# TECHNICAL MEMORANDUM

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| **To:** | **Ashleigh Crompton, Mike Champion, Jackie Boruch, Ryan Schucroft, Jamie Maxwell (Woodfibre LNG)** | **Date:** | **17 May 2024** |
| **From:** | **Holly Pelletier and Patrick Mueller (Lorax)** | **Project #:** | **A633-7** |
| **Subject:** | **PE-111578 Weekly Discharge and Compliance Report #13 for May 5 – May 11** | | |

Waste Discharge Authorization Effluent Permit PE-111578 was issued by the British Columbia Energy Regulator (BCER) to Woodfibre LNG on February 9, 2024. The permit specifies monitoring and reporting requirements that are required to be met by Woodfibre LNG during construction of the LNG Export Facility. Reporting is required on a weekly basis.

Discharge and compliance monitoring is conducted by on-site Environmental Monitors (Roe Environmental) that are sub-contracted to the civil works contractor (LB LNG). Analytical samples are submitted by Roe Environmental to ALS Environmental in Burnaby, BC, for testing. Lorax Environmental provides water quality database management and WDA compliance reporting services for Woodfibre LNG.

This technical memorandum (Report #13) was prepared by Lorax Environmental and summarizes monitoring conducted the week of May 5 – May 11 for contact waters directed to a WWTP or a sedimentation pond and presents monitoring data that were available at the time of reporting including results that were pending from prior reporting periods. Figures referenced in the report discussion are included at the end of this report. Report #13 has been prepared to meet the reporting requirements specified in Condition 4.2 of WDA Effluent Permit PE-111578:

> "The Permittee shall summarize the results of the discharge and compliance monitoring program in a report that shall be submitted to the BCER weekly over the term of this permit. Reports must include suitable tabulated data. The table must include any applicable regulatory limits/guidelines e.g. permit limits, BC Water Quality Guidelines etc. Any exceedances of respective regulatory limits/guidelines must be clearly highlighted. Any missed sampling events/missing data must be identified with an explanation provided. Reporting frequency may be reduced upon a history of compliance and by written confirmation from the BCER. These reports shall be submitted to Waste.Management@bc-er.ca. A copy of the reports shall be provided to each First Nation consulted with regarding this subject permit, and also made publicly available on the Woodfibre LNG Environmental Reporting webpage."

# 1. Current Conditions

The Construction Phase of the Woodfibre LNG Export Facility commenced in October 2023. Early stage civil works are ongoing, and these include site grading, levelling, bedrock excavation and sedimentation pond and WWTP construction. Shoring works along the shoreline and foreshore areas were initiated in December 2023, and in early 2024 construction of water management infrastructure was initiated and has continued through the May 5 – May 11 monitoring period. The East WWTP, and East and West sedimentation ponds have been completed, and the West WWTP is being assembled. The PE- 111578 water management facilities that are completed or were under construction during the reporting period are shown in Figure 1.

The East and West Catchment contact water conveyance ditches described in PE-111578 will be constructed following completion of site preparation activities (*e.g.,* site grading, bedrock excavation) along the ditch lines. Until the ditches are operational, non-contaminated contact waters are managed to remain on site or are directed to the East Sedimentation Pond. Contaminated contact waters are contained and directed to the East WWTP.

The installation schedule for the East Sedimentation Pond permanent outfall structure has been extended beyond May 20 and a revised schedule is being developed. Until those structures are constructed, a temporary discharge system (*i.e.,* pump, hosing and diffusor) has been established to convey East Sedimentation Pond effluent to the authorized discharge location when necessary for the discharge of excess water, and if the effluent water quality meets the requirements set out in PE-111578.

Pilot testing of the East WWTP continued during the monitoring period (May 5 – May 11). Contaminated and potentially contaminated contact waters from excavations within the East Catchment were directed to the East WWTP for treatment. East Sedimentation Pond water near the effluent intake was also recirculated to the East WWTP each day during the monitoring period. A total of 3,218 $m^3$ treated effluent was discharged to the East Sedimentation Pond, the majority of this total was from pond water that was removed and directed to the East WWTP for treatment.

Non-contaminated contact waters from the East and West Catchments were not directed to the East Sedimentation Pond during the monitoring period (May 5 – May 11). Figure 2 shows an areal view of the pond on May 10. A total of 49.5 $m^3$ of East Sedimentation Pond effluent was pumped to the discharge location (SP-E-OUT) during the monitoring period on May 8. Clean-out of the East Sedimentation Pond began on May 9$^{th}$ by agitating accumulated sediment in Cells 1 and 2 of the pond using pumps and directing the sediment laden water to the East WWTP for treatment.

The West Sedimentation Pond is complete, except for the outfall structure (Figure 3). Commissioning of the West WWTP has been rescheduled for the end of June, after the West Sedimentation Pond is commissioned for use. There were no discharges from the West Sedimentation Pond to the receiving environment during the monitoring period (May 5 – May 11).

The completed non-contact water diversion ditch west of Mill Creek was commissioned for use on April 7. The diversion ditch discharges to Mill Creek at OUT-06 (Figure 1). Monitoring stations OUT-01, OUT-02, and OUT-11 at pre-existing culvert outlets have been established. Non-contact water diversion ditches leading to these outlets will be upgraded and extended, later in the construction schedule.

## 2. Monitoring Summary

The PE-111578 authorized works were under construction during the May 5 – May 11 monitoring period. Compliance monitoring stations are progressively established by as water management infrastructure is completed. Monitoring is conducted by the on-site Environmental Monitors (Roe Environmental). Analytical samples are submitted by Roe Environmental to ALS Environmental in Burnaby, BC, for testing.

The following monitoring stations have been established (Figure 1):

- Creek water (SW-01, SW-02, SW-03, SW-04, SW-07).
- Howe Sound reference and IDZ locations (WQR1, WQR2, IDZ-E1 and IDZ-E2).
- Non-contact diversion ditch outlets (OUT-01, OUT-02, OUT-06, and OUT-11).
- Contact water monitoring locations (WWTP-E-IN, WWTP-E-OUT, SP-E-IN-2, SP-E-OUT, SP-E-NE, and SP-E-NW).

Stations SW-01, SW-02, SW-03, SW-04, SW-07, WQR1, WQR2, IDZ-E1, IDZ-E2, OUT-02, WWTP-E-IN, WWTP-E-OUT, SP-E-NE, SP-E-NW, and SP-E-OUT were monitored during the monitoring period (May 5 – May 11). Sampling dates and parameters tested are summarized in Table 1.

## Table 1: Summary of PE-111578 monitoring samples collected May 5 – May 11.

| Sampling Date | Sample | Description | Parameters Tested |
|---|---|---|---|
| May 5, 2024 | IDZ-E1-0.5 | IDZ monitoring station 20-30 m southeast of East Sedimentation Pond discharge (SP-E-Out); 0.5 m below surface | Physical and General Parameters, Total, Dissolved and Speciated Metals. |
| | IDZ-E1-2m | IDZ monitoring station 20-30 m southeast of East Sedimentation Pond discharge (SP-E-Out); 2 m below surface | |
| | IDZ-E1-SF | IDZ monitoring station 20-30 m southeast of East Sedimentation Pond discharge (SP-E-Out); 2 m above the seafloor | |
| | IDZ-E2-0.5 | IDZ monitoring station 20-30 m southwest of East Sedimentation Pond discharge (SP-E-Out); 0.5 m below surface | |
| | IDZ-E2-2m | IDZ monitoring station 20-30 m southwest of East Sedimentation Pond discharge (SP-E-Out); 2 m below surface | |
| | IDZ-E2-SF | IDZ monitoring station 20-30 m southwest of East Sedimentation Pond discharge (SP-E-Out); 2 m above the seafloor | |
| | WQR1-0.5 | Reference site located northeast of East Creek 500 m northeast of the Project boundary; 0.5 m below surface. | |
| | WQR1-2m | Reference site located northeast of East Creek 500 m northeast of the Project boundary; 2 m below surface. | |
| | WQR1-SF | Reference site located northeast of East Creek 500 m northeast of the Project boundary; 2 m above the seafloor. | |
| | SP-E-NE | NE corner of East Sedimentation Pond proximal to the intake of the discharge pump | |
| | SP-E-NW | NW corner of East Sedimentation Pond proximal to the influent location | |
| | WWTP-E-IN | Combined influent to the East WWTP from chromium reduction pre- treatment step and additional contaminant sources within the East catchment area | Field Parameters. |
| | WWTP-E-OUT | Effluent from the East WWTP discharged to the East Sedimentation Pond | |
| May 6, 2024 | SP-E-NE | NE corner of East Sedimentation Pond proximal to the effluent intake | Field, Physical and General Parameters, Total, Dissolved and Speciated Metals. |
| | WWTP-E-IN | Combined influent to the East WWTP from chromium reduction pre- treatment step and additional contaminant sources within the East catchment area | |
| | WWTP-E-OUT | Effluent from the East WWTP discharged to the East Sedimentation Pond | |
| May 7, 2024 | IDZ-E1-0.5 | IDZ monitoring station 20-30 m southeast of East Sedimentation Pond discharge (SP-E-Out); 0.5 m below surface | Physical and General Parameters, Total, Dissolved and Speciated Metals. |
| | IDZ-E2-0.5 | IDZ monitoring station 20-30 m southwest of East Sedimentation Pond discharge (SP-E-Out); 0.5 m below surface | |
| | SP-E-NE | NE corner of East Sedimentation Pond proximal to the intake of the discharge pump | Field Parameters. |
| | WWTP-E-IN | Combined influent to the East WWTP from chromium reduction pre- treatment step and additional contaminant sources within the East catchment area | |
| | WWTP-E-OUT | Effluent from the East WWTP discharged to the East Sedimentation Pond | |
| May 8, 2024 | IDZ-E1-0.5 | IDZ monitoring station 20-30 m southeast of East Sedimentation Pond discharge (SP-E-Out); 0.5 m below surface | Field, Physical & General Parameters, VH & BTEX, EPHs & PAHs, Total, Dissolved and Speciated Metals, VOCs, Dioxins and Furans, Glycols, Oil and Grease, and Methyl Mercury. |
| | IDZ-E1-2m | IDZ monitoring station 20-30 m southeast of East Sedimentation Pond discharge (SP-E-Out); 2 m below surface | |
| | IDZ-E1-SF | IDZ monitoring station 20-30 m southeast of East Sedimentation Pond discharge (SP-E-Out); 2 m above the seafloor | |
| | IDZ-E2-0.5 | IDZ monitoring station 20-30 m southwest of East Sedimentation Pond discharge (SP-E-Out); 0.5 m below surface | |
| | IDZ-E2-2m | IDZ monitoring station 20-30 m southwest of East Sedimentation Pond discharge (SP-E-Out); 2 m below surface | |
| | IDZ-E2-SF | IDZ monitoring station 20-30 m southwest of East Sedimentation Pond discharge (SP-E-Out); 2 m above the seafloor | |
| | WQR1-0.5 | Reference site located northeast of East Creek 500 m northeast of the Project boundary; 0.5 m below surface. | |
| | WQR1-2m | Reference site located northeast of East Creek 500 m northeast of the Project boundary; 2 m below surface. | |
| | WQR1-SF | Reference site located northeast of East Creek 500 m northeast of the Project boundary; 2 m above the seafloor. | |
| | WQR2-0.5 | Reference site located south of Woodfibre Creek and 500 m south of the Project boundary; 0.5 m below surface. | |
| | WQR2-2m | Reference site located south of Woodfibre Creek and 500 m south of the Project boundary; 2 m below surface. | |
| | WQR2-SF | Reference site located south of Woodfibre Creek and 500 m south of the Project boundary; 2 m above the seafloor. | |
| | SP-E-OUT | Discharge from the East Sedimentation Pond to Howe Sound (compliance point) | |
| | SP-E-NE | NE corner of East Sedimentation Pond proximal to the intake of the discharge pump | Field Parameters. |
| | WWTP-E-IN | Combined influent to the East WWTP from chromium reduction pre- treatment step and additional contaminant sources within the East catchment area | |
| | WWTP-E-OUT | Effluent from the East WWTP discharged to the East Sedimentation Pond | |
| May 9, 2024 | SW-02 | Upper Reach of Mill Creek (upstream of the third bridge) | Field, Physical & General Parameters, VH & BTEX, EPHs & PAHs, Total, Dissolved and Speciated Metals, VOCs, Dioxins and Furans. |
| | SW-03 | Lower Reach of Mill Creek (near the mouth, in the estuarine zone) | |
| | SW-07 | Upstream Mill Creek (at the diversion inlet) | |
| | SP-E-NE | NE corner of East Sedimentation Pond proximal to the intake of the discharge pump | Field Parameters. |
| | WWTP-E-IN | Combined influent to the East WWTP from chromium reduction pre- treatment step and additional contaminant sources within the East catchment area | |
| | WWTP-E-OUT | Effluent from the East WWTP discharged to the East Sedimentation Pond | |
| May 10, 2024 | OUT-02 | Non-Contact Water Diversion Ditch Outlet | Field, Physical & General Parameters, Total, Dissolved and Speciated Metals, Glycols, Oil and Grease, and Methyl Mercury. |
| | SW-01 | Lower Reach of Woodfibre Creek (near the mouth) | Field, Physical & General Parameters, VH & BTEX, EPHs & PAHs, Total, Dissolved and Speciated Metals, VOCs, Dioxins and Furans, Glycols, Oil and Grease, and Methyl Mercury. |
| | SW-04 | Lower Reach of East Creek (near the outlet to the outfall culvert) | |
| | SP-E-NE | NE corner of East Sedimentation Pond proximal to the intake of the discharge pump | Field, Physical & General Parameters, Total, Dissolved and Speciated Metals. |
| | WWTP-E-IN | Combined influent to the East WWTP from chromium reduction pre- treatment step and additional contaminant sources within the East catchment area | Field, Physical & General Parameters, VH & BTEX, EPHs & PAHs, Total, Dissolved and Speciated Metals, VOCs, Dioxins and Furans, Glycols, Oil and Grease, and Methyl Mercury. |
| | WWTP-E-OUT | Effluent from the East WWTP discharged to the East Sedimentation Pond | |
| May 11, 2024 | SP-E-NE | NE corner of East Sedimentation Pond proximal to the intake of the discharge pump | Field Parameters. |
| | WWTP-E-IN | Combined influent to the East WWTP from chromium reduction pre- treatment step and additional contaminant sources within the East catchment area | |
| | WWTP-E-OUT | Effluent from the East WWTP discharged to the East Sedimentation Pond | |

