# TECHNICAL MEMORANDUM

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| **To:** | **Ian McAllister, Ashleigh Crompton, Mike Champion, Jackie Boruch and Ryan Schucroft (Woodfibre LNG)** | **Date:** | **20 Sept 2024** |
| **From:** | **Cheng Kuang, Holly Pelletier and Patrick Mueller (Lorax)** | **Project #:** | **A633-8** |
| **Subject:** | **PE-111578 Weekly Discharge and Compliance Report #31 for September 8 – 14** | | |

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 for contact water discharges 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 #31) was prepared by Lorax Environmental and summarizes monitoring conducted the week of (September 8 – 14) for contact waters directed to a Wastewater Treatment Plant (WWTP) or a sedimentation pond. Monitoring data and pending results from prior monitoring periods available at the time of reporting are tabulated and included as appendices to this memorandum. Report #31 has been prepared to meet the 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."

The site layout is shown in Figure 1 at the end of this memorandum. Sedimentation pond photographs are included in Appendix A, and monitoring results are tabulated in Appendix B through Appendix F for contact water and receiving environment samples.

# 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, overburden and bedrock excavation, and construction of contact water management facilities. Shoring works along the shoreline and foreshore areas were initiated in December 2023, and in early 2024 construction of water management infrastructure commenced and has continued through the September 8 – 14 monitoring period. The East WWTP and East Sedimentation Pond are commissioned for operation and discharge since April 15, 2024. The West WWTP and West Sedimentation Pond are constructed. The non-contact and contact water conveyance ditches described in PE-111578 are partially constructed or will be constructed when site preparation activities are completed (*e.g.*, site grading, bedrock excavation). The PE-111578 water management facilities that are completed or were under construction during the reporting period are shown in Figure 1. Established contact water collection and dewatering locations and photographs of the sedimentation ponds are shown in Appendix A, Figure 2 through Figure 5.

The non-contact water diversion ditch west of Mill Creek was upgraded and commissioned for use on April 7 and discharges to Mill Creek at station OUT-06 (Figure 1). Other pre-existing diversion ditches west of Mill Creek have been partially upgraded and discharge at station OUT-02. During heavy precipitation these ditches also convey non-contact water to station OUT-01. Temporary diversion of East Creek through OUT-11 occurred on September 17.

The East and West catchments conveyance ditches described in PE-111578 were designed to transport non-contaminated contact water to the East and West sedimentation ponds and 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 and contaminated contact waters within the catchments are managed to remain on site using a system of sumps and baker tanks for intermediate storage and are then directed to the East WWTP for treatment. During periods of heavy precipitation, non-contaminated contact water may also be directed to the East or West Sedimentation Ponds for settling of TSS prior to discharge (East Pond) or for storage (West Pond).

A revised schedule is being developed to complete the installation of the East and West Sedimentation Pond permanent outfall structures. A temporary discharge system (*i.e.*, pump, hosing and diffusor) is used 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. The West Sedimentation Pond is not commissioned for discharge. Surplus water in the West Sedimentation Pond is pumped to the East WWTP for treatment prior to discharge through the East Sedimentation Pond.

Pilot testing of the East WWTP continued during the monitoring period (September 8 – 14). Contaminated and potentially contaminated contact waters from the 1100, 1300 and 4100 areas were directed to the East WWTP for treatment, as well as water recirculated from the East Sedimentation Pond (Appendix A, Figure 2 and Figure 3). A total of 3,897 $m^3$ of treated WWTP effluent was discharged to the East Sedimentation Pond during the reporting period (September 8 – 14). Daily East WWTP effluent flows are provided in Appendix C (Table C-2). The East Sedimentation Pond intermittently discharged on September 8, 9, and 10 by pumping effluent to the discharge location SP-E-OUT. A total of 2,226 $m^3$ of effluent was discharged to Howe Sound during the reporting period.

The West WWTP is undergoing pilot trials. During the monitoring period (September 8 – 14), the West WWTP received water from the West Sedimentation Pond each day except September 10 since the plant was not operational that day. A total of 161 $m^3$ of treated WWTP effluent was discharged to the West Sedimentation Pond as part of pilot testing. Daily West WWTP effluent flows are provided in Appendix D (Table D-2). The West Sedimentation Pond is complete, except for the outfall structure, and has not been commissioned for discharge. There were no discharges from the West Sedimentation Pond to Howe Sound during the monitoring period.

The weather was variable during the monitoring period (September 8 – 14), with precipitation recorded at the Woodfibre site weather station on September 10, 11, 13, and 14. The total weekly precipitation amount was 23.6 mm. The daily weather conditions are summarized in Table 1.

**Table 1: Summary of Certified Project Area (CPA) Daily Weather Conditions.**

| Date | Precipitation (mm) | Max. Temp (°C) | Min. Temp (°C) | Weather Description |
|---|---|---|---|---|
| 09-08-2024 | 0 | 22.4 | 15.8 | Sun |
| 09-09-2024 | 0 | 22.2 | 14.9 | Sun |
| 09-10-2024 | 0.2 | 21.8 | 13.2 | Rain shower, Sun |
| 09-11-2024 | 1.4 | 18.2 | 13.4 | Overcast, Light rain |
| 09-12-2024 | 0 | 21.5 | 13.7 | Sun |
| 09-13-2024 | 11.2 | 17.6 | 12.8 | Rain |
| 09-14-2024 | 10.8 | 17.8 | 11.8 | Rain |

Note: Data retrieved from the Stantec Woodfibre site weather station.

## 2. Monitoring Summary

The PE-111578 authorized works were under construction during the September 8 – 14 monitoring period. Compliance monitoring stations are progressively established 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 initial dilution zone (IDZ) locations (WQR1, WQR2, IDZ-E1 and IDZ-E2).
- Non-contact diversion ditch outlets (OUT-01, OUT-02, OUT-06, and OUT-11). East Creek water was temporarily diverted to OUT-11 on September 17.
- Contact water monitoring locations (WWTP-E-IN, WWTP-E-OUT, SP-E-IN-2, SP-E-OUT, SP-E-NE, SP-E-NW, WWTP-W-IN, WWTP-W-OUT, SP-W-W, and SP-W-E).

East Sedimentation Pond influent and effluent stations SP-E-NW and SP-E-NE, respectively, are in-pond stations that may be monitored in place of stations SP-E-IN-2 and SP-E-OUT when there is no influent to, or discharge from the East Sedimentation Pond. In-pond monitoring stations have been established for the West Sedimentation Pond at locations SP-W-W and SP-W-E and are used for pond water quality monitoring during the West WWTP pilot trials.

