NF02YN0047

Station Location

Victoria River, 6.3 km downstream of Victoria Dam and situated below the quarry pit. The monitoring station is positioned on the western shoreline, accessible via an ATV trail leading down from the quarry. A large embankment lies adjacent to the station. The riverbed substrate consists mainly of soft mud and decaying organic matter. The sonde is deployed at an approximate depth of 0.75 meters, typically 3 to 5 meters from the shoreline



Valentine River Outlet Station

NF02YN0048

Station Location

Valentine River, 1.9 km downstream of the Valentine Lake outlet. The monitoring station is situated approximately 15 meters upstream of the access road crossing bridge, on the southern shoreline. The riverbed consists of bedrock, boulders, and gravel. The sonde is deployed at a depth of 0.10 to 0.25 meters, typically 1 to 5 meters from the shore.



Roebucks Brook Station

NF02YN0049

Station Location

Roebucks Brook, 1.6 km downstream of the Roebucks Lake outlet, with the monitoring station positioned 30 meters downstream of the access road bridge crossing on the western shoreline. The riverbed substrate is composed of boulders, pebbles, and gravel. The sonde is deployed at an approximate depth of 0.25 to 0.50 meters, typically 1 to 2 meters from the shoreline.



Victoria River Tributary

NF02YN0050

Station Location

Victoria River Tributary, located approximately 0.60 km downstream of an unnamed pond and about 0.90 km upstream of the Victoria River. The monitoring station is positioned roughly 10 meters upstream of the access road bridge crossing, on the northern shoreline. The sonde is deployed at a depth of approximately 0.10 to 0.30 meters, around 0.5-1 meter from the shoreline.



Victoria River at Beothuk Lake

NF02YN0051

Station Location

Station is located approximately 55 kilometers from Calibre Mining's Valentine Gold Mine, at the outlet of Victoria River into Beothuk Lake. It is situated on the eastern side of the river, roughly 20 to 30 meters downstream of a bridge along the access road. The riverbed at this location is primarily composed of bedrock and large boulders. The sonde is typically deployed at a depth of 0.5 to 1.0 meters, approximately 3 to 5 meters from the shoreline.



Frozen Ears Lake Outlet

NF02YN0052

Station Location

Located at the beginning of the outlet of Frozen Ear Lake into Valentine Lake. The monitoring station is positioned on the southern edge. The riverbed substrate is primarily composed of boulders, soft mud, and silt. The sonde is deployed at an approximate depth of 0.5 meters, typically 5 to 8 meters from the shoreline.



South of Leprechaun Waste Rock Pile Monitoring Well

NLGWMG01

Station

Monitoring well located approximately 1.2 km southeast of the Leprechaun Pit, directly south of the Leprechaun waste rock pile. The well is 9 meters deep and is primarily designed to monitor shallow seepage, while also capturing potential seepage from fractured bedrock.



Northwest of Leprechaun Pit Monitoring Well

NLGWMG02

Station

Monitoring well located approximately 0.60 km north of Leprechaun Pit. This 50-meter-deep well is primarily intended to monitor groundwater drawdown adjacent to the pit resulting from dewatering activities.



Southeast of TMF Monitoring Well - Deep and Shallow

NLGWMG03 (deep) and NLGWMG04 (shallow)

Station

Co-located monitoring wells situated approximately 0.75 km southeast of the Tailings Management Facility (TMF). The shallow well is 7.5 meters deep, and the deep well is 19 meters deep, with approximately 2.5 meters of horizontal separation. These wells are designed to monitor both shallow and deep seepage from the TMF. Having both a shallow and deep well at the same location allows for a better understanding of vertical groundwater conditions and supports early detection of potential contamination in the shallow zone.



South of Marathon Waste Rock Pile (East) Monitoring Well

NLGWMG05

Station

Located approximately 0.50 kilometers Southeast from Marathon waste rock pile. This well is 20.12m deep and is intended to monitor seepage from the waste rock pile.



Southwest of Marathon Pit Monitoring Well

NLGWMG06

Station

Located approximately 0.75 kilometers southwest from Marathon Pit. This well is 9.14 meters deep and is intended to monitor groundwater drawdown adjacent to the pit resulting from dewatering activities.



Berry Pit Monitoring Well - Deep and Shallow

NLGWMG07 (shallow) and NLGWMG08 (deep)

Station

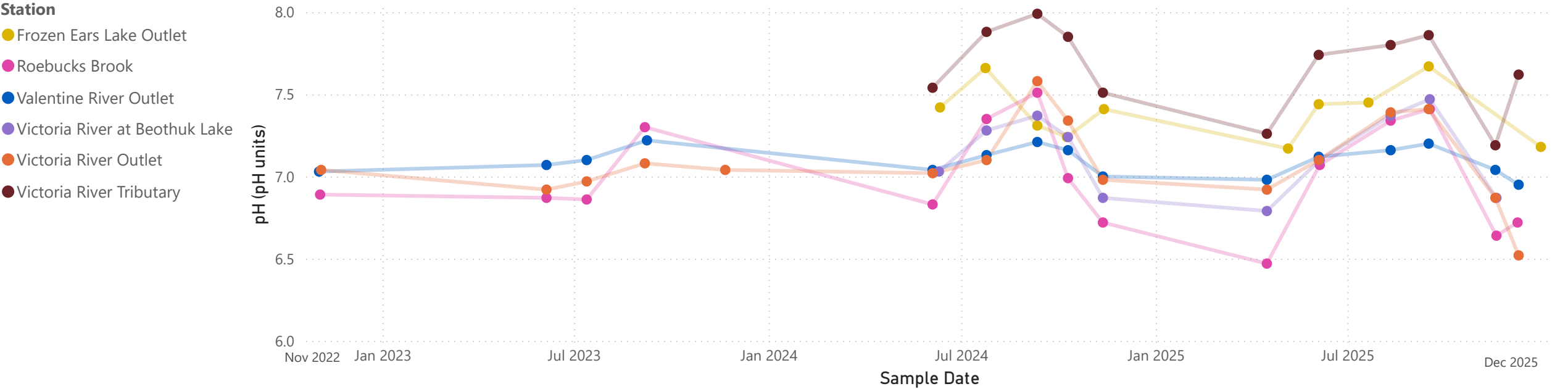
Co-located monitoring wells situated approximately 1.0 km northwest of Berry Pit. The shallow well is 6.01 meters deep, and the deep well is 17.98 meters deep, with approximately 4-5 meters of horizontal separation. These wells are designed to monitor drawdown adjacent to the pit resulting from dewatering activities, as well as potential seepage from the waste rock pile.