# 3. Water Quality Results

## 3.1 Overview

Field measurements and monthly monitoring of the receiving environment for the PE-111578 monitoring stations were collected during the May 5 – May 11 monitoring period. Analytical results that were available at the time of reporting are listed below in Table 2. Analytical results that were not available at the time of reporting for samples collected during the May 5 – May 11 monitoring period will be included in future weekly reports when they are available for the following samples:

- WQR1, WQR2, IDZ-E1 and IDZ-E2 collected May 8 (analytical results not available)
- SP-E-OUT collected May 8 (only partial results available: TSS, general parameters, and total and dissolved metals)
- SW-03, SW-03, and SW-07 collected May 9 (only field results available)
- OUT-02 collected May 10 (only field results available)
- SW-01 and SW-04 collected May 10 (only field results available)
- WWTP-E-IN and WWTP-E-OUT collected May 10 (only field results available)

**Table 2: Summary of Analytical Results Included in Weekly Discharge and Compliance Report #13**.

| Sample | Description | Sampling Date | Parameters Reported |
|---|---|---|---|
| IDZ-E1-0.5 | IDZ monitoring station 20-30 m southeast of East Sedimentation Pond discharge (SP-E-Out); 0.5 m below surface | May 5, 2024 | TSS, Total and Dissolved Metals, and Hexavalent Chromium |
| IDZ-E1-2m | IDZ monitoring station 20-30 m southeast of East Sedimentation Pond discharge (SP-E-Out); 2 m below surface | | |
| IDZ-E1-SF | IDZ monitoring station 20-30 m southeast of East Sedimentation Pond discharge (SP-E-Out); 2 m above the seafloor | | |
| IDZ-E2-0.5 | IDZ monitoring station 20-30 m southwest of East Sedimentation Pond discharge (SP-E-Out); 0.5 m below surface | | |
| IDZ-E2-2m | IDZ monitoring station 20-30 m southwest of East Sedimentation Pond discharge (SP-E-Out); 2 m below surface | | |
| IDZ-E2-SF | IDZ monitoring station 20-30 m southwest of East Sedimentation Pond discharge (SP-E-Out); 2 m above the seafloor | | |
| WQR1-0.5 | Reference site located northeast of East Creek 500 m northeast of the Project boundary; 0.5 m below surface. | | |
| WQR1-2m | Reference site located northeast of East Creek 500 m northeast of the Project boundary; 2 m below surface. | | |
| WQR1-SF | Reference site located northeast of East Creek 500 m northeast of the Project boundary; 2 m above the seafloor. | | |
| SP-E-NE | NE corner of East Sedimentation Pond proximal to the intake of the discharge pump | | |
| SP-E-NW | NW corner of East Sedimentation Pond proximal to the influent location | | |
| SP-E-NE | NE corner of East Sedimentation Pond proximal to the intake of the discharge pump | May 6, 2024 | Field, Physical and General Parameters, Total and Dissolved Metals, and Hexavalent Chromium |
| WWTP-E-IN | Combined influent to the East WWTP from chromium reduction pre- treatment step and additional contaminant sources within the East catchment area | | |
| WWTP-E-OUT | Effluent from the East WWTP discharged to the East Sedimentation Pond | | |
| IDZ-E1-0.5 | IDZ monitoring station 20-30 m southeast of East Sedimentation Pond discharge (SP-E-Out); 0.5 m below surface | May 7, 2024 | TSS, Total and Dissolved Metals, and Hexavalent Chromium |
| IDZ-E2-0.5 | IDZ monitoring station 20-30 m southwest of East Sedimentation Pond discharge (SP-E-Out); 0.5 m below surface | | |
| SP-E-OUT | Discharge from the East Sedimentation Pond to Howe Sound (compliance point) | May 8, 2024 | Field Parameters and Partial Data for General Parameters, TSS, Total and Dissolved Metals, and Hexavalent Chromium |
| SP-E-NE | NE corner of East Sedimentation Pond proximal to the intake of the discharge pump | May 10, 2024 | Field, Physical & General Parameters, Total, Dissolved and Hexavalent Chromium |

## 3.2 East Sedimentation Pond

The East Sedimentation Pond influent and effluent results are screened against PE-111578 discharge limits. Parameters without a discharge limit are screened against BC and Federal water quality guidelines (WQGs) for the protection of marine water aquatic life. Influent water is not discharged from site, therefore only effluent water quality is assessed for exceedances. The analytical results, daily field parameters, discharge limits and WQGs are summarized in Table B- 1 (analytical results) and Table B-2 (field measurements) of Appendix B. Screening results are summarized in Table 3 and Table 4 for parameter concentrations that are above a guideline value.

The in-pond samples (station SP-E-NE) collected May 5 and May 6 proximal to the effluent intake (Figure 1) were tested for total and dissolved metals and met PE-111578 discharge limits.

In the May 8 effluent sample (SP-E-OUT), the total vanadium concentration was 1.5 times above the respective PE-111578 discharge limit (Table 3). The analytical results were received May 11 and site reports indicate water management corrective actions were implemented upon receipt of analytical results and included suspending further discharge from the East Sedimentation Pond on May 11. The pond did not discharge May 5 – May 11, except on May 8 for a 30 minute duration. An effluent quality exceedance notification was issued to BCER on May 13. Congruent monitoring was conducted in the marine receiving environment on May 8 at IDZ (IDZ-E1 and IDZ-E2) and reference stations (WQR1 and WQR2). The follow-up investigation initiated May 11 determined the exceedance was caused by the dissolved form of vanadium that is not removed by particle settling in the sedimentation pond, and that these waters will require WWTP treatment for the removal of dissolved vanadium. Discharge from the East Sedimentation Pond will remain suspended until pond sediment removal is completed, and follow-up monitoring data indicate dissolved vanadium has been reduced, and that pond water meets discharge limits.

The effluent sample collected on May 8 met WQG for parameters without discharge limits except, total hexavalent chromium which was detected at a concentration of 0.00156 mg/L, 1.04 times above the WQG value of 0.0015 mg/L (Table 4). This concentration is in the range of baseline values observed in marine water samples and the mixing zone model indicates the concentration would be diluted to below the WQG within the initial dilution zone defined in PE-111578.

## Table 3:
## Summary of Discharge Limit Exceedances for Effluent Discharged from the East Sedimentation Pond Station SP-E-OUT.

| Parameter | Units | Discharge Limit | N | N > Discharge Limit | Commentary |
|---|---|---|---|---|---|
| Total Vanadium | mg/L | 0.0081 | 1 | 1 | Analytical results collected on May 8 from SP-E-OUT showed parameters concentrations above the discharge limit for total vanadium (0.0118 mg/L).<br><br>Discharge from the East Sedimentation Pond was conducted based on favorable water quality for an in-pond sample collected May 6 (SP-E-NE). To confirm the effluent would continue to meet discharge limits during discharge, discharge was activated for 30 minutes on May 8. Discharge was stopped after effluent sampling was completed. Follow-up investigation determined the exceedance was caused by the dissolved form of vanadium that is not removed by particle settling in the sedimentation pond and has been accumulating in the sedimentation pond waters since April 29. Discharge from the East Sedimentation Pond will remain suspended until pond sediment removal initiated on May 8 is completed, and follow-up monitoring data indicate dissolved vanadium has been reduced, and that pond water meets discharge limits. This item remains open. |

PE-111578 discharge limits for the East Sedimentation Pond.
N = number of samples.
Non-detect results are screened using the detection limit value.