Water quality was monitored at stations IDZ-E1, IDZ-E2, WWTP-E-IN, WWTP-E-OUT, SP-E-NE, SP-E-NW, WWTP-W-IN, and WWTP-W-OUT during the monitoring period (September 8 – 14). Sampling dates and parameters tested are summarized in Table 2. Daily field parameters and a weekly analytical sample were not collected at influent station SP-E-IN-2 as the East Sedimentation Pond did not receive contact water inflows during the monitoring period. Daily field parameters and an analytical sample were collected at effluent station SP-E-OUT as the East Sedimentation Pond discharged on September 8, 9, and 10.

Overall, the PE-111578 monitoring requirements that were applicable during the monitoring period (September 8 – 14) were met. Field measurements were collected each day at both WWTP-E-IN and WWTP-E-OUT except on September 9 as the East WWTP was not discharging at the time of monitoring. Daily field measurements were collected at both WWTP-W-IN and WWTP-W-OUT except on September 10 and 12 as the West WWTP was not discharging at the time of monitoring.

**Table 2: Summary of PE-111578 Monitoring Samples Collected September 8 – 14.**

| Sampling Date | Sample | Description | Parameters Tested | Monitoring Frequency |
|---|---|---|---|---|
| September 8, 2024 | SP-E-OUT | East Sedimentation Pond effluent | Field, Physical & General Parameters, VH & BTEX, EPHs & PAHs, Total, Dissolved and Speciated Metals, VOCs, Methylmercury, Dioxins & Furans, Glycols, Oil and Grease. | D, $W_1$, $W_2$ |
| | SP-E-NE [1] | East Sedimentation Pond, in-pond sample, represents effluent quality | Field Parameters. | P |
| | WWTP-E-OUT | East WWTP effluent | Field, Physical & General Parameters, VH & BTEX, EPHs & PAHs, Total, Dissolved and Speciated Metals, VOCs, Methylmercury, Dioxins & Furans, Glycols, Oil and Grease. | D, $W_1$, $W_2$ |
| | WWTP-E-IN | East WWTP influent | | |
| | WWTP-W-OUT | West WWTP effluent | Field Parameters. | D |
| | WWTP-W-IN | West WWTP influent | | |
| September 9, 2024 | SP-E-OUT | East Sedimentation Pond effluent | Field Parameters. | D |
| | SP-E-NE [1] | East Sedimentation Pond, in-pond sample, represents effluent quality | Field Parameters. | P |
| | WWTP-W-OUT | West WWTP effluent | Field Parameters. | D |
| | WWTP-W-IN | West WWTP influent | | |
| | IDZ-E1-0.5 | Howe Sound IDZ station E1; 0.5 m below surface | Field, Physical & General Parameters, EPHs & PAHs, Total, Dissolved and Speciated Metals. | $W_3$, P |
| | IDZ-E1-2m | Howe Sound IDZ station E1; 2 m below surface | | |
| | IDZ-E1-SF | Howe Sound IDZ station E1; 2 m above the seafloor | | |
| September 10, 2024 | SP-E-OUT | East Sedimentation Pond effluent | Field Parameters. | D |
| | SP-E-NE [1] | East Sedimentation Pond, in-pond sample, represents effluent quality | Field Parameters. | P |
| | WWTP-E-OUT | East WWTP effluent | Field Parameters. | D |
| | WWTP-E-IN | East WWTP influent | | |
| | IDZ-E2-0.5 | Howe Sound IDZ station E2; 0.5 m below surface | Field, Physical & General Parameters, EPHs & PAHs, Total, Dissolved and Speciated Metals. | $W_3$, P |
| | IDZ-E2-2m | Howe Sound IDZ station E2; 2 m below surface | | |
| | IDZ-E2-SF | Howe Sound IDZ station E2; 2 m above the seafloor | | |
| September 11, 2024 | SP-E-NE [1] | East Sedimentation Pond, in-pond sample, represents effluent quality | Field Parameters. | P |
| | WWTP-E-OUT | East WWTP effluent | Field, Physical & General Parameters, VH & BTEX, EPHs & PAHs, Total, Dissolved and Speciated Metals, VOCs, Methylmercury, Dioxins & Furans, Glycols, Oil and Grease. | D, $W_1$, $W_2$ |
| | WWTP-E-IN | East WWTP influent | | |
| | WWTP-W-OUT | West WWTP effluent | Field, Physical & General Parameters, VH & BTEX, EPHs & PAHs, Total, Dissolved and Speciated Metals, VOCs, Methylmercury, Dioxins & Furans, Glycols, Oil and Grease. | D, $W_1$, $W_2$ |
| | WWTP-W-IN | West WWTP influent | | |
| September 12, 2024 | SP-E-NE [1] | East Sedimentation Pond, in-pond sample, represents effluent quality | Field & Physical Parameters, EPHs & PAHs, Total, Dissolved and Speciated Metals. | P |
| | SP-E-NW [1] | East Sedimentation Pond, in-pond sample, represents influent quality | | |
| | WWTP-E-OUT | East WWTP effluent | Field Parameters. | D |
| | WWTP-E-IN | East WWTP influent | | |
| September 13, 2024 | SP-E-NE [1] | East Sedimentation Pond, in-pond sample, represents effluent quality | Field Parameters. | P |
| | SP-E-NW [1] | East Sedimentation Pond, in-pond sample, represents influent quality | | |
| | WWTP-E-OUT | East WWTP effluent | Field Parameters. | D |
| | WWTP-E-IN | East WWTP influent | | |
| | WWTP-W-OUT | West WWTP effluent | Field, Physical & General Parameters, VH & BTEX, EPHs & PAHs, Total, Dissolved and Speciated Metals, VOCs, Methylmercury, Dioxins & Furans, Glycols, Oil and Grease. | D, $W_1$, $W_2$ |
| | WWTP-W-IN | West WWTP influent | | |
| September 14, 2024 | SP-E-NE [1] | East Sedimentation Pond, in-pond sample, represents effluent quality | Field & Physical Parameters, EPHs & PAHs, Total, Dissolved and Speciated Metals. | P |
| | SP-E-NW [1] | East Sedimentation Pond, in-pond sample, represents influent quality | | |
| | WWTP-E-OUT | East WWTP effluent | Field & Physical Parameters, EPHs & PAHs, Total, Dissolved and Speciated Metals. | D, $W_1$ |
| | WWTP-E-IN | East WWTP influent | | |
| | WWTP-W-OUT | West WWTP effluent | Field Parameters. | D |
| | WWTP-W-IN | West WWTP influent | | |