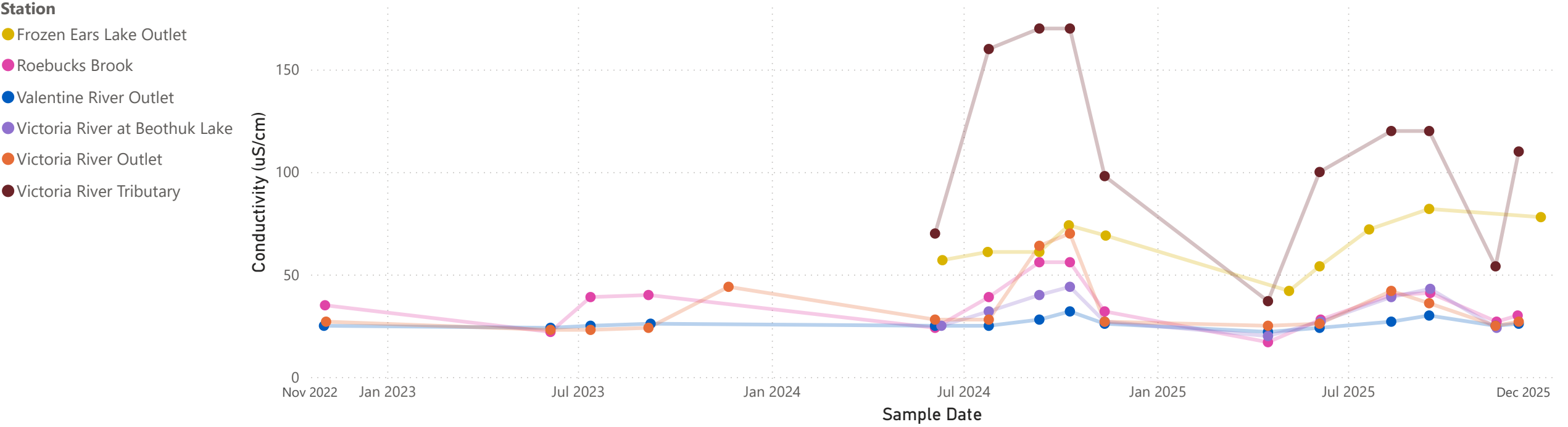
Appendix II

Surface Water Grab Sample Results

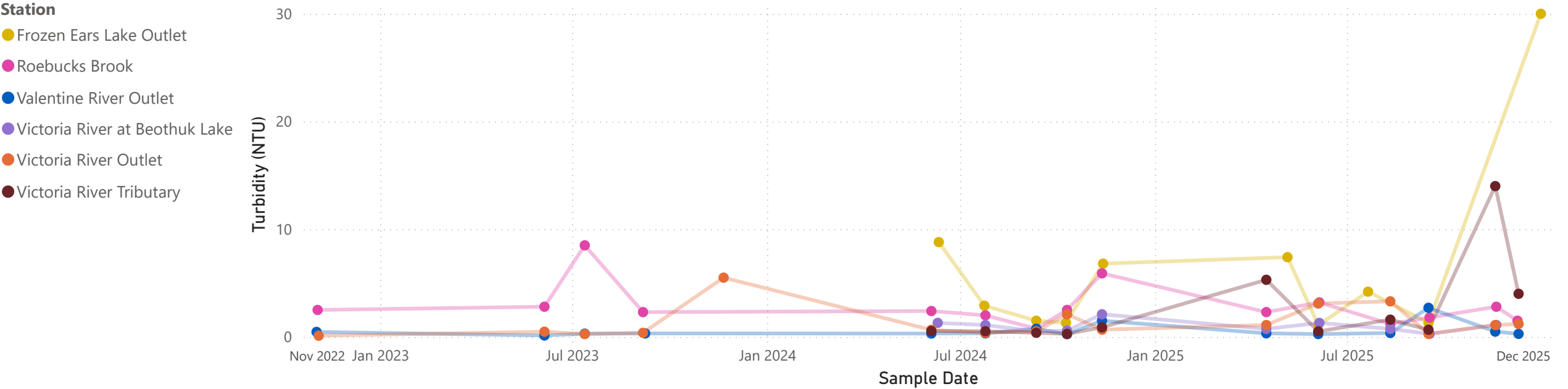
pH (pH units) by Sample Date and Station



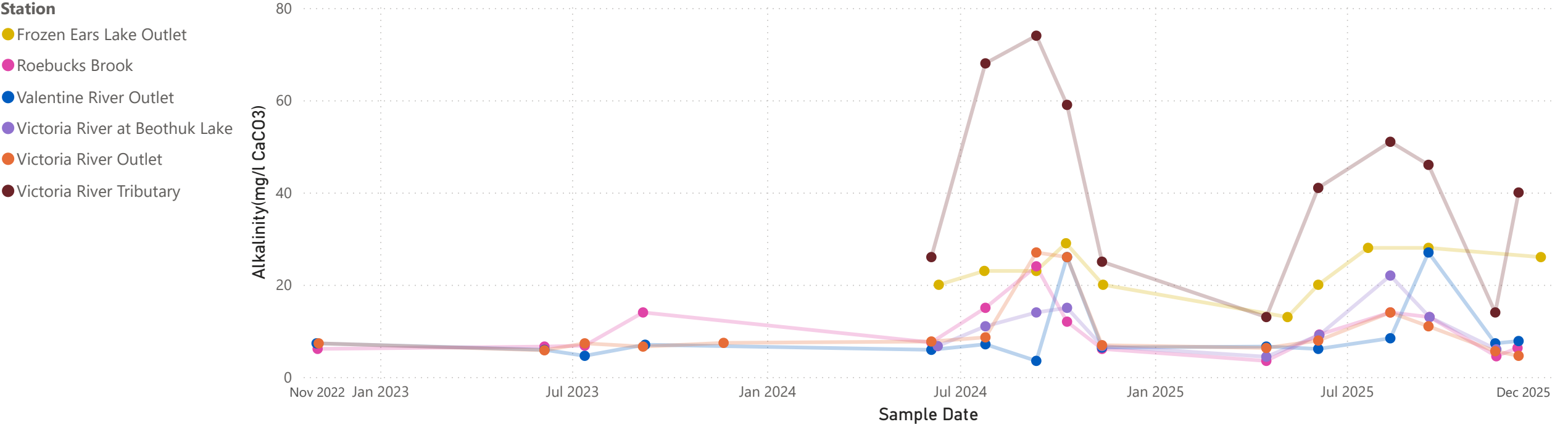
Conductivity (uS/cm) by Sample Date and Station