## Table 4:
## Summary of WQG Exceedances for the East Sedimentation Pond at Effluent Station SP-E-OUT.

| Parameter | Units | WQG (LT) | N | N >WQG | Commentary |
|---|---|---|---|---|---|
| Total Hexavalent Chromium | mg/L | 0.0015 (BC and Federal) | 1 | 1 | The total hexavalent chromium concentration was 1.04 times greater than the long-term Federal and BC WQG in the sample from SP-E-OUT collected on May 8 (0.00156 mg/L). East Sedimentation Pond discharged for 30 minutes on May 8 (49.5 $m^3$). This concentration is in the range of baseline values observed in marine water samples and the mixing zone model indicates the concentration would be diluted to below the WQG within the initial dilution zone defined in PE-111578. |

WQG = British Columbia or Canadian Water Quality Guideline for the Protection of Aquatic Life. LT = long-term freshwater or estuarine aquatic life guideline. Variable dependant guidelines were calculated for each sample using sample specific parameter values. The nearest boundary value was used if a variable was outside the formula range.
N = number of samples.
Non-detect results are screened using the detection limit value.

### 3.3 East Wastewater Treatment Plant

The East WWTP influent and effluent results are screened against the minimum discharge objectives (MDOs) which the WWTP was designed to meet. Contaminated contact water is directed to the WWTP influent, and it is expected that influent water is unlikely to meet MDOs, therefore only effluent water quality is assessed for exceedances. The analytical results, daily field measurements, and MDOs are summarized in Table C-1 (analytical results) and Table C-2 (field measurements) of Appendix C. Screening results are summarized in Table 5 for parameter concentrations that are above a guideline value.

The East WWTP discharged treated effluent to the East Sedimentation Pond each day of the reporting period (May 5 – May 11). Field measurements were collected each day at the influent and effluent stations, WWTP-E-IN and WWTP-E-OUT, respectively. Analytical samples were collected from the influent and effluent stations on May 6 and were measured for general and physical parameters, total and dissolved metals, and hexavalent chromium. Analytical samples were also collected from the influent and effluent stations on May 9; however, results were not available at the time of reporting.

Analytical results for the May 6 East WWTP effluent sample (WWTP-E-OUT) met MDOs, except for total vanadium. The total vanadium concentration in the effluent sample (0.00631 mg/L) was 1.3 times greater than the MDO (0.005 mg/L) and is predominately present in the dissolved form (0.00614 mg/L). The total vanadium concentration at the effluent station is comparable to the concentration observed at the influent station (WWTP-E-IN; 0.00614 mg/L). These results are being evaluated as part of the WWTP pilot trials to identify process adjustments that would improve dissolved vanadium removal.

During the monitoring period, East WWTP effluent (WWTP-E-OUT) water quality ranged from pH 7.15 to 8.85, turbidity ranged 0.38 to 2.09 NTU and dissolved oxygen ranged from 6.95 to 13.2 mg/L (Appendix C, Table C-2). The effluent field measurement met the MDOs, except pH on May 7 (pH 8.85) and dissolved oxygen on May 5, 8 and 11 (6.95, 7.59, and 7.34 mg/L, respectively). Pilot testing of the East WWTP is underway and occasional, deviations from MDOs may occur during this phase of WWTP operation.

**Table 5:**
**Summary of MDO Exceedances for the East WWTP at Effluent Station WWTP-E-OUT.**

| Parameter | Units | MDO | N | N >MDO | Commentary |
|---|---|---|---|---|---|
| Field pH | s.u. | 7.0 - 8.7 | 7 | 1 | Field pH was 0.12 s.u. above the upper MDO for pH in the field measurement collected from WWTP-E-OUT on May 7 (pH 8.85). Monitoring results indicate from May 8 – 11, the East WWTP resumed producing effluent that met MDO for field pH. |
| Field DO | mg/L | >=8 | 7 | 3 | Field DO measurements were below the lower limit MDO for DO in the field measurement collected from WWTP-E-OUT on May 5, 8, and 11 (6.95, 7.59, and 7.34 mg/L). |
| Total Vanadium | mg/L | 0.005 | 1 | 1 | The total vanadium concentration was 1.3 times greater than the MDO in the sample from WWTP-E-OUT collected on May 6 (0.00631 mg/L). The total vanadium concentration is predominately in the dissolved form and dissolved vanadium concentrations are comparable in the East WWTP influent (WWTP-E-IN; 0.00614 mg/L) and the effluent (0.00606 mg/L). These results are being evaluated as part of the WWTP pilot trials to identify process adjustments that would improve dissolved vanadium removal. |

MDO = Minimum discharge objective.
N = number of samples.
Non-detect results are screened using the detection limit value.

### 3.4 Marine Water Receiving Environment

Marine water receiving environment samples are screened against BC and Federal WQG for the protection of marine water aquatic life. Parameter concentrations above a WQG value, but within the range of values observed in the baseline monitoring program are considered to represent the natural condition of the water and are not flagged as exceedances. The analytical results, field parameters and WQGs are summarized in Table D-1 (analytical results) and Table D-2 (field measurements) of Appendix D. Screening results are summarized in Table 6 for parameter concentrations that are above a guideline value.

Follow-up investigation and monitoring was conducted in the initial dilution zone (IDZ) and marine reference stations for field and analytical parameters on May 5 following the May 3 East Sedimentation Pond effluent quality exceedance as described in Report #12. Water column samples were collected at stations IDZ-E1, IDZ-E2, and WQR1 at 0.5 and 2 m below the water surface and 2 m above the seafloor. Further sampling was conducted at IDZ-E1 and IDZ-E2 at 0.5 m below the water surface on May 7. The marine receiving environment samples collected on May 5 and 7 were tested for TSS, total and dissolved metals, and hexavalent chromium.

The May 8 monitoring of marine receiving environment stations (IDZ-E1, IDZ-E2, WQR1, and WQR2) was conduction as per requirements outlined in PE-111578; however, analytical results were not available at the time of reporting. Field measurements were collected and results will be reported when the corresponding lab results are available.

Results for samples collected on May 5 and 7 are within WQG values, except for total boron in several samples as well as total copper, total lead and total zinc in one May 5 sample from IDZ- E1 at 0.5 m below the water surface. The concentrations of total boron in the samples ranged from 1.17 to 3.98 mg/L and were above the WQG (1.2 mg/L) in all samples except samples from IDZ-E1 at 0.5 m below surface on May 5 and 7. The concentrations of total boron observed in the IDZ-E1, IDZ-E2, WQR1, and WQR2 samples are within the concentration ranges observed in the pre-construction baseline monitoring program and are therefore not considered to be exceedances.

Total Cu (0.00744 mg/L), T-Pb (0.00201 mg/L), and T-Zn (0.0176 mg/L) concentrations exceeded the applicable WQGs in the sample collected from IDZ-E1 on May 5 at 0.5 m below surface. The observed concentrations were near or above the upper range observed in the baseline dataset for each parameter. Although total copper, total lead and total zinc concentrations were elevated and similar to those observed the May 3 effluent sample, total vanadium at IDZ-E1 0.5 m depth was approximately 10% of the concentration detected in the effluent. Evaluation of the May 5 IDZ-E1 0.5 m sample water quality suggests sedimentation pond effluent, if present, would have been diluted approximately 2-fold by shallow seawater at the sampling location. Based on a comparison of the water quality results for the May 3 effluent and May 5 IDZ-E1 marine water, and accounting

for a 2-fold dilution of effluent, it is unlikely that the May 5 marine water exceedances originated from the May 3 and 4 effluent discharges.

**Table 6:**
**Summary of WQG Exceedances for Marine Water Analytical Samples Collected May 5 and May 7, 2024.**

| Parameter | Units | WQG (LT) | Location | N | N >WQG | Commentary |
|---|---|---|---|---|---|---|
| Total Copper | mg/L | 0.002 (BC) | Surface | 8 | 1 | Total copper exceeded the long-term and short-term BC WQG in the surface water sample at station IDZ-E1 at 0.5 m below the water surface on May 5 (0.00744 mg/L). The observed concentration was above the upper range observed in the baseline dataset. Based on evaluation of effluent and marine water quality results, it is unlikely that the May 5 marine water exceedances originated from East Sedimentation Pond effluent discharge. |
| | | | Deep | 3 | 0 | |
| Total Lead | mg/L | 0.002 (BC) | Surface | 8 | 1 | Total lead exceeded the long-term BC WQG in the surface water sample at station IDZ-E1 at 0.5 m below the water surface on May 5 (0.00201 mg/L). The observed concentration was near the upper range observed in the baseline dataset. Based on evaluation of effluent and marine water quality results, it is unlikely that the May 5 marine water exceedances originated from East Sedimentation Pond effluent discharge. |
| | | | Deep | 3 | 0 | |
| Total Zinc | mg/L | 0.01 (BC) | Surface | 8 | 1 | Total zinc exceeded the long-term BC WQG in the surface water sample at station IDZ-E1 at 0.5 m below the water surface on May 5 (0.0176 mg/L). The observed concentration was near the upper range observed in the baseline dataset. Based on evaluation of effluent and marine water quality results, it is unlikely that the May 5 marine water exceedances originated from East Sedimentation Pond effluent discharge. |
| | | | Deep | 3 | 0 | |

WQG = British Columbia or Canadian Water Quality Guideline for the Protection of Aquatic Life. LT = long-term marine aquatic life guideline.
N = number of samples.
Non-detect results are screened using the detection limit value.

## 4. Quality Control

This section presents the results of the quality control (QC) evaluation for the PE-111578 weekly report (Table 7). The evaluation includes a review of field and lab QC, completeness of the weekly report (*i.e.*, pending data), completeness of the monitoring program, evaluation of compliance and review of water management activities. Any items flagged for follow-up will be carried forward in future reports until they are closed.