**Notes:**
Monitoring frequency requirements under PE-111578 are indicated as follows:
D – daily monitoring of field parameters at WWTP and sedimentation pond influent and effluent stations.
M – Monthly monitoring for all parameters at WWTP, sedimentation pond and receiving environment stations.
$W_1$ – initial high frequency monitoring for physical parameters at WWTP and sedimentation pond influent and effluent stations (weekly for the first 6 months of monitoring).
$W_2$ - initial high frequency monitoring for all parameters at WWTP and sedimentation pond influent and effluent stations (weekly for the first 5 weeks of monitoring).
$W_3$ – initial high frequency monitoring for physical parameters at IDZ stations (weekly for the first 5 weeks of monitoring).
P - periodic monitoring for targeted parameters that is supplementary to PE-111578 requirements.
[1] In-Pond stations SP-E-NW and SP-E-NE may be monitored in place of stations SP-E-IN-2 and SP-E-OUT, respectively, when there is no influent to, or discharge from the East Sedimentation Pond at the time of monitoring. Similarly, the West Sedimentation Pond in-pond stations, SP-W-W and SP-W-E are monitored for water management purposes. The monitoring of in-pond stations is not a PE-111578 requirement and is conducted at the discretion of field staff.

# 3. Water Quality Results

## 3.1 Screening and Reporting Overview

Water quality and flow monitoring results are screened against field quality control (QC) criteria, benchmark values, operational minimum discharge objectives (MDOs) that the WWTPs are currently being operated to meet, PE-111578 discharge limits, as well as Canadian, Federal and BC water quality guidelines (WQGs). The screening results are discussed in Section 3. All water quality data are stored in the Woodfibre LNG environmental monitoring database. However, for brevity, a sub-set of the results are presented in the weekly report appendices. Results are reported for parameters with a freshwater, estuarine or marine water quality guideline for the protection of aquatic life, parameters with a discharge limit, parameters of potential concern (*i.e.*, dioxins and furans) as well as other parameters that are relevant for water quality interpretation.

Canadian, Federal and BC WQGs are not specified for dioxins and furans. The general term "dioxins and furans" refers to chlorinated dibenzo-*p*-dioxins and chlorinated dibenzofurans. A sub-set of 17 polychlorinated dibenzo-*p*-dioxins (PCDDs) and polychlorinated dibenzofurans (PCDFs) are typically evaluated for toxicity and the individual parameter concentrations are converted to toxic equivalent (TEQ) values that are summed and reported as a single PCDD/F TEQ parameter. To address uncertainties for results reported as not detected, two PCDD/F TEQ values are reported. A "lower-bound PCDD/F TEQ" is calculated assuming a concentration of zero for results reported as not detected, therefore, if all 17 of the individual compounds in the sub-set are not detected the lower-bound PCDD/F TEQ will equal zero. An "upper-bound PCDD/F TEQ" is calculated assuming a concentration equal to the detection limit for results reported as not detected. These two parameters span the range of possible TEQs if one or more of the sub-set of 17 individual PCDDs and PCDFs are not detected.

## 3.2 Summary of Reported Results

Field measurements and analytical results available at the time of reporting for samples collected during the monitoring period (September 8 – 14) and for other samples that have not been previously reported are listed below in Table 3. Analytical results not available at the time of reporting will be included in future weekly reports when testing is completed. Testing for methylmercury, dioxins and furans typically requires up to four weeks to complete. Results are pending for the following samples and parameters:

- IDZ-E1 and IDZ-E2 collected August 23 (methylmercury, dioxins and furans)
- WQR1 and WQR2 collected August 26 (methylmercury, dioxins and furans)

- SP-E-OUT, WWTP-E-IN and WWTP-E-OUT collected September 8 (methylmercury, dioxins and furans)
- WWTP-E-IN, WWTP-E-OUT, WWTP-W-IN and WWTP-W-OUT collected September 11 (methylmercury, dioxins and furans)
- WWTP-W-IN and WWTP-W-OUT collected September 13 (methylmercury, dioxins and furans)

## Table 3: Summary of Analytical Results Included in Weekly Discharge and Compliance Report #31.

| Sample | Description | Sampling Date | Parameters Reported |
|---|---|---|---|
| IDZ-E1-0.5 | Howe Sound IDZ station E1; 0.5 m below surface | August 23, 2024 | Field, Physical and General Parameters, Total and Dissolved Metals, Hexavalent Chromium, PAHs, and VOCs. |
| IDZ-E1-2m | Howe Sound IDZ station E1; 2 m below surface | | |
| IDZ-E1-SF | Howe Sound IDZ station E1; 2 m above the seafloor | | |
| IDZ-E2-0.5 | Howe Sound IDZ station E2; 0.5 m below surface | | |
| IDZ-E2-2m | Howe Sound IDZ station E2; 2 m below surface | | |
| IDZ-E2-SF | Howe Sound IDZ station E2; 2 m above the seafloor | | |
| WQR1-0.5 | Reference site 1; 0.5 m below surface. | August 26, 2024 | Field, Physical and General Parameters, Total and Dissolved Metals, Hexavalent Chromium, PAHs, and VOCs. |
| WQR1-2m | Reference site 1; 2 m below surface. | | |
| WQR1-SF | Reference site 1; 2 m above the seafloor. | | |
| WQR2-0.5 | Reference site 2; 0.5 m below surface. | | |
| WQR2-2m | Reference site 2; 2 m below surface. | | |
| WQR2-SF | Reference site 2; 2 m above the seafloor. | | |
| IDZ-E1-0.5 | Howe Sound IDZ station E1; 0.5 m below surface | September 4, 2024 | Field and Physical Parameters. |
| IDZ-E1-2m | Howe Sound IDZ station E1; 2 m below surface | | |
| IDZ-E1-SF | Howe Sound IDZ station E1; 2 m above the seafloor | | |
| IDZ-E2-0.5 | Howe Sound IDZ station E2; 0.5 m below surface | | |
| IDZ-E2-2m | Howe Sound IDZ station E2; 2 m below surface | | |
| IDZ-E2-SF | Howe Sound IDZ station E2; 2 m above the seafloor | | |
| SP-E-OUT | East Sedimentation Pond effluent | September 8, 2024 | Field, Physical and General Parameters, Total and Dissolved Metals, Hexavalent Chromium, PAHs, and VOCs. |
| WWTP-E-OUT | East WWTP effluent | | |
| WWTP-E-IN | East WWTP influent | | |
| IDZ-E1-0.5 | Howe Sound IDZ station E1; 0.5 m below surface | September 9, 2024 | Field, Physical and General Parameters, Total and Dissolved Metals, Hexavalent Chromium, PAHs. |
| IDZ-E1-2m | Howe Sound IDZ station E1; 2 m below surface | | |
| IDZ-E1-SF | Howe Sound IDZ station E1; 2 m above the seafloor | | |
| IDZ-E2-0.5 | Howe Sound IDZ station E2; 0.5 m below surface | September 10, 2024 | Field, Physical and General Parameters, Total and Dissolved Metals, Hexavalent Chromium, PAHs. |
| IDZ-E2-2m | Howe Sound IDZ station E2; 2 m below surface | | |
| IDZ-E2-SF | Howe Sound IDZ station E2; 2 m above the seafloor | | |
| WWTP-E-OUT | East WWTP effluent | September 11, 2024 | Field, Physical and General Parameters, Total and Dissolved Metals, Hexavalent Chromium, PAHs, and VOCs. |
| WWTP-E-IN | East WWTP influent | | |
| WWTP-W-OUT | West WWTP effluent | | |
| WWTP-W-IN | West WWTP influent | | |
| SP-E-NE | East Sedimentation Pond, in-pond sample, represents effluent quality | September 12, 2024 | Field and Physical Parameters, Total and Dissolved Metals, Hexavalent Chromium, PAHs. |
| SP-E-NW | East Sedimentation Pond, in-pond sample, represents influent quality | | |
| WWTP-W-OUT | West WWTP effluent | September 13, 2024 | Field, Physical and General Parameters, Total and Dissolved Metals, Hexavalent Chromium, PAHs, and VOCs. |
| WWTP-W-IN | West WWTP influent | | |
| SP-E-NE | East Sedimentation Pond, in-pond sample, represents effluent quality | September 14, 2024 | Field and Physical Parameters, Total and Dissolved Metals, Hexavalent Chromium, PAHs. |
| SP-E-NW | East Sedimentation Pond, in-pond sample, represents influent quality | | |
| WWTP-E-OUT | East WWTP effluent | | |
| WWTP-E-IN | East WWTP influent | | |