Turbidity (NTU) by Sample Date and Station

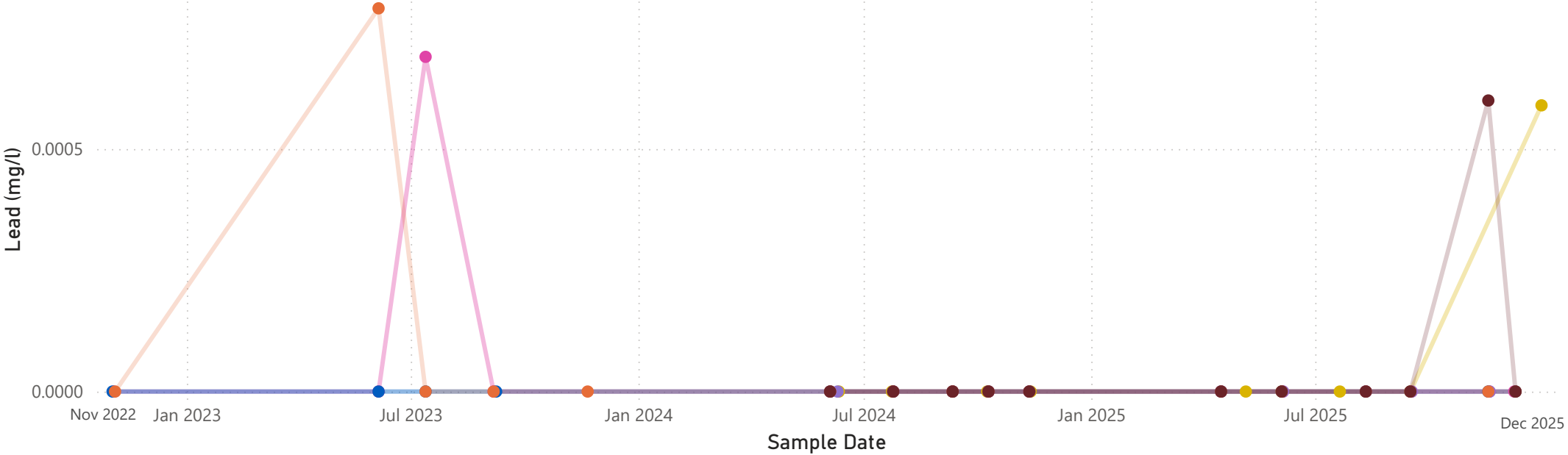


Alkalinity(mg/l CaCO3) by Sample Date and Station



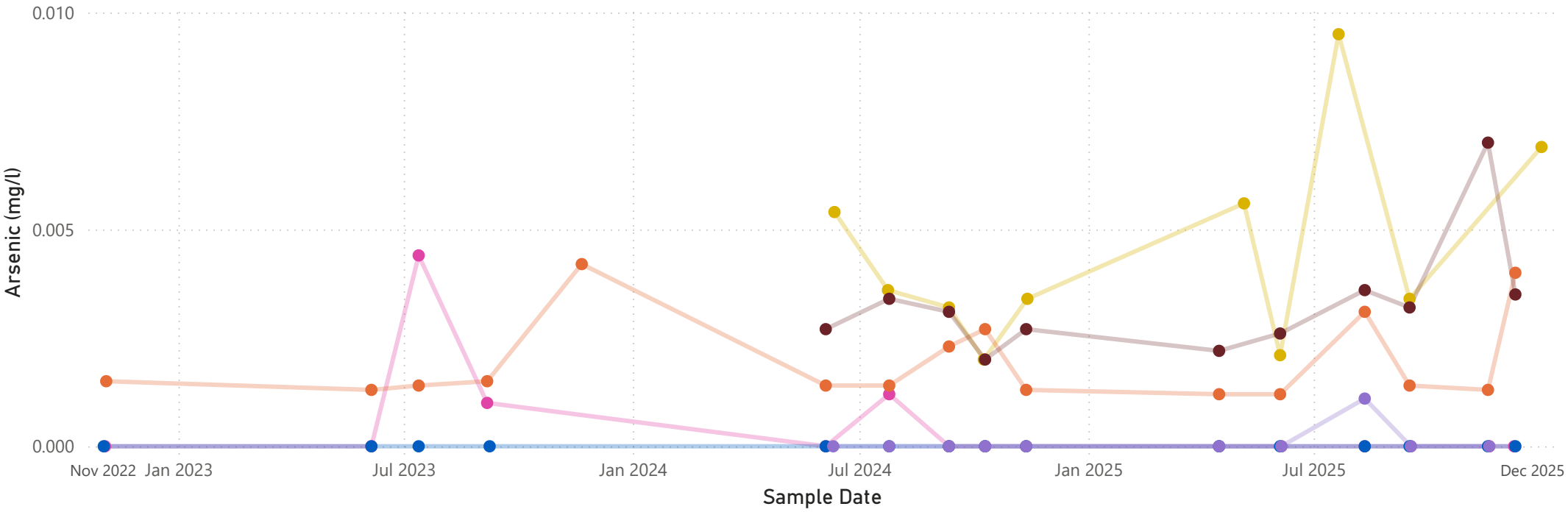
Lead (mg/l) by Sample Date and Station

- Station
- Frozen Ears Lake Outlet
 - Roebucks Brook
 - Valentine River Outlet
 - Victoria River at Beothuk Lake
 - Victoria River Outlet
 - Victoria River Tributary

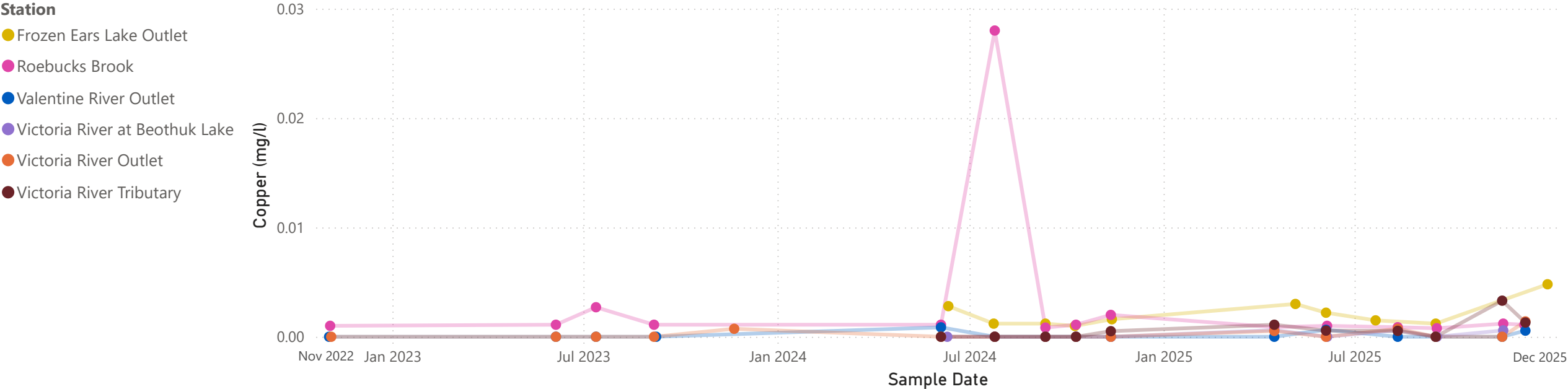


Arsenic (mg/l) by Sample Date and Station

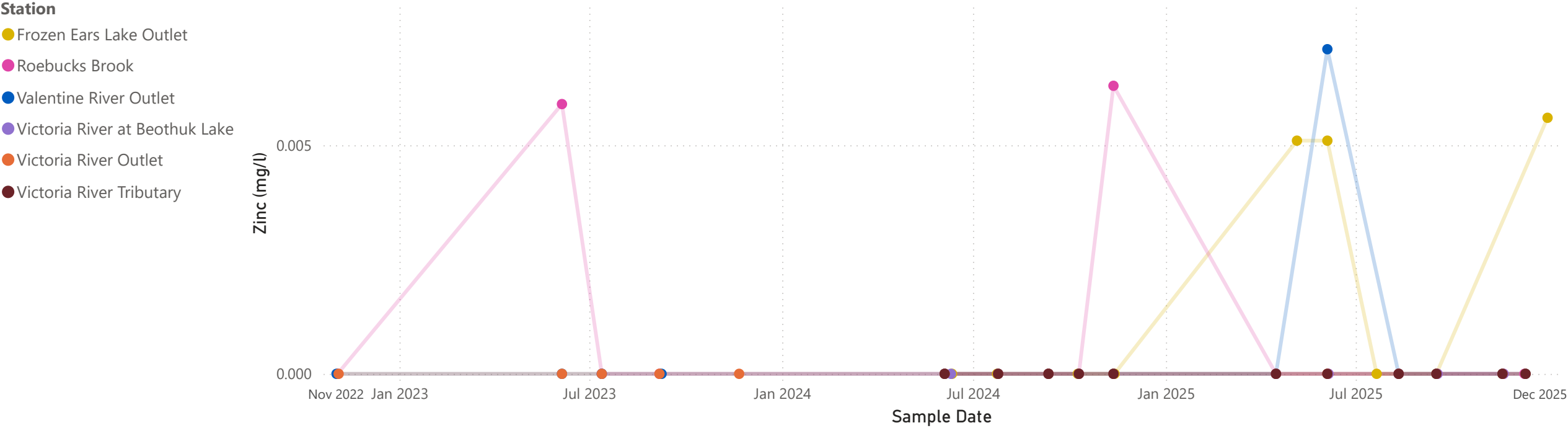
- Station
- Frozen Ears Lake Outlet
 - Roebucks Brook
 - Valentine River Outlet
 - Victoria River at Beothuk Lake
 - Victoria River Outlet
 - Victoria River Tributary



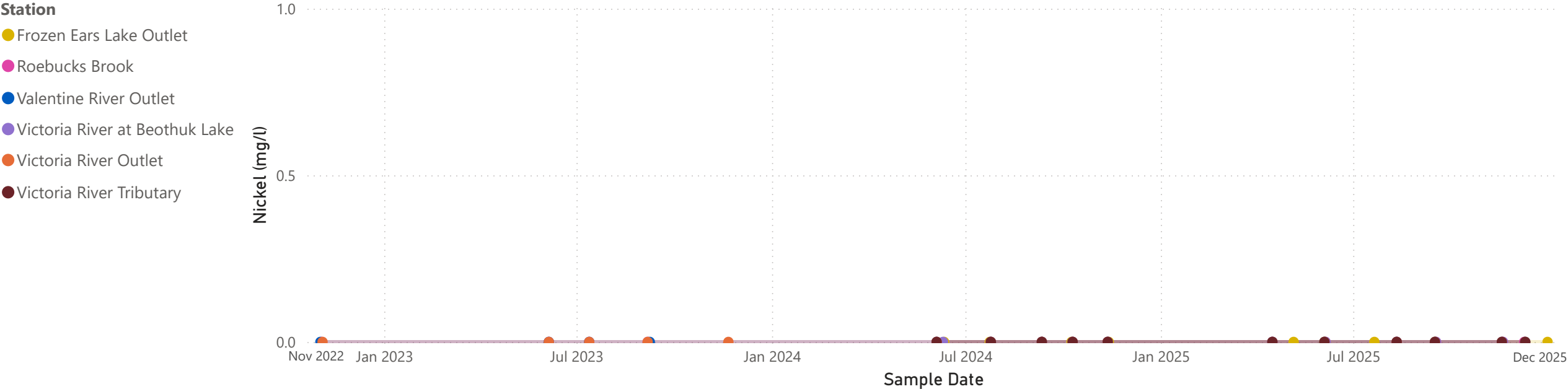
Copper (mg/l) by Sample Date and Station