**Table 7: Weekly Report QC Evaluations and Ongoing Items.**

| QC Procedure | Observation | Investigation/Resolution |
|---|---|---|
| **Reporting Period (May 5 – May 11, Report #13)** | | |
| **Monitoring Program Evaluation** | PE-111578 contact water, non-contact water and initial dilution zone monitoring stations have not been fully established. | The PE-111578 authorized works were under construction during the reporting period. Monitoring stations are progressively established as water management infrastructure is completed. The East Sedimentation Pond and East WWTP are completed, and pilot testing of the East WWTP is ongoing. The East Sedimentation Pond was commissioned for discharge on April 15. The West Sedimentation Pond is complete, except the outfall structure and West WWTP is under construction. The West Sedimentation Pond is not commissioned for discharge and did not discharge. The non-contact water diversion ditch that discharges at station OUT-06 was commissioned for discharge on April 7, and stations for pre-existing outfalls OUT-01, OUT-02, and OUT-11 have also been established. |
| **Compliance Evaluation** | May 8 monitoring results for East Sedimentation Pond discharge exceeded the PE-111578 limits for total vanadium and WQG for total hexavalent chromium. | Discharge from the East Sedimentation Pond was conducted based on favorable water quality for an in-pond sample collected May 6 (SP-E-NE). To confirm the effluent would continue to meet discharge limits during discharge, discharge was activated for 30 minutes on May 8. Discharge was stopped after effluent sampling was completed. Follow-up investigation determined the exceedance was caused by the dissolved form of vanadium that is not removed by particle settling in the sedimentation pond and has been accumulating in the sedimentation pond waters since April 29. Discharge from the East Sedimentation Pond will remain suspended until pond sediment removal initiated on May 8 is completed, and follow-up monitoring data indicate dissolved vanadium has been reduced, and that pond water meets discharge limits. This item remains open. |
| **WWTP Performance Evaluation** | May 6 monitoring results for East WWTP indicate dissolved vanadium was not being removed by the treatment process. | The total vanadium concentration was predominately in the dissolved form and dissolved vanadium concentrations were comparable in the East WWTP influent (WWTP-E-IN; 0.00614 mg/L) and the effluent (0.00606 mg/L). These results are being evaluated as part of the WWTP pilot trials to identify process adjustments that would improve dissolved vanadium removal. |
| **Pending Data** | Analytical results for samples collected May 8 – 10 were not reported. Partial results (total and dissolved metals) for the sample collected May 8 from the East Sedimentation Pond discharge (SP-E-OUT) were reported in Section 3.2. | Complete analytical results were not available at the time of preparing Report #13 and are expected to be available for the next reporting period. Partial results for May 8 East Sedimentation Pond discharge sample (total and dissolved metals) were available and included in this report, however complete results were not available at the time of reporting. This item remains open. |
| **Ongoing Items from Previous Weekly Reports** | | |
| **Report #10:**<br>**Water Management Evaluation** | April 16 monitoring results for East Sedimentation Pond influent (station SP-E-IN-2) indicated contaminated contact water was directed to the pond. | On April 16, non-contaminated contact water that was previously pumped to a baker tank for storage was transferred to the sedimentation pond as influent. On April 18, after receiving the test results, site staff determined that the baker tank was previously used to store contaminated contact water and that residues from the tank were likely entrained in the water that was transferred from the baker tank to the pond influent.<br>Corrective actions were implemented by site staff on April 18 and included suspending further discharges until WQ monitoring indicated PAHs have been removed from the sedimentation pond, and recirculating water from the baker tanks used for storing non-contaminated contact water through the East WWTP until influent PAH concentrations indicate residual contamination has been removed.<br>Site staff collected a pond sample on April 18 proximal to the intake for the effluent discharge pump located in the northeast corner of the pond (SP-E-POND). PAHs met WQG in the April 18 sedimentation pond sample indicating the residual PAHs were removed from the pond waters.<br>Additional influent monitoring was conducted April 29 (SP-E-IN-2). PAHs were detected in the influent sample, and this is attributed to elevated TSS in the sample (192 mg/L). Further investigation of the potential source is ongoing. Note the concurrent April 29 East Sedimentation Pond effluent sample met WQGs for PAHs. This item remains open pending the results of additional influent monitoring for PAHs. |
| **Report #12:**<br>**Compliance Evaluation** | May 3 monitoring results for East Sedimentation Pond discharge exceeded the PE-111578 limits for total Cu, Pb, V, and Zn and WQG for total Hg. | Discharge from the East Sedimentation Pond was suspended following receipt of May 3 analytical results on May 4. Follow-up investigation and monitoring concluded that some settled sediments in the East Sedimentation Pond were likely re-suspended during discharge, resulting in the discharge limit exceedances observed in the May 3 sample. Removal of accumulated sediment commenced May 8. Follow-up monitoring will be conducted to confirm effluent compliance prior to resuming discharge. This item remains open. |
| **Report #12:**<br>**Pending Data** | Methyl mercury, dioxin and furan results for samples collected April 28-30 were not reported. | Methyl mercury, dioxins and furans results were not complete at the time of reporting. Testing of these parameters typically requires up to 4 weeks to complete. The pending results are expected at the end of May. This item remains open. |

**Notes**:
Result QA/QC screening includes the evaluation of field and lab QC results, comparison of total and dissolved metal results and review for modified detection limits.
Pending data are outstanding results from monitoring samples reported in the current or previous weekly reports.
Monitoring program evaluation is an assessment of the completeness of the monitoring program compared to PE-111578 requirements.

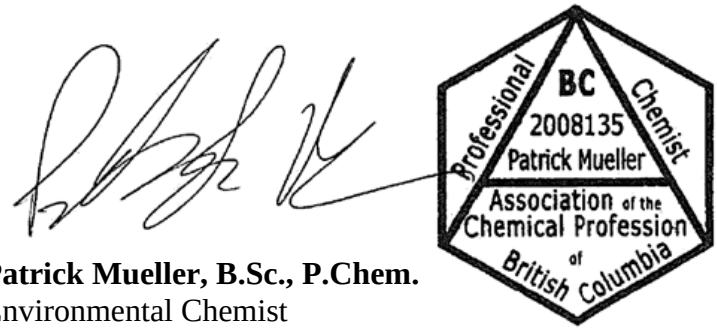
# 5. Closure

This weekly report is a desktop review by Lorax of the PE-111578 discharge and compliance monitoring program records, reports and results provided by Woodfibre LNG and prime contractor McDermott International and their sub-contractors. The records reviewed and analyzed by Lorax include ALS Environmental laboratory test reports and site reports (from Roe Environmental, LB LNG, McDermott and Woodfibre LNG). Verbal or electronic communications between Lorax, and Roe Environmental, LB LNG, McDermott, Woodfibre LNG and Keystone Environmental staff are conducted as needed to confirm the information presented in this report.

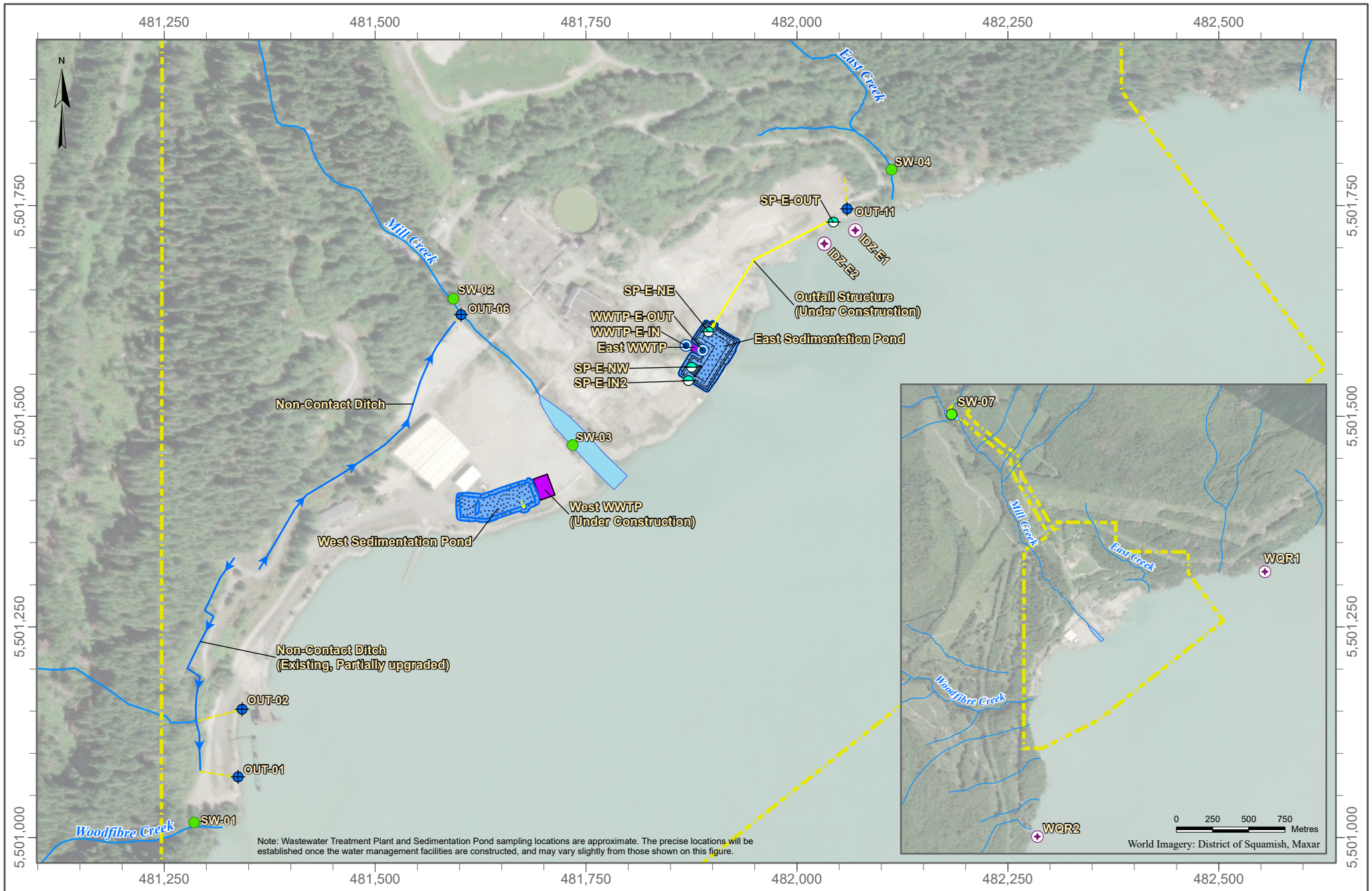
Regards,

**LORAX ENVIRONMENTAL SERVICES LTD.**

**Holly Pelletier, B.Sc., GIT**
Environmental Geoscientist




**Patrick Mueller, B.Sc., P.Chem.**
Environmental Chemist




**LEGEND**

- Freshwater Monitoring Station
- Marine Water Monitoring Station
- Certified Project Area
- Waterbody
- Watercourse
- Non-Contact Diversion Ditch
- Outfall
- Culvert Pipe
- Clean Water Diversion Discharge Station
- Sediment Pond
- Sediment Pond Monitoring Stations (Water Quality)
- WWTP

| | |
|---|---|
| DATE SAVED: | May 17, 2024 |
| DRAWN BY: | DM |
| REVIEWED: | PM |
| VERSION: | 1 |

***Coordinate System:*** *NAD 1983 UTM Zone 10N*
***Projection:*** *Transverse Mercator*
***Datum:*** *North American 1983*
***Units:*** *Metre*