### 3.3 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 Canadian, Federal and BC 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 below for parameter concentrations that exceeded WQGs and discharge limits in the in-pond effluent quality station (Table 4 and Table 5) and the effluent compliance location (Table 6).

During the monitoring period (September 8 – 14), the East Sedimentation Pond received East WWTP treated effluent each day. The sedimentation pond did not receive contact water during the monitoring period; therefore, field measurements and analytical samples at station SP-E-IN-2 were not collected. The East Sedimentation Pond intermittently discharged on September 8, 9, and 10 by pumping effluent to the discharge location SP-E-OUT. Field measurements were collected at SP-E-OUT on all three days, and an analytical sample was collected on September 8 while the pond was discharging.

Field measurements and analytical results for the September 8 effluent sample met PE-111578 discharge limits and WQGs except for dissolved oxygen (Table 4). Field measurement of dissolved oxygen collected at SP-E-OUT on September 8 (5.96 mg/L) was below the lower limit of the WQG (≥8 mg/L; Table 4). Transect sampling at the edge of the initial dilution zone (IDZ) was conducted during active discharge from the East Sedimentation Pond, which confirmed that dissolved oxygen met WQG within the initial dilution zone as defined in PE-111578.

Field measurements were taken daily at the in-pond effluent quality station (SP-E-NE), and three times at the in-pond influent quality station (SP-E-NW) during the monitoring period (September 8 – 14). Analytical samples were collected at SP-E-NE and SP-E-NW on September 12 and 14.

Field pH ranged from 6.4 to 7.4 at SP-E-NE during the monitoring period (September 8 – 14), while dissolved oxygen ranged from 5.62 to 11.27 mg/L, and turbidity ranged from 3.73 to 20.00 NTU (Appendix B, Table B-2). Dissolved oxygen measured at station SP-E-NE on September 8 (5.62 mg/L), September 13 (7.10 mg/L) and September 14 (7.12 mg/L) was below the lower limit of the WQG (≥8 mg/L; Table 5).

The analytical sample collected on September 12 at SP-E-NE had elevated levels of TSS (42.8 mg/L), total copper (0.00482 mg/L), and total zinc (0.0185 mg/L) compared to their respective discharge limits (Table 6). The elevated level of TSS measured in the sample was inconsistent with field turbidity (7.93 NTU). Laboratory re-analysis has been requested to confirm the result. The pond did not discharge on that day and therefore non-compliant effluent was not discharged

to Howe Sound. Water quality met discharge limits in the SP-E-NE sample collected on September 14.

**Table 4:**
**Summary of WQG Exceedances for the East Sedimentation Pond at the Effluent Compliance Station SP-E-OUT during the Monitoring Period (September 8 – 14)**

| Parameter | Units | WQG | N | N >WQG | Commentary |
|---|---|---|---|---|---|
| Field Dissolved Oxygen | mg/L | ≥8 | 1 | 1 | Field dissolved oxygen measured at SP-E-OUT on September 8 (5.96 mg/L) was below the lower limit of the WQG. A field investigation was conducted on September 10, which confirmed that dissolved oxygen met WQG within the initial dilution zone as defined in PE-111578. |

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

**Table 5:**
**Summary of Parameters Exceeding WQGs at the In-Pond Effluent Quality Station SP-E-NE during the Monitoring Period (September 8 – 14)**

| Parameter | Units | WQG | N | N >WQG | Commentary |
|---|---|---|---|---|---|
| Field Dissolved Oxygen | mg/L | ≥8 | 5 | 3 | Dissolved oxygen measured at station SP-E-NE on September 8 (5.62 mg/L), September 13 (7.10 mg/L) and September 14 (7.12 mg/L) was below the lower limit of the WQG. |

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

**Table 6:**
**Summary of Parameters Exceeding PE-111578 Discharge Limits at the In-Pond Effluent Quality Station SP-E-NE during the Monitoring Period (September 8 – 14)**

| Parameter | Units | PE-111578 Discharge Limit | N | N > Discharge Limit | Commentary |
|---|---|---|---|---|---|
| TSS | mg/L | 25 | 2 | 1 | The analytical sample collected on September 12 at SP-E-NE had elevated levels of TSS (42.8 mg/L), total copper (0.00482 mg/L), and total zinc (0.0185 mg/L) relative to their respective discharge limits. However, the pond did not discharge on that day and therefore non-compliant effluent was not discharged to Howe Sound. |
| Total Copper | mg/L | 0.0043 | 2 | 1 | |
| Total Zinc | mg/L | 0.0133 | 2 | 1 | |

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

### *3.4 East Wastewater Treatment Plant*

The East WWTP influent and effluent results are screened against the operational minimum discharge objectives (MDOs) which the WWTP is currently being operated to meet. For previous reports (up to Report #30) the WWTP results were screened against design MDOs which are the same as the operational MDOs, except for parameters with sedimentation pond discharge limits (pH, TSS, total copper, total lead, total vanadium and total zinc). For these parameters, the design

MDOs are equal to the lowest WQG values for these parameters whereas the operational MDOs are set to the sedimentation pond discharge limits. Therefore, the weekly report screening criteria have been updated to align with the operational MDOs.