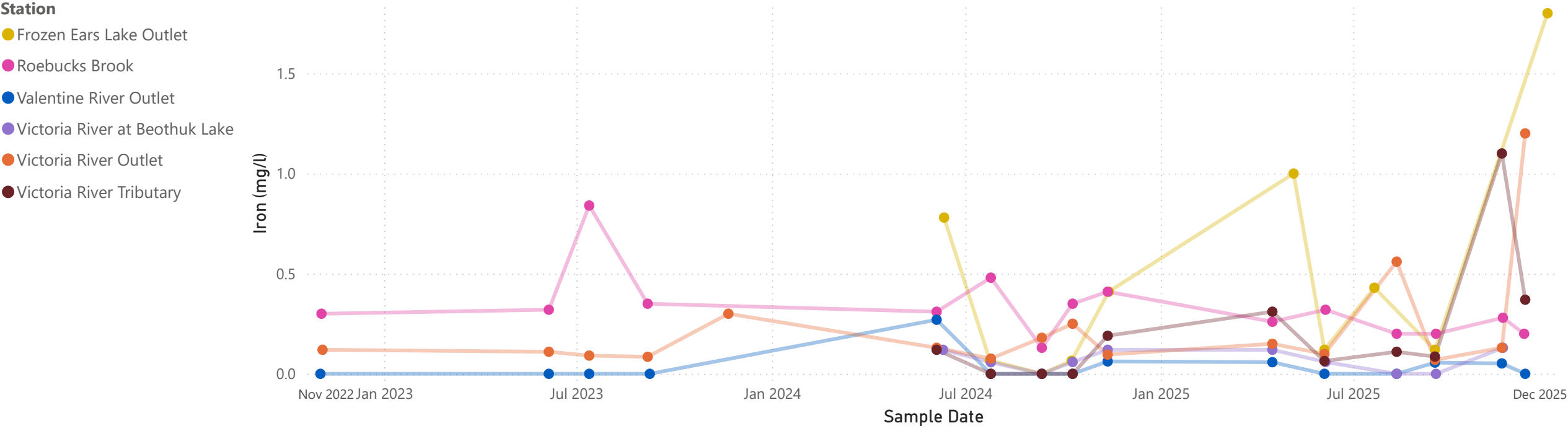
Zinc (mg/l) by Sample Date and Station



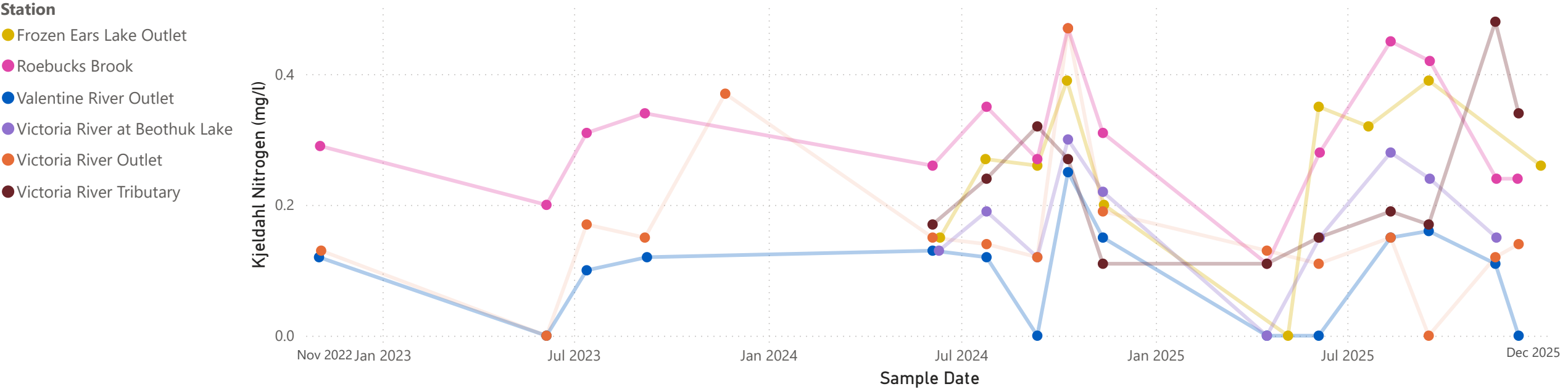
Nickel (mg/l) by Sample Date and Station