**1:6,000**

0 50 100 150 Metres

CLIENT: Woodfibre LNG

LORAX ENVIRONMENTAL

PROJECT:

# Woodfibre LNG Project Construction Phase

TITLE: Completed or Under Construction Water Management Facilities and Established PE-111578 Monitoring Stations (May 11, 2024)

PROJECT #: A633-7

FIGURE: 1

P:\@Drafting\Woodfibre\Drafting Figures\APRX\WLNG Construction Phase 2024\WLNG Construction Phase 2024 - Weekly Reporting.aprx Figure 1 Monitoring and Compliance Locations

# *Appendix A: East and West Catchment Photographs*

**Figure 2. Areal view of the East WWTP and East Sedimentation Pond showing the placement of two sediment curtains. Water at the inlet (southwest) section of the pond is cloudy due to elevated TSS in the influent. A progression to less turbid water is observed in the sediment curtain cells from the pond inlet (bottom centre of photo) to the outlet (top centre of photo) (May 10, 2024).**

**Figure 3: Areal view showing the current stage of construction for the West Sedimentation Pond and West WWTP (located west of pond) on May 10, 2024.**

# *Appendix B: East Sedimentation Pond Results*

## Table B-1: Summary of East Sedimentation Pond Water Quality Results Received at the Time of Reporting.

| Parameter | Units | Lowest Applicable Marine Water Guideline [1, 2] | | PE-111578 Discharge Limit * | East Sedimentation Pond | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | In-Pond at Effluent Location | In-Pond at Influent Location | In-Pond at Effluent Location | Effluent | In-Pond at Effluent Location |
| | | | | | SP-E-NE | SP-E-NW | SP-E-NE | SP-E-OUT | SP-E-NE |
| | | | | | VA24A9802-001 | VA24A9802-002 | VA24A9887-003 | VA24B0178-013 | VA24B0447-001 |
| | | Long Term | Short Term | | 2024-05-05 13:17 | 2024-05-05 12:10 | 2025-05-06 14:11 | 2025-05-08 10:12 | 2025-05-10 14:45 |
| **General Parameters** | | | | | | | | | |
| pH - Field | pH units | - [6] | - | 5.5 - 9.0 | 7.47 | 7.93 | 7.80 | 7.39 | 8.70 |
| Specific Conductivity - Field | µS/cm | - | - | - | 277 | 129 | 223 | 1674 | 2159 |
| Temperature - Field | ℃ | - | - | - | 14.4 | 14.8 | 14 | 17.9 | 17.4 |
| Salinity - Field | ppt | - | - | - | 0.17 | 0.07 | 0.14 | 0.99 | 1.31 |
| Turbidity - Field | NTU | - | - | - | 3 | 24.9 | 0.98 | 1.01 | 0.66 |
| TSS | mg/L | - [6] | - | 25 | 5.1 | 24.7 | <3 | <3 | 3.9 |
| Dissolved Oxygen - Field | mg/L | >=8 | - | - | 8.45 | 25.81 | 11.16 | 8.34 | 8.99 |
| **Anions and Nutrients** | | | | | | | | | |
| Sulphate | mg/L | - | - | - | - | - | - | 89.2 | - |
| Chloride | mg/L | - | - | - | - | - | - | 457 | - |
| Fluoride | mg/L | - | 1.5 | - | - | - | - | <0.2 | - |
| Ammonia (N-$NH_3$) | mg/L | Variable [3] | Variable [3] | - | - | - | - | 0.0092 | - |
| Nitrite (N-$NO_2$) | mg/L | - | - | - | - | - | - | <0.01 | - |
| Nitrate (N-$NO_3$) | mg/L | 3.7 | 339 | - | - | - | - | 0.113 | - |
| **Total Metals** | | | | | | | | | |
| Aluminum, total (T-Al) | mg/L | - | - | - | 0.285 | 2.34 | 0.14 | 0.154 | 0.191 |
| Antimony, total (T-Sb) | mg/L | - | 0.27 [4] | - | 0.00252 | 0.00246 | 0.00203 | 0.00199 | 0.00218 |
| Arsenic, total (T-As) | mg/L | 0.0125 | 0.0125 | - | 0.00333 | 0.00431 | 0.00299 | 0.00324 | 0.0028 |
| Barium, total (T-Ba) | mg/L | - | - | - | 0.0034 | 0.0217 | 0.00233 | 0.0155 | 0.0162 |
| Beryllium, total (T-Be) | mg/L | 0.1 | - | - | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 |
| Boron, total (T-B) | mg/L | 1.2 | - | - | 0.057 | 0.066 | 0.057 | 0.132 | 0.188 |
| Cadmium, total (T-Cd) | mg/L | 0.00012 | - | - | <0.00002 | ***0.000135*** | 0.000015 | 0.0000106 | <0.00002 |
| Chromium, total (T-Cr) | mg/L | - | - | - | 0.00161 | 0.00389 | 0.00117 | 0.00181 | 0.00201 |
| Cobalt, total (T-Co) | mg/L | - | - | - | 0.00012 | 0.00078 | <0.0001 | <0.0001 | 0.0001 |
| Copper, total (T-Cu) | mg/L | - [6] | - [6] | 0.0043 | 0.0023 | 0.00796 | 0.00172 | 0.00169 | 0.00175 |
| Iron, total (T-Fe) | mg/L | - | - | - | 0.113 | 1.56 | 0.022 | 0.016 | 0.072 |
| Lead, total (T-Pb) | mg/L | - [6] | - [6] | 0.0035 | 0.000776 | 0.00846 | 0.000136 | 0.00031 | 0.000281 |
| Manganese, total (T-Mn) | mg/L | - | - | - | 0.00382 | 0.047 | 0.00139 | 0.00111 | 0.00275 |
| Mercury, total (T-Hg) [5] | mg/L | 0.000016 | - | - | <0.000005 | ***0.0000233*** | <0.000005 | <0.000005 | <0.000005 |
| Molybdenum, total (T-Mo) | mg/L | - | - | - | 0.0316 | 0.024 | 0.0316 | 0.0479 | 0.0337 |
| Nickel, total (T-Ni) | mg/L | 0.0083 | - | - | <0.0005 | 0.00175 | <0.0005 | <0.0005 | 0.00074 |
| Selenium, total (T-Se) | mg/L | 0.002 | - | - | 0.000197 | 0.000237 | 0.000256 | 0.000262 | 0.000176 |
| Silver, total (T-Ag) | mg/L | 0.0015 | 0.003 | - | <0.00001 | 0.000019 | <0.00001 | <0.00001 | <0.00001 |
| Thallium, total (T-Tl) | mg/L | - | - | - | <0.00001 | 0.000016 | <0.00001 | <0.00001 | <0.00001 |
| Uranium, total (T-U) | mg/L | - | - | - | 0.0203 | 0.0133 | 0.0192 | 0.0262 | 0.0175 |
| Vanadium, total (T-V) | mg/L | - [6] | - | 0.0081 | 0.00788 | 0.0117 | 0.00646 | 0.0118 | 0.00934 |
| Zinc, total (T-Zn) | mg/L | - [6] | - [6] | 0.0133 | 0.0056 | 0.0202 | <0.003 | <0.003 | 0.0041 |
| Hexavalent Chromium, total | mg/L | 0.0015 | - | - | 0.00142 | ***0.00188*** | 0.00110 | ***0.00156*** | 0.00142 |
| **Dissolved Metals** | | | | | | | | | |
| Cadmium, dissolved (D-Cd) | mg/L | - | - | - | <0.000015 | <0.000015 | <0.000015 | <0.000005 | <0.000015 |
| Copper, dissolved (D-Cu) | mg/L | - | - | - | 0.00174 | 0.0026 | 0.00158 | 0.00162 | 0.00143 |
| Iron, dissolved (D-Fe) | mg/L | - | - | - | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| Lead, dissolved (D-Pb) | mg/L | - | - | - | <0.00005 | <0.00005 | <0.00005 | 0.000095 | <0.00005 |
| Manganese, dissolved (D-Mn) | mg/L | - | - | - | 0.00049 | 0.00049 | 0.00033 | 0.00057 | 0.0008 |
| Strontium, dissolved (D-Sr) | mg/L | - | - | - | 0.108 | 0.0905 | 0.108 | 0.352 | 0.353 |
| Vanadium, dissolved (D-V) | mg/L | - | - | - | 0.00713 | 0.00782 | 0.00621 | 0.0121 | 0.00863 |
| Zinc, dissolved (D-Zn) | mg/L | - | - | - | 0.0022 | 0.0011 | 0.0014 | 0.0015 | 0.0029 |
| **Polycyclic Aromatic Hydrocarbons (PAHs)** | | | | | | | | | |
| Acenaphthene | mg/L | 0.006 | - | - | - | - | - | - [7] | - |
| Acridine | mg/L | - | - | - | - | - | - | - [7] | - |
| Anthracene | mg/L | - | - | - | - | - | - | - [7] | - |
| Benz(a)anthracene | mg/L | - | - | - | - | - | - | - [7] | - |
| Benzo(a)pyrene | mg/L | 0.00001 | - | - | - | - | - | - [7] | - |
| Chrysene | mg/L | 0.0001 | - | - | - | - | - | - [7] | - |
| Fluoranthene | mg/L | - | - | - | - | - | - | - [7] | - |
| Fluorene | mg/L | 0.012 | - | - | - | - | - | - [7] | - |
| 1-methylnaphthalene | mg/L | 0.001 | - | - | - | - | - | - [7] | - |
| 2-methylnaphthalene | mg/L | 0.001 | - | - | - | - | - | - [7] | - |
| Naphthalene | mg/L | 0.001 | - | - | - | - | - | - [7] | - |
| Phenanthrene | mg/L | - | - | - | - | - | - | - [7] | - |
| Pyrene | mg/L | - | - | - | - | - | - | - [7] | - |
| Quinoline | mg/L | - | - | - | - | - | - | - [7] | - |
| **Volatile Organic Compounds (VOCs)** | | | | | | | | | |
| Benzene | mg/L | 0.11 | - | - | - | - | - | - [7] | - |
| Ethylbenzene | mg/L | 0.25 | - | - | - | - | - | - [7] | - |
| Methyl-tert-butyl-ether | mg/L | 5 | 0.44 | - | - | - | - | - [7] | - |
| Styrene | mg/L | - | - | - | - | - | - | - [7] | - |
| Toluene | mg/L | 0.215 | - | - | - | - | - | - [7] | - |
| Total Xylenes | mg/L | - | - | - | - | - | - | - [7] | - |
| Chlorobenzene | mg/L | 0.025 | - | - | - | - | - | - [7] | - |
| 1,2-Dichlorobenzene | mg/L | 0.042 | - | - | - | - | - | - [7] | - |