Contaminated contact water is directed to the WWTP influent, and it is expected that influent water is unlikely to meet the operational MDOs. The analytical results, daily field measurements, and the operational MDOs are summarized in Table C-1 (analytical results) and Table C-2 (field measurements) of Appendix C. Screening results are summarized in Table 7 for parameter concentrations that do not meet the operational MDOs in WWTP effluent.

The East WWTP received contact water as well as recirculated water from the East Sedimentation Pond each day during the monitoring period. The influent waters were treated by the East WWTP and discharged to the East Sedimentation Pond. Field measurements were collected each day at the influent (WWTP-E-IN) and effluent (WWTP-E-OUT) stations except on September 9 (Section 2).

Field pH ranged from 6.8 to 7.2 at WWTP-E-IN during the monitoring period (September 8 – 14), while dissolved oxygen ranged from 6.05 to 6.81 mg/L, and turbidity ranged from 3.04 to 23.1 NTU (Appendix C, Table C-2). Field pH, dissolved oxygen, and turbidity in the East WWTP effluent (WWTP-E-OUT) ranged from pH 6.3 to 6.6, 4.60 to 8.31 mg/L, and 3.49 to 6.12 NTU, respectively.

Analytical samples collected from the East WWTP influent and effluent stations on September 8, 11, and 14 were available at the time of reporting. Effluent quality monitored at WWTP-E-OUT achieved operational MDOs for all parameters except for total zinc in the September 8 sample (Table 7).

**Table 7:**
**Summary of Parameters Outside Operational Minimum Discharge Objectives (MDOs) at East WWTP Effluent Station WWTP-E-OUT during September 8 – 14.**

| Parameter | Units | MDO | N | N >MDO | Commentary |
|---|---|---|---|---|---|
| Total Zinc | mg/L | 0.0133 | 3 | 2 | Total zinc concentrations in the September 8 (0.144 mg/L) and September 11 (0.019 mg/L) effluent samples were 11 times and 1.4 times the operational MDO, respectively. |

MDO = minimum discharge objectives (MDOs) for WWTP effluent that are listed in Appendix B of the Construction Wastewater Treatment Plant Operations Environmental Protection Plan dated February 7, 2024.
N = number of samples.
Non-detect results are screened using the detection limit value.

## *3.5 West Sedimentation Pond*

Water quality results were not available for the West Sedimentation Pond at the time of reporting.

### 3.6 West Wastewater Treatment Plant

The West WWTP influent and effluent results screened against the operational MDOs which the WWTP is currently being operated to meet. For previous reports (up to Report #30) the WWTP results were screened against design MDOs which are the same as the operational MDOs, except for parameters with sedimentation pond discharge limits (pH, TSS, total copper, total lead, total vanadium and total zinc). For these parameters, the design MDOs are equal to the lowest WQG values for these parameters whereas the operational MDOs are set to the sedimentation pond discharge limits. Therefore, the weekly report screening criteria have been updated to align with the operational MDOs.

Contaminated contact water is directed to the WWTP influent, and it is expected that influent water is unlikely to meet the operational MDOs. The analytical results and the operational MDOs for the West WWTP pilot testing are summarized in Table D-1 (analytical results) and Table D-2 (field measurements) of Appendix D. Screening results are summarized in Table 8 for parameter concentrations that do not meet the operational MDOs.

The West WWTP received recirculated water from the West Sedimentation Pond each day during the monitoring period (September 8 – 14) except September 10 as the plant was not operational. Field measurements were collected each day at the influent (WWTP-W-IN) and effluent (WWTP-W-OUT) stations except on September 10 and 12 (Section 2).

Field pH ranged from 6.7 to 7.6 at WWTP-W-IN, while dissolved oxygen ranged from 6.92 to 10.23 mg/L, and turbidity ranged from 8.2 to 18.0 NTU (Appendix D, Table D-2). Field pH, dissolved oxygen, and turbidity in the West WWTP effluent (WWTP-W-OUT) ranged from pH 6.2 to 7.8, 2.77 to 8.98 mg/L, and 4.01 to 7.48 NTU, respectively.

Analytical samples collected from the West WWTP influent and effluent stations on September 11 and 13 were available at the time of reporting. West WWTP effluent quality monitored at WWTP-W-OUT achieved operational MDOs for all parameters except for total zinc (Table 8). The West WWTP is undergoing early-stage pilot trials.

**Table 8:**
**Summary of Parameters Outside Operational Minimum Discharge Objectives (MDOs) at West WWTP Effluent Station WWTP-W-OUT.**

| Parameter | Units | MDO | N | N >MDO | Commentary |
|---|---|---|---|---|---|
| Total Zinc | mg/L | 0.0133 | 2 | 2 | Total zinc concentrations in the September 11 (0.0648 mg/L) and September 13 (0.0227 mg/L) effluent samples were 4.9 times and 1.7 times the operational MDO, respectively. |

MDO = minimum discharge objectives (MDOs) for WWTP effluent that are listed in Appendix B of the Construction Wastewater Treatment Plant Operations Environmental Protection Plan dated February 7, 2024.
N = number of samples.
Non-detect results are screened using the detection limit value.

### 3.7 Non-Contact Water Diversion Ditch Outlets

Water quality results were not available for the non-contact water diversion ditch outlets at the time of reporting. There are no outstanding results for diversion ditch stations.

### 3.8 Freshwater and Estuarine Water Receiving Environment

Freshwater and estuarine water receiving environment samples are screened against BC, Canadian and Federal WQGs for the protection of freshwater or estuarine water aquatic life. Water quality results were not available for the freshwater receiving environment at the time of reporting.

Field and analytical results were available for the August 28 estuarine water sample (as discussed in Weekly Report #29) collected near the mouth of Mill Creek (station SW-03). Results are presented in Table E-1 of Appendix E. Parameter concentrations met WQGs at station SW-03. Several PAHs were detected in the sample collected from SW-03 on August 28 at concentrations above those reported during the pre-construction baseline monitoring program. PAHs were not detected in the samples collected upstream on Mill Creek on August 27 (stations SW-02 and SW-07, Weekly Report #30). Follow-up with the laboratory has been initiated to confirm the analytical results and this item is being tracked in Table 9.

### 3.9 Marine Water Receiving Environment

Marine water receiving environment samples are screened against Canadian, Federal and BC WQGs 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 Appendix F.