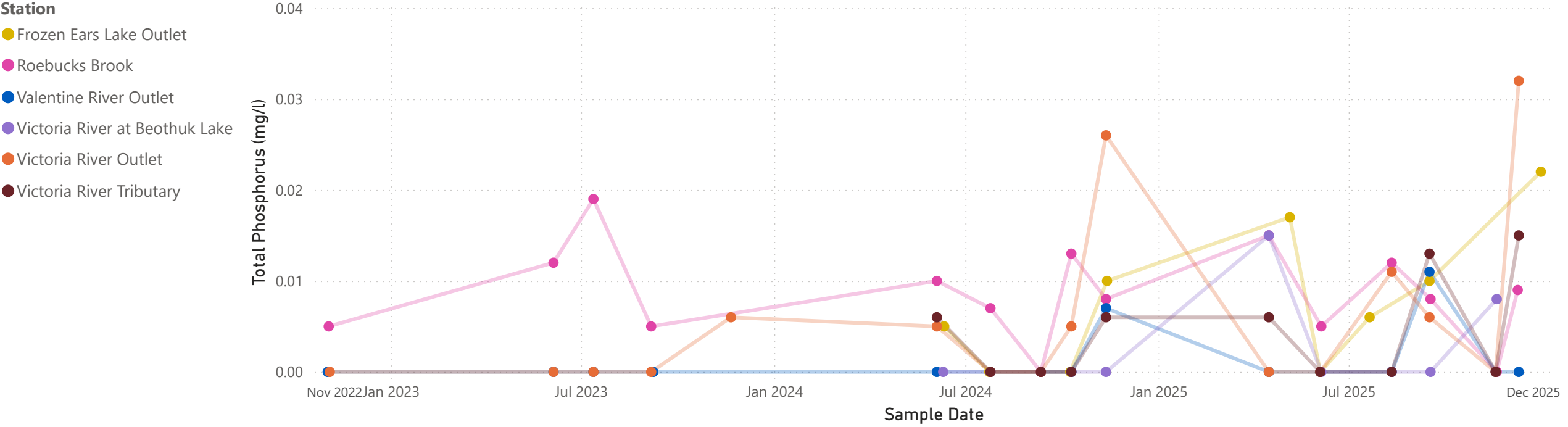
Iron (mg/l) by Sample Date and Station



Kjeldahl Nitrogen (mg/l) by Sample Date and Station



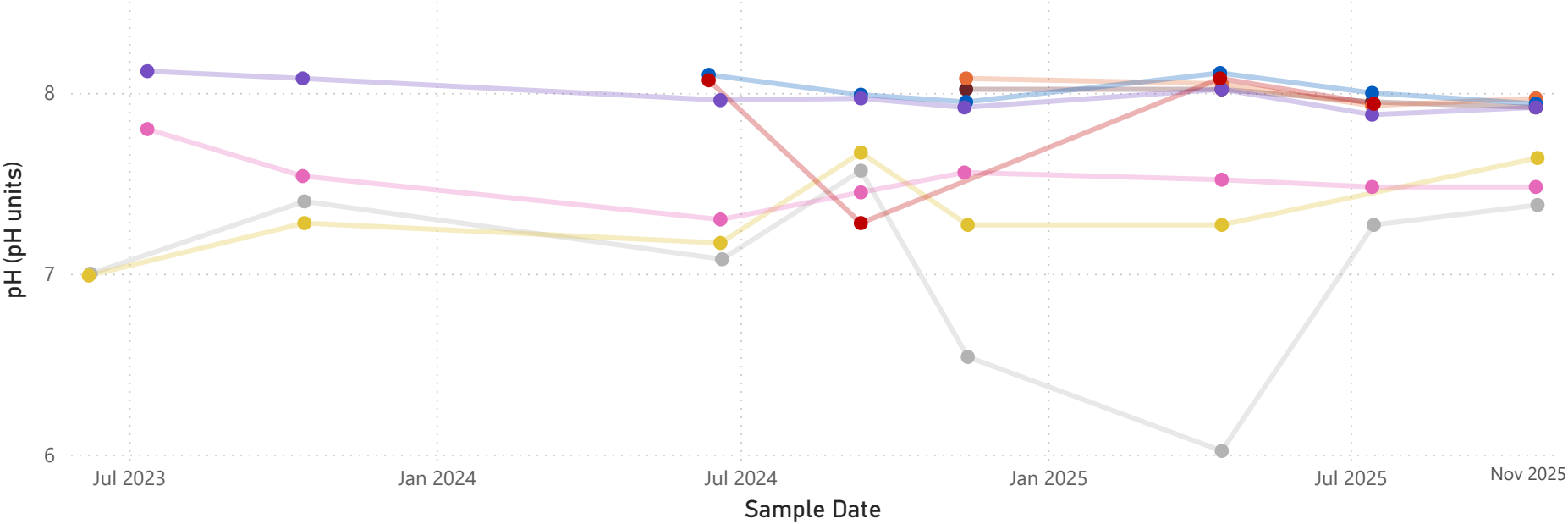
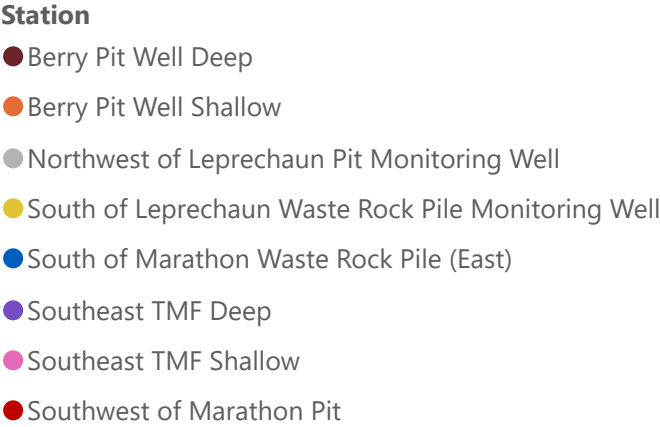
Total Phosphorus (mg/l) by Sample Date and Station



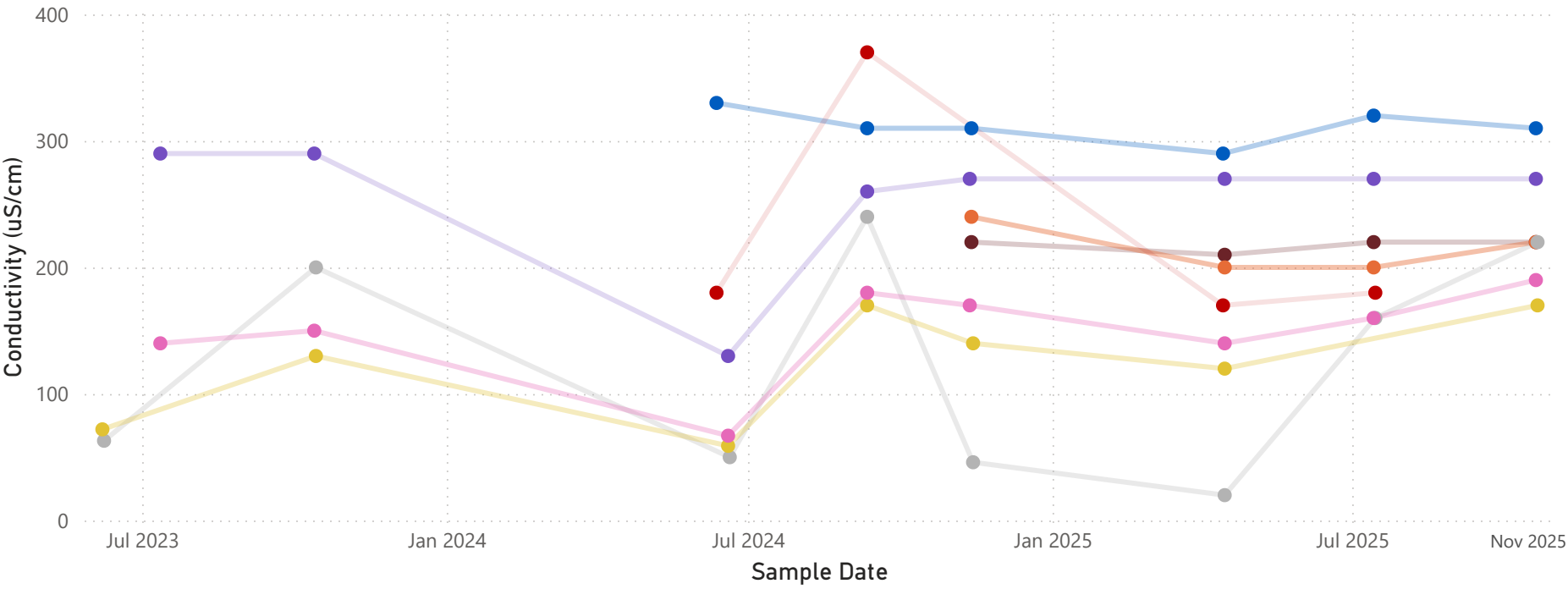
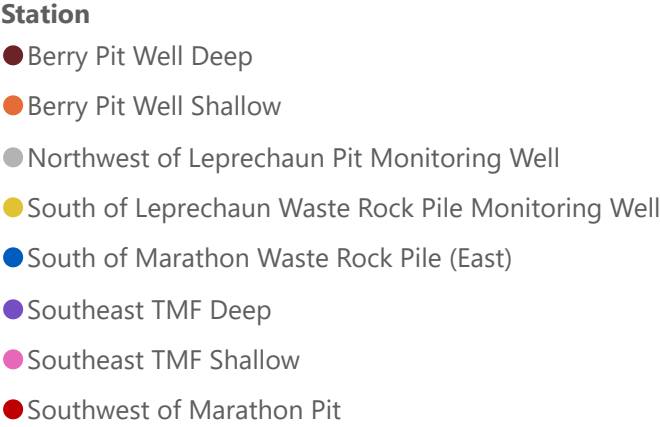
Appendix III