**Notes:**
Results ***underlined in bold italics*** exceed the applicable long-term water quality guideline for the protection of marine water aquatic life.
Shaded results exceed the applicable short-term water quality guideline for the protection of marine water aquatic life.
Results in orange text exceeded the PE11578 East Sedimentation Pond Discharge Limit.
* The PE111578 East Sedimentation Pond Discharge Limit applies only to the point of discharge from the East Sedimentation Pond (SP-E-Out).
[1] Approved British Columbia Water Quality Guidelines for the protection of marine aquatic life (BC ENV, 2021). Where an approved guideline is not established, the working guideline is applied.
[2] Canadian Water Quality Guideline for the protection of marine aquatic life (CCME, 2021).
[3] The approved total ammonia nitrogen BC WQG is salinity, pH and temperature dependent; see Tables 26E and 26F in BC WQG guidance document (BC ENV, 2021).
[4] The working BC WQG for trivalent antimony [SB(III)] is 0.27 mg/L and is applied to total antimony results.
[5] When MeHg ⩽ 0.5% of total Hg, BC WQG = 0.00002 mg/L.
[6] Where discharge limits apply, the water quality guideline was not evaluated.
[7] Partial analytical results were available at the time of reporting for general parameters and total and dissolved metals. Complete analytical results for PAHs and VOCs were unavailable at the time of reporting and will be included in a future weekly report when available.
The lowest applicable guidelines are shown in the table; however, water quality data was screened to all applicable guidelines.

## Table B-2: Summary of East Sedimentation Pond Daily Field Parameters Received at the Time of Reporting.

| Station ID | Date | Time | Temperature | DO | Salinity | Turbidity | pH | Conductivity | Visibility of Sheen |
|---|---|---|---|---|---|---|---|---|---|
| | | | °C | mg/L | ppt | NTU | s.u. | µS/cm | |
| SP-E-NE | 05-05-2024 | 13:31 | 14.4 | 8.45 | 0.17 | 2.6 | 7.47 | 277.2 | No |
| SP-E-NW | 05-05-2024 | 13:11 | 14.8 | 25.81 | 0.07 | 24.9 | 7.93 | 128.9 | No |
| SP-E-NE | 06-05-2024 | 14:07 | 14.0 | 11.16 | 0.14 | 0.98 | 7.8 | 223.1 | No |
| SP-E-NE | 07-05-2024 | 11:52 | 14.9 | 10.87 | 0.21 | 1.1 | 8.84 | 352.5 | No |
| SP-E-NE | 08-05-2024 | 8:50 | 14.2 | 9.4 | 0.97 | 0.92 | 8.6 | 1498 | No |
| SP-E-OUT | 08-05-2024 | 10:12 | 17.9 | 8.34 | 0.99 | 1.01 | 7.39 | 1674 | No |
| SP-E-NE | 09-05-2024 | 10:30 | 15.9 | 12.82 | 1.16 | 1.17 | 7.14 | 1855 | No |
| SP-E-NE | 10-05-2024 | 10:46 | 17.4 | 8.99 | 1.31 | 0.66 | 8.7 | 2159 | No |
| SP-E-NE | 11-05-2024 | 16:37 | 18.7 | 5.85 | 3.74 | 2.27 | 8.4 | 5134 | No |

No water sources were pumped to the East Sedimentation Pond May 5 – 11, therefore station SP-E-IN-2 was not sampled.
Brief discharge from the East Sedimentation Pond occurred May 8.

# *Appendix C: East Wastewater Treatment Plant Results*

## Table C-1: Summary of East Wastewater Treatment Plant Water Quality Results Received at the Time of Reporting.

| Parameter | Unit | Minimum Discharge Objective[1] | East WWTP | |
|---|---|---|---|---|
| | | | **Influent** | **Effluent** |
| | | | **WWTP-E-IN** | **WWTP-E-OUT** |
| | | | **VA24A9887-001** | **VA24A9887-002** |
| | | | **2024-05-06 13:35** | **2024-05-06 13:56** |
| **General Parameters** | | | | |
| pH - Field | pH units | 7.0 - 8.7 | 7.46 | 7.63 |
| Specific Conductivity - Field | µS/cm | - | 251 | 226 |
| Temperature - Field | ℃ | - | 17.9 | 13.5 |
| Salinity - Field | ppt | - | 0.14 | 0.14 |
| Turbidity - Field | NTU | - | 12.61 | 0.67 |
| TSS | mg/L | - | 11.5 | <3 |
| Dissolved Oxygen - Field | mg/L | >=8 | 16.08 | 9.9 |
| **Anions and Nutrients** | | | | |
| Sulphate | mg/L | - | - | - |
| Chloride | mg/L | - | - | - |
| Fluoride | mg/L | - | - | - |
| Ammonia (N-$NH_3$) | mg/L | Variable [4] | - | - |
| Nitrite (N-$NO_2$) | mg/L | - | - | - |
| Nitrate (N-$NO_3$) | mg/L | 3.7 | - | - |
| **Total Metals** | | | | |
| Aluminum, total (T-Al) | mg/L | - | 0.841 | 0.136 |
| Antimony, total (T-Sb) | mg/L | - | 0.00208 | 0.00205 |
| Arsenic, total (T-As) | mg/L | 0.0125 | 0.00339 | 0.00272 |
| Barium, total (T-Ba) | mg/L | - | 0.00836 | 0.00236 |
| Beryllium, total (T-Be) | mg/L | 0.1 | <0.0001 | <0.0001 |
| Boron, total (T-B) | mg/L | 1.2 | 0.058 | 0.06 |
| Cadmium, total (T-Cd) | mg/L | 0.00012 | <0.00005 | <0.000015 |
| Chromium, total (T-Cr) | mg/L | - | 0.00185 | 0.0011 |
| Cobalt, total (T-Co) | mg/L | - | 0.00032 | <0.0001 |
| Copper, total (T-Cu) | mg/L | 0.002 | ***0.00408*** | 0.00181 |
| Iron, total (T-Fe) | mg/L | - | 0.686 | 0.019 |
| Lead, total (T-Pb) | mg/L | 0.002 | ***0.00234*** | 0.000118 |
| Manganese, total (T-Mn) | mg/L | - | 0.0166 | 0.00108 |
| Mercury, total (T-Hg) | mg/L | 0.000016 | 0.0000076 | <0.000005 |
| Molybdenum, total (T-Mo) | mg/L | - | 0.0286 | 0.0304 |
| Nickel, total (T-Ni) | mg/L | 0.0083 | ***0.0372*** | 0.00189 |
| Selenium, total (T-Se) | mg/L | 0.002 | 0.00019 | 0.000213 |
| Silver, total (T-Ag) | mg/L | 0.0015 | <0.00001 | <0.00001 |
| Thallium, total (T-Tl) | mg/L | - | <0.00001 | <0.00001 |
| Uranium, total (T-U) | mg/L | - | 0.0175 | 0.019 |
| Vanadium, total (T-V) [8] | mg/L | 0.005 | ***0.00812*** | ***0.00631*** |
| Zinc, total (T-Zn) | mg/L | 0.01 | ***0.272*** | 0.0037 |
| Hexavalent Chromium, total | mg/L | 0.0015 | 0.00121 | 0.00103 |
| **Dissolved Metals** | | | | |
| Cadmium, dissolved (D-Cd) | mg/L | - | <0.000015 | <0.00001 |
| Copper, dissolved (D-Cu) | mg/L | - | 0.0023 | 0.00166 |
| Iron, dissolved (D-Fe) | mg/L | - | 0.048 | <0.01 |
| Lead, dissolved (D-Pb) | mg/L | - | 0.000127 | <0.00005 |
| Manganese, dissolved (D-Mn) | mg/L | - | 0.00253 | 0.00028 |
| Strontium, dissolved (D-Sr) | mg/L | - | 0.10 | 0.107 |
| Vanadium, dissolved (D-V) | mg/L | - | 0.00614 | 0.00606 |
| Zinc, dissolved (D-Zn) | mg/L | - | 0.141 | 0.0039 |
| **Polycyclic Aromatic Hydrocarbons (PAHs)** | | | | |
| Acenaphthene | mg/L | 0.006 | - | - |
| Acridine | mg/L | - | - | - |
| Anthracene | mg/L | - | - | - |
| Benz(a)anthracene | mg/L | - | - | - |
| Benzo(a)pyrene | mg/L | 0.00001 | - | - |
| Chrysene | mg/L | 0.0001 | - | - |
| Fluoranthene | mg/L | - | - | - |
| Fluorene | mg/L | 0.012 | - | - |
| 1-methylnaphthalene | mg/L | 0.001 | - | - |
| 2-methylnaphthalene | mg/L | 0.001 | - | - |
| Naphthalene | mg/L | 0.001 | - | - |
| Phenanthrene | mg/L | - | - | - |
| Pyrene | mg/L | - | - | - |
| Quinoline | mg/L | - | - | - |
| **Volatile Organic Compounds (VOCs)** | | | | |
| Benzene | mg/L | 0.11 | - | - |
| Ethylbenzene | mg/L | 0.25 | - | - |
| Methyl-tert-butyl-ether | mg/L | 5 | - | - |
| Styrene | mg/L | - | - | - |
| Toluene | mg/L | 0.215 | - | - |
| Total Xylenes | mg/L | - | - | - |
| Chlorobenzene | mg/L | 0.025 | - | - |
| 1,2-Dichlorobenzene | mg/L | 0.042 | - | - |

**Notes:**
[1] Minimum discharge objective for the WWTP effluent.
Results ***underlined in bold italics*** exceed the applicable minimum discharge objective.