Analytical results were available for the August 23, September 4 (field and physical parameters only), September 9 and 10 marine receiving environment samples collected at stations IDZ-E1 and IDZ-E2 at 0.5 and 2 m below the water surface and 2 m above the seafloor. Analytical results were also available for the August 26 marine receiving environment samples collected at reference stations WQR1 and WQR2 at 0.5 and 2 m below the water surface and 2 m above the seafloor.

Parameter concentrations met WQGs except for field pH, dissolved oxygen, and total boron. Field pH was below the lower limit of the WQG in the August 23 samples collected from IDZ-E1 and IDE-E2 at 0.5 m below the surface, and in the August 26 sample from reference station WQR2 at 2 m below the surface. Dissolved oxygen was below the lower limit of the WQG in samples collected from 2 m above the seafloor at IDZ-E1 (September 4) and IDZ-E2 (August 23 and September 4). Total boron concentrations were above the WQG in the August 23 samples collected from 2 m below the surface and 2 m above the seafloor at IDZ-E1, as well as from 2 m above the

seafloor at IDZ-E2. At the reference stations, total boron concentrations were above the WQG in the August 26 samples collected from WQR1 and WQR2 at 2 m above the seafloor, from WQR1 at 2 m below the surface, and from WQR2 at 0.5 m below the surface.

Field pH, dissolved oxygen, and total boron concentrations were within the concentration ranges observed in the pre-construction baseline monitoring program for the marine reference stations and are therefore not considered to be exceedances. There is no pre-construction baseline data for the marine reference stations WQR1 and WQR2 at 0.5 m below surface.

# 4. Quality Control

This section presents the results of the quality control (QC) evaluation for the PE-111578 weekly report (Table 9). The evaluation includes a review of field and lab QC, completeness of the weekly report (*e.g.*, pending data), completeness of the monitoring program, confirmation of recordkeeping, evaluation of compliance and review of water management activities. Items flagged for follow-up in Section 3 are also tracked in Table 9. Any items flagged for follow-up are carried forward to future reports until they are closed.

**Table 9: Weekly Report QC Evaluations and Ongoing Items**

| QC Procedure | Observation | Investigation/Resolution |
|---|---|---|
| **Reporting Period (September 8 – 14, Report #31)** | | |
| **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 undergoing pilot testing. The West Sedimentation Pond is not commissioned for discharge. The non-contact water diversion ditch that discharges at station OUT-06 has been commissioned, and stations for pre-existing outfalls OUT-01, OUT-02, and OUT-11 have also been established. This item remains open. |
| **Pending Data** | Methylmercury, dioxins and furans results for samples collected September 8, 11, and 13 were not reported. | Analytical results for methylmercury, dioxins and furans were not complete at the time of Report #31 preparation for samples collected September 8, 11, and 13. Testing of methylmercury, dioxins and furans typically requires up to 4 weeks to complete. The pending results will be included in future weekly reports when available. This item remains open. |
| **Data Evaluation** | Several PAHs were detected in the sample collected August 28 from the Mill Creek estuary (station SW-03) | Several PAHs were detected in the sample collected from SW-03 on August 28 at concentrations above those reported during the pre-construction baseline monitoring program. PAHs were not detected in the samples collected upstream on Mill Creek on August 27 (stations SW-02 and SW 07, Weekly Report #30). Follow-up with the laboratory has been initiated to confirm the analytical results. This item remains open. |
| | TSS is elevated in the sample collected September 12 from SP-E-NE | TSS was elevated in the sample collected September 12 from the East Sedimentation Pond at the in-pond station SP-E-NE. Laboratory re-analysis has been requested to confirm the analytical result. This item remains open. |
| **Ongoing Items from Previous Weekly Reports** | | |
| **Report #21: WWTP Performance Evaluation** | Dissolved oxygen is frequently outside the treatment MDO. | Previous weekly reports have indicated there was a design MDO for dissolved oxygen, this was incorrect, rather the marine WQG for dissolved oxygen water was evaluated as an MDO. This has been clarified in Appendix C, Table C-1 beginning with Report #24. However, low dissolved oxygen has been observed in sedimentation pond effluent. It is speculated warm weather conditions led to the depletion of oxygen in contact water stored in baker tanks and in the East Sedimentation Pond. Receiving environment monitoring of dissolved oxygen was conducted in the week of September 8-14 during active discharge from the East Sedimentation Pond. The monitoring results determined that dissolved oxygen met WQG within the initial dilution zone as defined in PE-111578. This item is closed. |
| **Report #27: Pending Data** | Analytical results for samples collected August 12, 16, and 17 and dioxins and furans results for samples collected August 13 were not reported. | Analytical results for samples collected August 12, 16, and 17 are discussed in Sections 3.5, 3.6, and 3.9 of Report #28. Dioxin and furan results for samples collected August 12 are discussed in Sections 3.5 and 3.6 of Report #28. Dioxin and furan results for samples collected August 13, 16 and 17 were not complete at the time of Report #31 preparation. Testing of dioxins and furans typically requires up to 4 weeks to complete. The pending results will be included in future weekly reports when available. This item remains open. |
| **Report #27: Sample Integrity** | Dioxin and furans could not be tested in the July 19 IDZ-E1 sample from 2 m below surface. | The laboratory reports that the sample bottles for dioxin and furans were broken during trans-shipment between testing facilities while the sample was under laboratory custody, therefore results for this sample are not available. Root cause investigation by the laboratory is underway. This item remains open. |
| **Report #28: Pending Data** | Analytical results for samples collected August 21 and 23 were not reported. | Available analytical results for samples collected August 21 are discussed in Sections 3.3 and 3.4 of Report #29 with dioxins and furans results still pending. Available analytical results for samples collected August 23 are discussed in Section 3.9 of Report #30. Analytical results for methylmercury, dioxins and furans were not complete at the time of Report #31 preparation. Testing of methylmercury, dioxins and furans typically requires up to 4 weeks to complete. The pending results will be included in future weekly reports when available. This item remains open. |
| **Report #29: Pending Data** | Analytical results for samples collected at marine reference stations on August 26 and the estuarine receiving environment on August 28 were not reported. | Available analytical results for samples collected from the marine reference stations on August 26 and the estuarine receiving environment station on August 28 are discussed in Sections 3.9 and 3.8 of Report #31, respectively. Analytical results for methylmercury, dioxins and furans were not complete at the time of Report #31 preparation. Testing of methylmercury, dioxins and furans typically requires up to 4 weeks to complete. The pending results will be included in future weekly reports when available. This item remains open. |
| **Report #29: Pending Data** | Methylmercury, dioxins and furans results for samples collected August 26 – 29 were not reported. | Methylmercury results are discussed in Sections 3.4 and 3.6 of Report #30. Analytical results for dioxins and furans were not complete at the time of Report #31 preparation for samples collected August 26, 27, 28, and 29. Testing of dioxins and furans typically requires up to 4 weeks to complete. The pending results will be included in future weekly reports when available. This item remains open. |
| **Report #30: Pending Data** | Dioxins and furans results for samples collected September 2 and 4 were not reported. | Analytical results for dioxins and furans were not complete at the time of Report #31 preparation for samples collected September 2 and 4. Testing of dioxins and furans typically requires up to 4 weeks to complete. The pending results will be included in future weekly reports when available. 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 specified or implied requirements.
WWTP performance evaluation is an assessment of WWTP effluent quality compared to operational MDO's and WQG (for dissolved oxygen and total vanadium only).
Data review under QC Procedure indicates an evaluation of data trends or inter-parameter relationships that suggest a test result may not be representative of water quality at the time of monitoring.