Groundwater Grab Sample Results

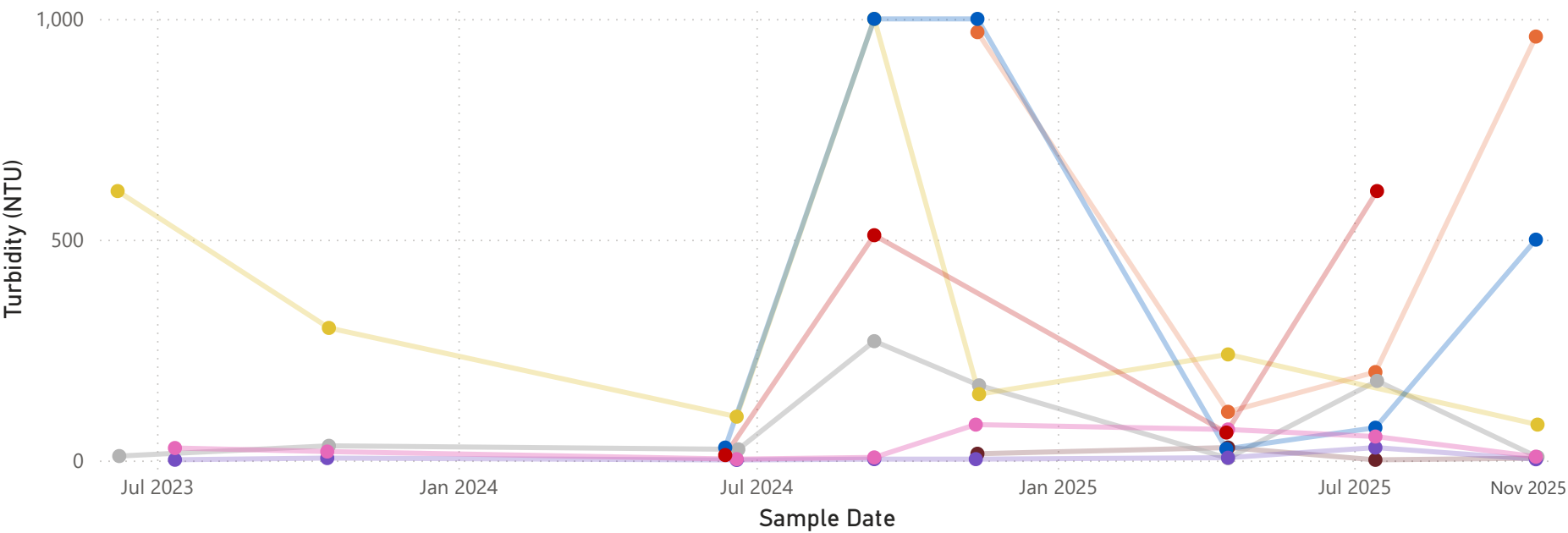
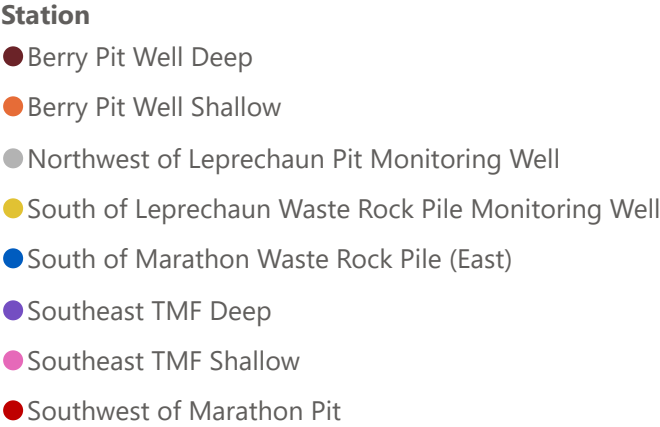
pH (pH units) by Sample Date and Station



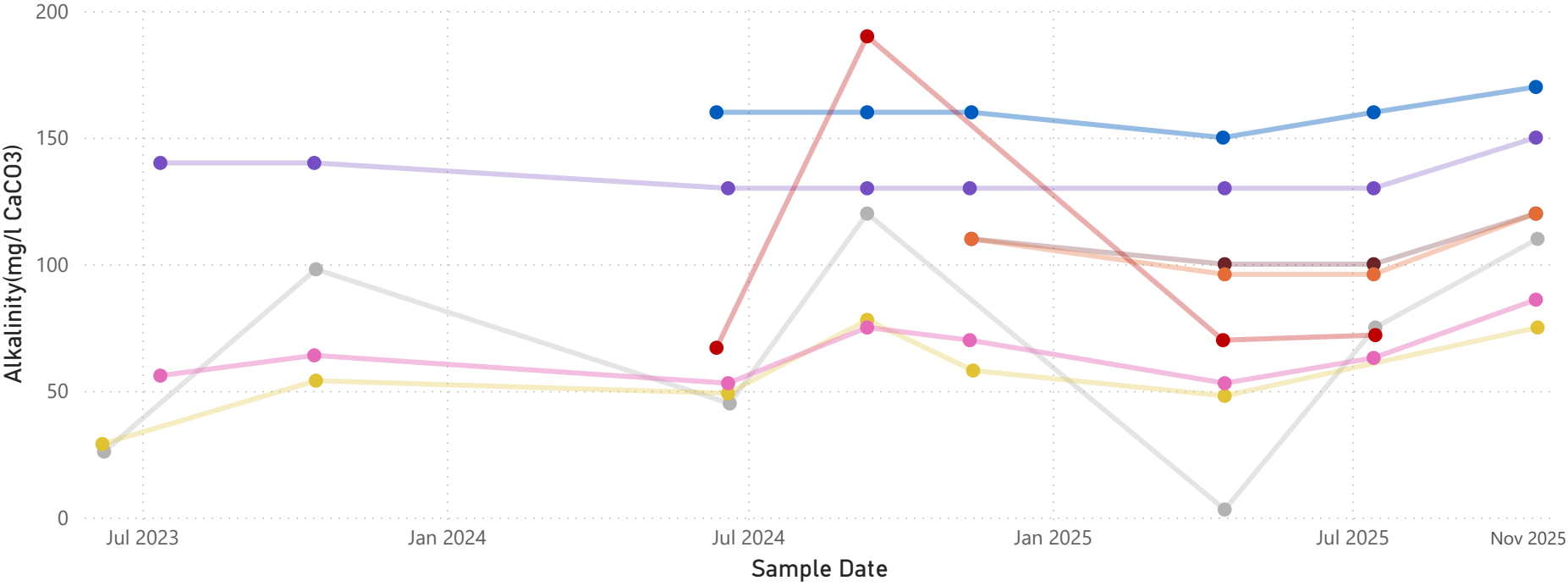
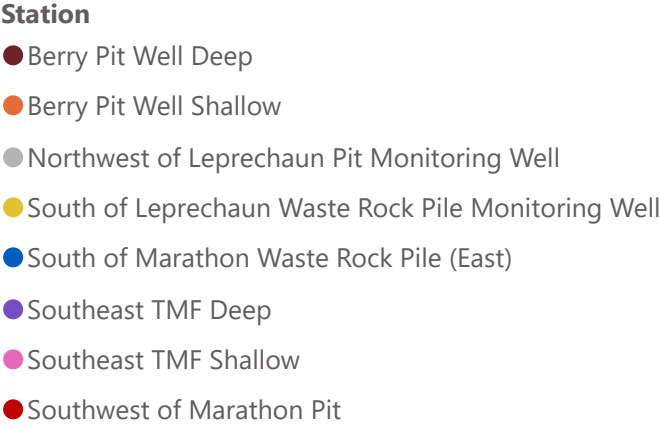
Conductivity (uS/cm) by Sample Date and Station