## Table C-2: Summary of East Wastewater Treatment Plant Daily Field Parameters Received at the Time of Reporting.

| Station ID | Date | Time | Temperature | DO | Salinity | Turbidity | pH | Conductivity | Visibility of Sheen |
|---|---|---|---|---|---|---|---|---|---|
| | | | °C | mg/L | ppt | NTU | s.u. | µS/cm | |
| WWTP-E-IN | 05-05-2024 | 13:17 | 14.3 | 14.57 | 0.14 | 11.45 | 7.87 | 232.4 | No |
| WWTP-E-OUT | 05-05-2024 | 13:25 | 14.0 | 6.95 | 0.14 | 0.54 | 7.46 | 232.9 | No |
| WWTP-E-IN | 06-05-2024 | 13:35 | 17.9 | 16.08 | 0.14 | 12.61 | 7.46 | 251.1 | No |
| WWTP-E-OUT | 06-05-2024 | 13:57 | 13.5 | 9.9 | 0.14 | 0.67 | 7.63 | 225.8 | No |
| WWTP-E-IN | 07-05-2024 | 11:44 | 21.9 | 8.48 | 0.13 | 12.28 | 8.85 | 257.4 | No |
| WWTP-E-OUT | 07-05-2024 | 11:55 | 14.6 | 10.63 | 0.2 | 0.77 | 8.85 | 330.3 | No |
| WWTP-E-IN | 08-05-2024 | 8:57 | 15.7 | 9.52 | 0.33 | 8.48 | 8.8 | 557 | No |
| WWTP-E-OUT | 08-05-2024 | 8:55 | 14.7 | 7.59 | 0.88 | 2.09 | 8.5 | 1390 | No |
| WWTP-E-IN | 09-05-2024 | 10:46 | 14.4 | 8.57 | 0.27 | 27.30 | 7.36 | 436.1 | No |
| WWTP-E-OUT | 09-05-2024 | 10:37 | 15.0 | 9.32 | 0.99 | 0.66 | 7.15 | 1566 | No |
| WWTP-E-IN | 10-05-2024 | 10:54 | 17.0 | 9.62 | 0.52 | 22.90 | 9.0 | 885 | No |
| WWTP-E-OUT | 10-05-2024 | 10:42 | 17.5 | 13.18 | 2.06 | 0.38 | 8.2 | 3320 | No |
| WWTP-E-IN | 11-05-2024 | 16:39 | 19.4 | 6.54 | 2.77 | 21.56 | 8.9 | 6787 | No |
| WWTP-E-OUT | 11-05-2024 | 16:32 | 20.4 | 7.34 | 3.02 | 1.28 | 8.4 | 1245 | No |

# *Appendix D: Marine Water Receiving Environment Results*

## Table D-1: Summary of Marine Water Quality Results Received at the Time of Reporting

| Parameter | Unit | Lowest Applicable Guideline [1, 2] | | Station IDZ-E1 | | | Station IDZ-E2 | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | 0.5 m Below Surface | 2 m Below Surface | 2 m Above Seafloor | 0.5 m Below Surface | 2 m Below Surface | 2 m Above Seafloor |
| | | | | IDZ-E1-0.5 | IDZ-E1-2m | IDZ-E1-SF | IDZ-E2-0.5 | IDZ-E2-2m | IDZ-E2-SF |
| | | | | VA24A9802-005 | VA24A9802-006 | VA24A9802-007 | VA24A9802-008 | VA24A9802-009 | VA24A9802-010 |
| | | Long Term | Short Term | 2024-05-05 14:37 | 2024-05-05 14:53 | 2024-05-05 15:02 | 2024-05-05 15:20 | 2024-05-05 16:00 | 2024-05-05 16:23 |
| **General Parameters** | | | | | | | | | |
| pH - Field | pH units | 7.0 - 8.7 | - | - | - | - | - | - | - |
| Conductivity - Field | µS/cm | - | - | - | - | - | - | - | - |
| Temperature - Field | ℃ | - | - | - | - | - | - | - | - |
| Salinity - Field | ppt | Narrative [3] | - | - | - | - | - | - | - |
| Turbidity - Field | NTU | Narrative [3] | Narrative [3] | - | - | - | - | - | - |
| TSS | mg/L | Narrative [3] | Narrative [3] | <2 | <2 | <2 | <2 | <2 | <2 |
| Dissolved Oxygen - Field | mg/L | >=8 | - | - | - | - | - | - | - |
| **Anions and Nutrients** | | | | | | | | | |
| Sulphate | mg/L | - | - | - | - | - | - | - | - |
| Chloride | mg/L | - | - | - | - | - | - | - | - |
| Fluoride | mg/L | - | 1.5 | - | - | - | - | - | - |
| Ammonia ($N\text{-}NH_3$) | mg/L | Variable [4] | Variable [4] | - | - | - | - | - | - |
| Nitrite ($N\text{-}NO_2$) | mg/L | - | - | - | - | - | - | - | - |
| Nitrate ($N\text{-}NO_3$) | mg/L | 3.7 | 339 | - | - | - | - | - | - |
| **Total Metals** | | | | | | | | | |
| Aluminum, total (T-Al) | mg/L | - | - | 0.0765 | 0.0298 | 0.0175 | 0.0709 | 0.0522 | 0.0192 |
| Antimony, total (T-Sb) | mg/L | - | 0.27 [5] | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| Arsenic, total (T-As) | mg/L | 0.0125 | 0.0125 | 0.00086 | 0.00181 | 0.00214 | 0.00088 | 0.0013 | 0.00234 |
| Barium, total (T-Ba) | mg/L | - | - | 0.0079 | 0.0061 | 0.0064 | 0.0077 | 0.0074 | 0.0093 |
| Beryllium, total (T-Be) | mg/L | 0.1 | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Boron, total (T-B) | mg/L | 1.2 | - | 1.17 | ***2.84*** | ***3.34*** | ***1.40*** | ***2.17*** | ***3.58*** |
| Cadmium, total (T-Cd) | mg/L | 0.00012 | - | 0.000032 | 0.00005 | 0.000046 | 0.000025 | 0.000039 | 0.00007 |
| Chromium, total (T-Cr) | mg/L | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Cobalt, total (T-Co) | mg/L | - | - | 0.000136 | 0.000064 | 0.000063 | 0.000082 | 0.000073 | 0.000059 |
| Copper, total (T-Cu) | mg/L | 0.002 | 0.003 | ***0.00744*** | <0.0005 | <0.0005 | 0.00073 | 0.00063 | <0.0005 |
| Iron, total (T-Fe) | mg/L | - | - | 0.137 | 0.058 | 0.029 | 0.118 | 0.083 | 0.028 |
| Lead, total (T-Pb) | mg/L | 0.002 | 0.14 | ***0.00201*** | 0.00012 | <0.0001 | <0.0001 | <0.0001 | <0.0001 |
| Manganese, total (T-Mn) | mg/L | - | - | 0.00746 | 0.00367 | 0.00239 | 0.00688 | 0.00558 | 0.00229 |
| Mercury, total (T-Hg) [6] | mg/L | 0.000016 | - | <0.000005 | <0.000005 | <0.000005 | <0.000005 | <0.000005 | <0.000005 |
| Molybdenum, total (T-Mo) | mg/L | - | - | 0.00347 | 0.00672 | 0.00803 | 0.00372 | 0.00533 | 0.00839 |
| Nickel, total (T-Ni) | mg/L | 0.0083 | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Selenium, total (T-Se) | mg/L | 0.002 | - | <0.0005 | 0.00084 | <0.0005 | <0.0005 | <0.0005 | 0.00051 |
| Silver, total (T-Ag) | mg/L | 0.0015 | 0.003 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 |
| Thallium, total (T-Tl) | mg/L | - | - | <0.00005 | <0.00005 | <0.00005 | <0.00005 | <0.00005 | <0.00005 |
| Uranium, total (T-U) | mg/L | - | - | 0.000932 | 0.00192 | 0.00231 | 0.000981 | 0.0015 | 0.00234 |
| Vanadium, total (T-V) | mg/L | 0.005 [7] | - | 0.00093 | 0.0011 | 0.00123 | 0.00092 | 0.00101 | 0.00131 |
| Zinc, total (T-Zn) | mg/L | 0.01 | 0.055 | ***0.0176*** | <0.003 | <0.003 | <0.003 | <0.003 | <0.003 |
| Hexavalent Chromium, total | mg/L | 0.0015 | - | <0.0015 | <0.0015 | <0.0015 | <0.0015 | <0.0015 | <0.0015 |
| **Dissolved Metals** | | | | | | | | | |
| Cadmium, dissolved (D-Cd) | mg/L | - | - | 0.000025 | 0.00004 | 0.00005 | 0.000027 | 0.000036 | 0.000061 |
| Copper, dissolved (D-Cu) | mg/L | - | - | 0.00106 | <0.0005 | 0.00053 | 0.00056 | 0.00056 | <0.0005 |
| Iron, dissolved (D-Fe) | mg/L | - | - | 0.019 | <0.01 | <0.01 | 0.019 | 0.014 | <0.01 |
| Lead, dissolved (D-Pb) | mg/L | - | - | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 |
| Manganese, dissolved (D-Mn) | mg/L | - | - | 0.00553 | 0.0029 | 0.00208 | 0.00557 | 0.00437 | 0.00166 |
| Strontium, dissolved (D-Sr) | mg/L | - | - | 2.07 | 4.32 | 5.4 | 2.22 | 3.22 | 5.4 |
| Vanadium, dissolved (D-V) | mg/L | - | - | 0.00066 | 0.00096 | 0.00116 | 0.00067 | 0.00083 | 0.00122 |
| Zinc, dissolved (D-Zn) | mg/L | - | - | 0.0052 | 0.0011 | 0.0016 | 0.0013 | 0.0032 | 0.0014 |
| **Polycyclic Aromatic Hydrocarbons (PAHs)** | | | | | | | | | |
| Acenaphthene | mg/L | 0.006 | - | - | - | - | - | - | - |
| Acridine | mg/L | - | - | - | - | - | - | - | - |
| Anthracene | mg/L | - | - | - | - | - | - | - | - |
| Benz(a)anthracene | mg/L | - | - | - | - | - | - | - | - |
| Benzo(a)pyrene | mg/L | 0.00001 | - | - | - | - | - | - | - |
| Chrysene | mg/L | 0.0001 | - | - | - | - | - | - | - |
| Fluoranthene | mg/L | - | - | - | - | - | - | - | - |
| Fluorene | mg/L | 0.012 | - | - | - | - | - | - | - |
| 1-methylnaphthalene | mg/L | 0.001 | - | - | - | - | - | - | - |
| 2-methylnaphthalene | mg/L | 0.001 | - | - | - | - | - | - | - |
| Naphthalene | mg/L | 0.001 | - | - | - | - | - | - | - |
| Phenanthrene | mg/L | - | - | - | - | - | - | - | - |
| Pyrene | mg/L | - | - | - | - | - | - | - | - |
| Quinoline | mg/L | - | - | - | - | - | - | - | - |
| **Volatile Organic Compounds (VOCs)** | | | | | | | | | |
| Benzene | mg/L | 0.11 | - | - | - | - | - | - | - |
| Ethylbenzene | mg/L | 0.25 | - | - | - | - | - | - | - |
| Methyl-tert-butyl-ether | mg/L | 5 | 0.44 | - | - | - | - | - | - |
| Styrene | mg/L | - | - | - | - | - | - | - | - |
| Toluene | mg/L | 0.215 | - | - | - | - | - | - | - |
| Total Xylenes | mg/L | - | - | - | - | - | - | - | - |
| Chlorobenzene | mg/L | 0.025 | - | - | - | - | - | - | - |
| 1,2-Dichlorobenzene | mg/L | 0.042 | - | - | - | - | - | - | - |

**Notes:**
Results ***underlined in bold italics*** exceed the applicable long-term water quality guideline for the protection of marine water aquatic life.
Shaded results exceed the applicable short-term water quality guideline for the protection of marine water aquatic life.
[1] Approved British Columbia Water Quality Guidelines for the protection of marine aquatic life (BC ENV, 2021). Where an approved guideline is not established, the working guideline is applied.
[2] Canadian Water Quality Guideline for the protection of marine aquatic life (CCME, 2021).
[3] Narrative guideline for the evaluation of change from background conditions arising from discharges to the aquatic environment. The water quality data presented in the table were collected when the site was discharging, therefore the guidelines were evaluated.
[4] The approved total ammonia nitrogen BC WQG is salinity, pH and temperature dependent; see Tables 26E and 26F in BC WQG guidance document (BC ENV, 2021).
[5] The working BC WQG for trivalent antimony [SB(III)] is 0.27 mg/L and is applied to total antimony results.
[6] When MeHg ⩽ 0.5% of total Hg, BC WQG = 0.00002 mg/L.
[7] Federal Water Quality Guideline for Vanadium (Environment and Climate Change Canada).
The lowest applicable guidelines are shown in the table; however, water quality data was screened to all applicable guidelines.