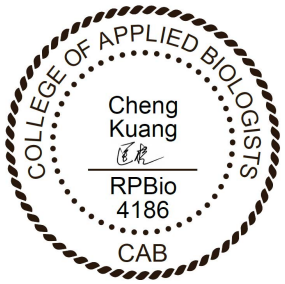
# 5. Closure

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, and Woodfibre LNG staff are conducted as needed to confirm the information presented in this report.

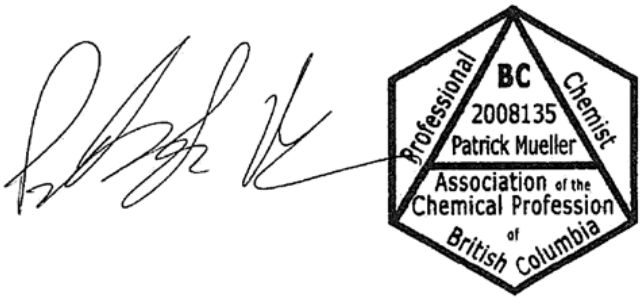
Regards,

**LORAX ENVIRONMENTAL SERVICES LTD.**

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




**Cheng Kuang, M.Sc., RPBio**
**Environmental Scientist**




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


World Imagery: District of Squamish, Maxar. Additional imagery provided by McDermott International captured September 11th, 2024.

## LEGEND

- Freshwater Monitoring Station
- Marine Water Monitoring Station
- Certified Project Area
- Watercourse
- Non Contact Ditch (Under Construction)
- Outfall
- Clean Water Diversion Discharge Station
- Sediment Pond Monitoring Stations (Water Quality)
- Wastewater Treatment Plant (WWTP)

| | |
|---|---|
| DATE SAVED: | Sep 19, 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 (September 14, 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*

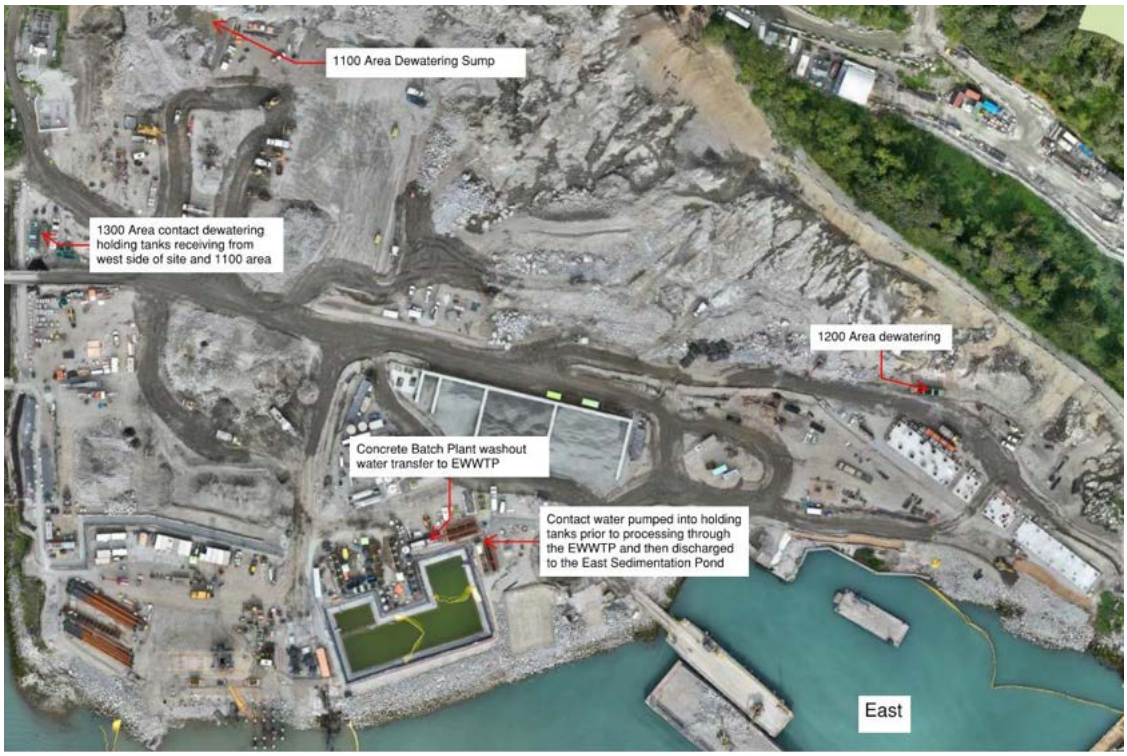



**Figure 2: East Catchment dewatering areas. Contact water from the 1100 and 1300 Areas was directed to the East WWTP during the monitoring period (September 8 – 14).**


**Figure 3: West Catchment dewatering areas. Contact water from the 4100 Area was directed to the East WWTP during the monitoring period (September 8 – 14).**

**Figure 4: Aerial view of the East Sedimentation Pond showing the placement of two sediment curtains (September 13, 2024). The East WWTP is located on the left side of the pond.**

**Figure 5: Aerial view of the West Sedimentation Pond showing the placement of two sediment curtains (September 13, 2024). The West WWTP is located on the right side of the pond.**