Turbidity (NTU) by Sample Date and Station

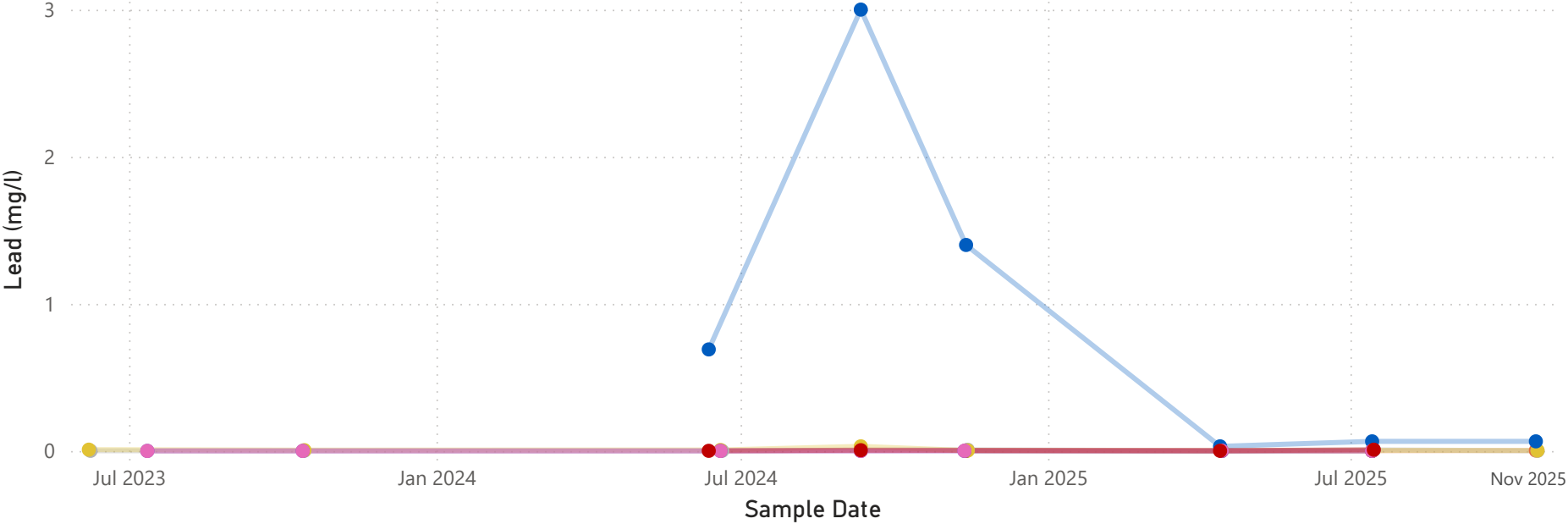


Alkalinity(mg/l CaCO3) by Sample Date and Station



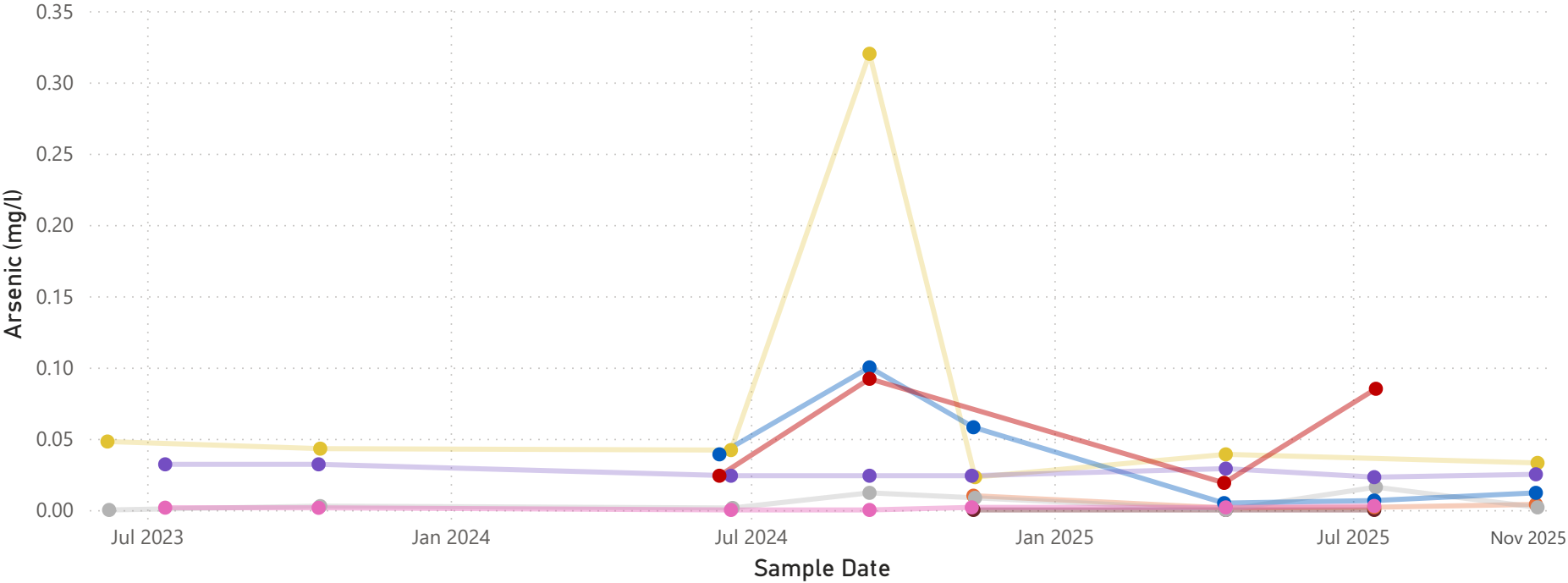
Lead (mg/l) by Sample Date and Station

- Station
- Berry Pit Well Deep
 - Berry Pit Well Shallow
 - Northwest of Leprechaun Pit Monitoring Well
 - South of Leprechaun Waste Rock Pile Monitoring Well
 - South of Marathon Waste Rock Pile (East)
 - Southeast TMF Deep
 - Southeast TMF Shallow
 - Southwest of Marathon Pit



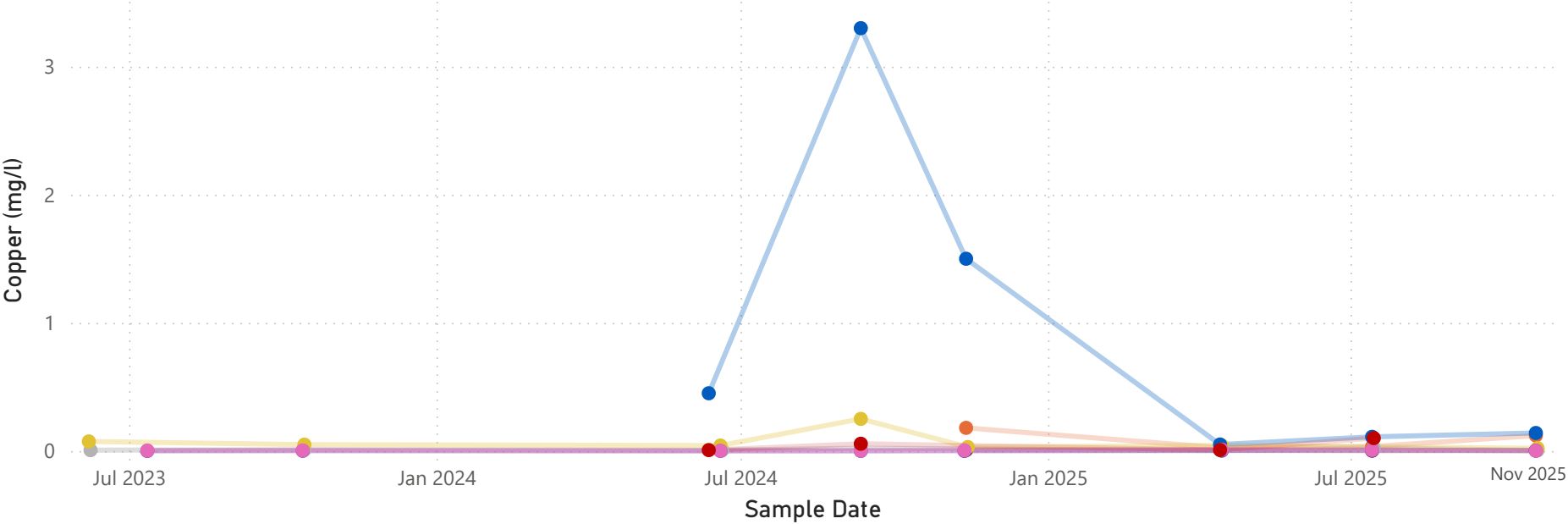
Arsenic (mg/l) by Sample Date and Station