## Table D-2: Summary of Marine Water Quality Results Received at the Time of Reporting

| Parameter | Unit | Lowest Applicable Guideline [1, 2] | | Reference Station WQR1 | | | Station IDZ-E1 | Station IDZ-E2 |
|---|---|---|---|---|---|---|---|---|
| | | | | 0.5 m Below Surface | 2 m Below Surface | 2 m Above Seafloor | 0.5 m Below Surface | 0.5 m Below Surface |
| | | | | WQR1 0.5 | WQR1 2m | WQR1 SF | IDZ-E1-0.5 | IDZ-E2-0.5 |
| | | | | VA24A9802-011 | VA24A9802-012 | VA24A9802-013 | VA24B0013-001 | VA24B0013-002 |
| | | Long Term | Short Term | 2024-05-05 16:33 | 2024-05-05 16:44 | 2024-05-05 16:54 | 2024-05-07 13:58 | 2024-05-07 14:17 |
| **General Parameters** | | | | | | | | |
| pH - Field | pH units | 7.0 - 8.7 | - | - | - | - | - | - |
| Conductivity - Field | µS/cm | - | - | - | - | - | - | - |
| Temperature - Field | °C | - | - | - | - | - | - | - |
| Salinity - Field | ppt | Narrative [3] | - | - | - | - | - | - |
| Turbidity - Field | NTU | Narrative [3] | Narrative [3] | - | - | - | - | - |
| TSS | mg/L | Narrative [3] | Narrative [3] | <2 | <2 | <2 | 2.7 | 2.2 |
| Dissolved Oxygen - Field | mg/L | >=8 | - | - | - | - | - | - |
| **Anions and Nutrients** | | | | | | | | |
| Sulphate | mg/L | - | - | - | - | - | - | - |
| Chloride | mg/L | - | - | - | - | - | - | - |
| Fluoride | mg/L | - | 1.5 | - | - | - | - | - |
| Ammonia ($N\text{-}NH_3$) | mg/L | Variable [4] | Variable [4] | - | - | - | - | - |
| Nitrite ($N\text{-}NO_2$) | mg/L | - | - | - | - | - | - | - |
| Nitrate ($N\text{-}NO_3$) | mg/L | 3.7 | 339 | - | - | - | - | - |
| **Total Metals** | | | | | | | | |
| Aluminum, total (T-Al) | mg/L | - | - | 0.067 | 0.022 | 0.0073 | 0.166 | 0.143 |
| Antimony, total (T-Sb) | mg/L | - | 0.27 [5] | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| Arsenic, total (T-As) | mg/L | 0.0125 | 0.0125 | 0.00084 | 0.00193 | 0.00236 | 0.00116 | 0.00132 |
| Barium, total (T-Ba) | mg/L | - | - | 0.0076 | 0.0057 | 0.0079 | 0.0087 | 0.0081 |
| Beryllium, total (T-Be) | mg/L | 0.1 | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Boron, total (T-B) | mg/L | 1.2 | - | ***1.37*** | ***3.11*** | ***3.98*** | 1.19 | ***1.40*** |
| Cadmium, total (T-Cd) | mg/L | 0.00012 | - | 0.000026 | 0.00005 | 0.00006 | 0.000024 | 0.000021 |
| Chromium, total (T-Cr) | mg/L | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Cobalt, total (T-Co) | mg/L | - | - | 0.00008 | 0.000065 | 0.000057 | 0.000124 | 0.000113 |
| Copper, total (T-Cu) | mg/L | 0.002 | 0.003 | 0.00071 | <0.0005 | <0.0005 | 0.0011 | 0.00099 |
| Iron, total (T-Fe) | mg/L | - | - | 0.115 | 0.032 | 0.012 | 0.2 | 0.164 |
| Lead, total (T-Pb) | mg/L | 0.002 | 0.14 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 |
| Manganese, total (T-Mn) | mg/L | - | - | 0.00719 | 0.00302 | 0.00118 | 0.00924 | 0.00819 |
| Mercury, total (T-Hg) [6] | mg/L | 0.000016 | - | <0.000005 | <0.000005 | <0.000005 | <0.000005 | <0.000005 |
| Molybdenum, total (T-Mo) | mg/L | - | - | 0.00368 | 0.00723 | 0.00914 | 0.0035 | 0.00368 |
| Nickel, total (T-Ni) | mg/L | 0.0083 | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Selenium, total (T-Se) | mg/L | 0.002 | - | <0.0005 | 0.00056 | 0.0008 | <0.0005 | <0.0005 |
| Silver, total (T-Ag) | mg/L | 0.0015 | 0.003 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 |
| Thallium, total (T-Tl) | mg/L | - | - | <0.00005 | <0.00005 | <0.00005 | <0.00005 | <0.00005 |
| Uranium, total (T-U) | mg/L | - | - | 0.000963 | 0.0021 | 0.0026 | 0.000928 | 0.00101 |
| Vanadium, total (T-V) | mg/L | 0.005 [7] | - | 0.00089 | 0.0011 | 0.00129 | 0.00111 | 0.00104 |
| Zinc, total (T-Zn) | mg/L | 0.01 | 0.055 | <0.003 | <0.003 | <0.003 | <0.003 | <0.003 |
| Hexavalent Chromium, total | mg/L | 0.0015 | - | <0.0015 | <0.0015 | <0.0015 | <0.0015 | <0.0015 |
| **Dissolved Metals** | | | | | | | | |
| Cadmium, dissolved (D-Cd) | mg/L | - | - | 0.000022 | 0.000049 | 0.000072 | <0.00002 | 0.000021 |
| Copper, dissolved (D-Cu) | mg/L | - | - | 0.0006 | <0.0005 | <0.0005 | 0.00065 | 0.00066 |
| Iron, dissolved (D-Fe) | mg/L | - | - | 0.017 | <0.01 | <0.01 | 0.01 | <0.01 |
| Lead, dissolved (D-Pb) | mg/L | - | - | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 |
| Manganese, dissolved (D-Mn) | mg/L | - | - | 0.00566 | 0.00253 | 0.00095 | 0.00549 | 0.00515 |
| Strontium, dissolved (D-Sr) | mg/L | - | - | 2.09 | 4.71 | 6.06 | 2.07 | 2.31 |
| Vanadium, dissolved (D-V) | mg/L | - | - | 0.00061 | 0.00102 | 0.00125 | 0.00063 | 0.00064 |
| Zinc, dissolved (D-Zn) | mg/L | - | - | 0.002 | <0.001 | 0.0017 | 0.0031 | <0.001 |
| **Polycyclic Aromatic Hydrocarbons (PAHs)** | | | | | | | | |
| Acenaphthene | mg/L | 0.006 | - | - | - | - | - | - |
| Acridine | mg/L | - | - | - | - | - | - | - |
| Anthracene | mg/L | - | - | - | - | - | - | - |
| Benz(a)anthracene | mg/L | - | - | - | - | - | - | - |
| Benzo(a)pyrene | mg/L | 0.00001 | - | - | - | - | - | - |
| Chrysene | mg/L | 0.0001 | - | - | - | - | - | - |
| Fluoranthene | mg/L | - | - | - | - | - | - | - |
| Fluorene | mg/L | 0.012 | - | - | - | - | - | - |
| 1-methylnaphthalene | mg/L | 0.001 | - | - | - | - | - | - |
| 2-methylnaphthalene | mg/L | 0.001 | - | - | - | - | - | - |
| Naphthalene | mg/L | 0.001 | - | - | - | - | - | - |
| Phenanthrene | mg/L | - | - | - | - | - | - | - |
| Pyrene | mg/L | - | - | - | - | - | - | - |
| Quinoline | mg/L | - | - | - | - | - | - | - |
| **Volatile Organic Compounds (VOCs)** | | | | | | | | |
| Benzene | mg/L | 0.11 | - | - | - | - | - | - |
| Ethylbenzene | mg/L | 0.25 | - | - | - | - | - | - |
| Methyl-tert-butyl-ether | mg/L | 5 | 0.44 | - | - | - | - | - |
| Styrene | mg/L | - | - | - | - | - | - | - |
| Toluene | mg/L | 0.215 | - | - | - | - | - | - |
| Total Xylenes | mg/L | - | - | - | - | - | - | - |
| Chlorobenzene | mg/L | 0.025 | - | - | - | - | - | - |
| 1,2-Dichlorobenzene | mg/L | 0.042 | - | - | - | - | - | - |

**Notes:**
Results ***underlined in bold italics*** exceed the applicable long-term water quality guideline for the protection of marine water aquatic life.
Shaded results exceed the applicable short-term water quality guideline for the protection of marine water aquatic life.
[1] Approved British Columbia Water Quality Guidelines for the protection of marine aquatic life (BC ENV, 2021). Where an approved guideline is not established, the working guideline is applied.
[2] Canadian Water Quality Guideline for the protection of marine aquatic life (CCME, 2021).
[3] Narrative guideline for the evaluation of change from background conditions arising from discharges to the aquatic environment. The water quality data presented in the table were collected when the site was discharging, therefore the guidelines were evaluated.
[4] The approved total ammonia nitrogen BC WQG is salinity, pH and temperature dependent; see Tables 26E and 26F in BC WQG guidance document (BC ENV, 2021).
[5] The working BC WQG for trivalent antimony [SB(III)] is 0.27 mg/L and is applied to total antimony results.
[6] When MeHg ⩽ 0.5% of total Hg, BC WQG = 0.00002 mg/L.
[7] Federal Water Quality Guideline for Vanadium (Environment and Climate Change Canada).
The lowest applicable guidelines are shown in the table; however, water quality data was screened to all applicable guidelines.