- Station
- Berry Pit Well Deep
 - Berry Pit Well Shallow
 - Northwest of Leprechaun Pit Monitoring Well
 - South of Leprechaun Waste Rock Pile Monitoring Well
 - South of Marathon Waste Rock Pile (East)
 - Southeast TMF Deep
 - Southeast TMF Shallow
 - Southwest of Marathon Pit



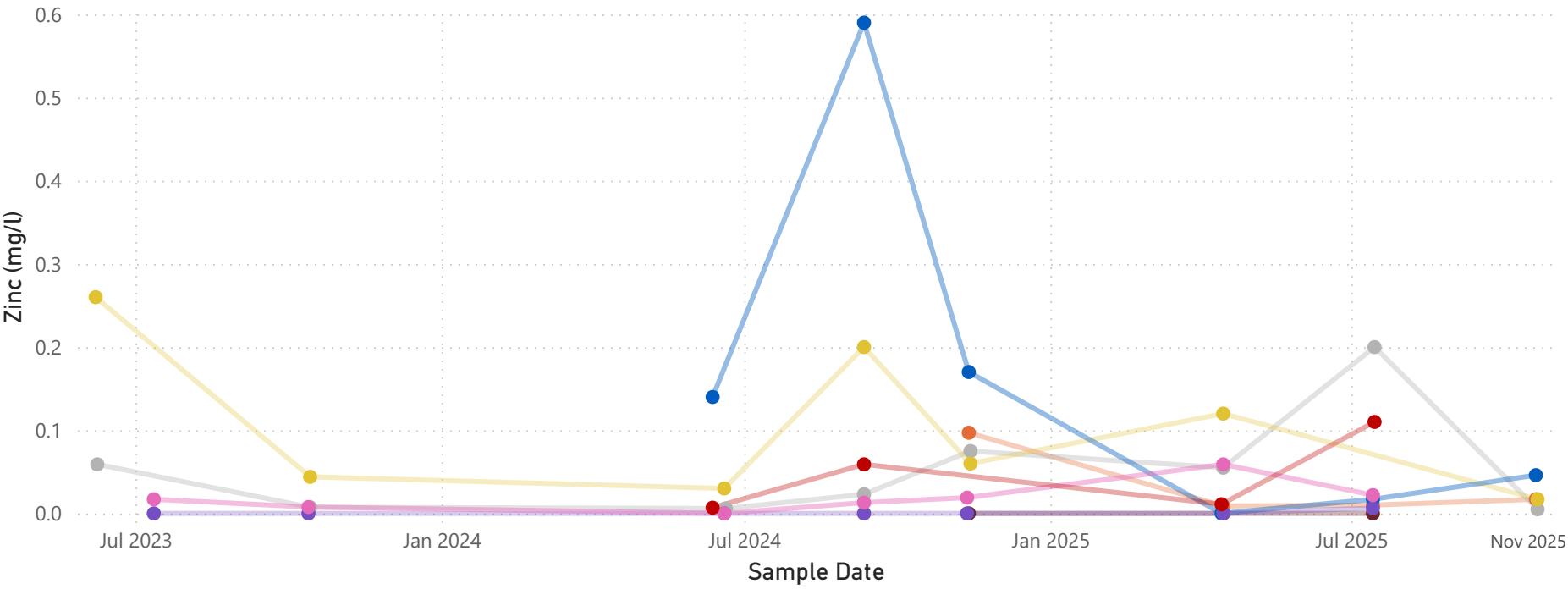
Copper (mg/l) by Sample Date and Station

- Station
- Berry Pit Well Deep
 - Berry Pit Well Shallow
 - Northwest of Leprechaun Pit Monitoring Well
 - South of Leprechaun Waste Rock Pile Monitoring Well
 - South of Marathon Waste Rock Pile (East)
 - Southeast TMF Deep
 - Southeast TMF Shallow
 - Southwest of Marathon Pit

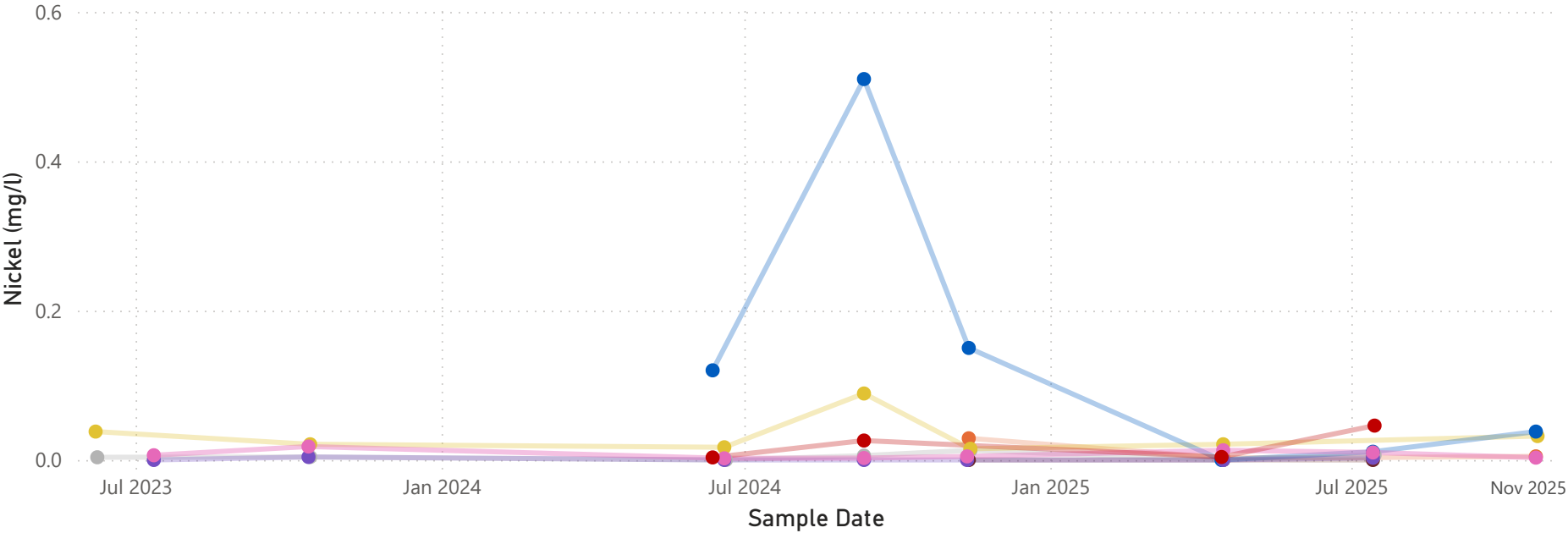
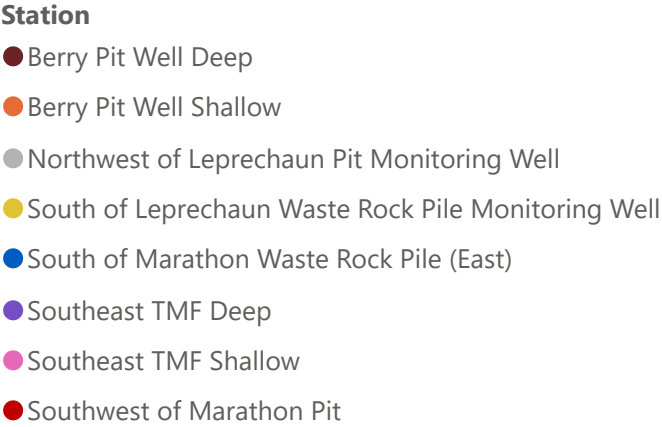


Zinc (mg/l) by Sample Date and Station

- Station
- Berry Pit Well Deep
 - Berry Pit Well Shallow
 - Northwest of Leprechaun Pit Monitoring Well
 - South of Leprechaun Waste Rock Pile Monitoring Well
 - South of Marathon Waste Rock Pile (East)
 - Southeast TMF Deep
 - Southeast TMF Shallow
 - Southwest of Marathon Pit



Nickel (mg/l) by Sample Date and Station



Iron (mg/l) by Sample Date and Station