# *Appendix B: East Sedimentation Pond Results*

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

| Parameter | Unit | Lowest Applicable Guideline [1] | | PE-111578 Discharge Limit | East Sedimentation Pond | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | Effluent | In-Pond at Influent Location | In-Pond at Effluent Location | In-Pond at Influent Location | In-Pond at Effluent Location |
| | | | | | SP-E-Out | SP-E-NW | SP-E-NE | SP-E-NW | SP-E-NE |
| | | | | | VA24C3555-006 | VA24C3999-002 | VA24C3999-001 | VA24C4193-004 | VA24C4193-003 |
| | | Long Term | Short Term | | 2024-09-08 9:24 | 2024-09-12 12:36 | 2024-09-12 13:30 | 2024-09-14 13:49 | 2024-09-14 14:41 |
| **General Parameters** | | | | | | | | | |
| pH - Field | pH units | - [2] | - | 5.5 - 9.0 | 6.5 | 7.8 | - | 7.8 | 6.9 |
| Conductivity - Field | µS/cm | - | - | - | 1382 | 1250 | - | 1070 | 1252 |
| Temperature - Field | ℃ | - | - | - | 22.7 | 23.6 | - | 19.4 | 19.3 |
| Salinity - Field | ppt | - | - | - | 0.72 | 0.62 | - | 0.6 | 0.7 |
| Turbidity - Field | NTU | - | - | - | 6.03 | 8.85 | 7.93 | 7.48 | 4.16 |
| TSS | mg/L | - | - | 25 | 11.9 | 12.4 | 42.8 | 10.2 | 8.0 |
| Dissolved Oxygen - Field | mg/L | >=8 | - | - | ***5.96*** | 8.55 | - | 8.98 | ***7.12*** |
| **Anions and Nutrients** | | | | | | | | | |
| Sulphate | mg/L | - | - | - | 50.1 | - | - | - | - |
| Chloride | mg/L | - | - | - | 127 | - | - | - | - |
| Fluoride | mg/L | - | 1.5 | - | 0.204 | - | - | - | - |
| Ammonia (N-$NH_3$) | mg/L | Variable [3] | Variable [3] | - | <0.0050 | - | - | - | - |
| Nitrite (N-$NO_2$) | mg/L | - | - | - | <0.0050 | - | - | - | - |
| Nitrate (N-$NO_3$) | mg/L | 3.7 | 339 | - | <0.0250 | - | - | - | - |
| **Total Metals** | | | | | | | | | |
| Aluminum, total (T-Al) | mg/L | - | - | - | 0.092 | 0.182 | 0.77 | 0.154 | 0.26 |
| Antimony, total (T-Sb) | mg/L | - | 0.27 [4] | - | 0.00216 | 0.00195 | 0.00247 | 0.00179 | 0.00221 |
| Arsenic, total (T-As) | mg/L | 0.0125 | 0.0125 | - | 0.00209 | 0.0029 | 0.00233 | 0.00271 | 0.00194 |
| Barium, total (T-Ba) | mg/L | - | - | - | 0.00744 | 0.0134 | 0.0161 | 0.012 | 0.00821 |
| Beryllium, total (T-Be) | mg/L | 0.1 | - | - | <0.000100 | <0.000100 | <0.000100 | <0.000100 | <0.000100 |
| Boron, total (T-B) | mg/L | 1.2 | - | - | 0.083 | 0.121 | 0.084 | 0.091 | 0.055 |
| Cadmium, total (T-Cd) | mg/L | 0.00012 | - | - | <0.0000250 | <0.0000300 | <0.0000750 | <0.0000350 | <0.0000250 |
| Chromium, total (T-Cr) | mg/L | - | - | - | 0.00052 | 0.00059 | 0.00123 | <0.00050 | <0.00050 |
| Cobalt, total (T-Co) | mg/L | - | - | - | <0.00010 | <0.00010 | 0.00039 | <0.00010 | <0.00010 |
| Copper, total (T-Cu) | mg/L | - [2] | - [2] | 0.0043 | 0.00155 | 0.00288 | 0.00482 | 0.00223 | 0.00125 |
| Iron, total (T-Fe) | mg/L | - | - | - | 0.055 | 0.116 | 0.652 | 0.086 | 0.046 |
| Lead, total (T-Pb) | mg/L | - [2] | - [2] | 0.0035 | 0.0035 | 0.000351 | 0.0027 | 0.000332 | 0.000214 |
| Manganese, total (T-Mn) | mg/L | - | - | - | 0.00603 | 0.0126 | 0.0444 | 0.0108 | 0.00403 |
| Mercury, total (T-Hg) | mg/L | 0.000016 [5] | - | - | <0.0000050 | 0.0000061 | 0.0000052 | <0.0000500 | <0.0000500 |
| Molybdenum, total (T-Mo) | mg/L | - | - | - | 0.0645 | 0.0827 | 0.0472 | 0.0701 | 0.0447 |
| Nickel, total (T-Ni) | mg/L | 0.0083 | - | - | 0.00062 | 0.0005 | 0.00151 | <0.00050 | 0.00155 |
| Selenium, total (T-Se) | mg/L | 0.002 | - | - | 0.000226 | 0.000304 | 0.000194 | 0.000225 | 0.000188 |
| Silver, total (T-Ag) | mg/L | 0.0015 | 0.003 | - | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 |
| Thallium, total (T-Tl) | mg/L | - | - | - | <0.000010 | 0.000011 | 0.000013 | <0.000010 | <0.000010 |
| Uranium, total (T-U) | mg/L | - | - | - | 0.0301 | 0.0309 | 0.0224 | 0.0316 | 0.0628 |
| Vanadium, total (T-V) | mg/L | - [2] | - | 0.0081 | 0.00487 | 0.00534 | 0.00412 | 0.00484 | 0.00369 |
| Zinc, total (T-Zn) | mg/L | - [2] | - [2] | 0.0133 | 0.0068 | 0.0181 | 0.0185 | 0.0135 | 0.0052 |
| Hexavalent Chromium, total | mg/L | 0.0015 | - | - | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 |
| **Dissolved Metals** | | | | | | | | | |
| Cadmium, dissolved (D-Cd) | mg/L | - | - | - | <0.0000250 | <0.0000250 | <0.0000200 | <0.0000350 | <0.0000250 |
| Copper, dissolved (D-Cu) | mg/L | - | - | - | 0.00095 | 0.00169 | 0.00079 | 0.00149 | 0.00072 |
| Iron, dissolved (D-Fe) | mg/L | - | - | - | <0.010 | 0.010 | <0.010 | <0.010 | <0.010 |
| Lead, dissolved (D-Pb) | mg/L | - | - | - | 0.00185 | <0.000050 | <0.000050 | <0.000050 | <0.000050 |
| Manganese, dissolved (D-Mn) | mg/L | - | - | - | 0.0041 | 0.00302 | 0.00791 | 0.00197 | 0.00253 |
| Nickel, dissolved (D-Ni) | mg/L | - | - | - | <0.00050 | <0.00050 | 0.00068 | <0.00050 | <0.00050 |
| Strontium, dissolved (D-Sr) | mg/L | - | - | - | 0.0806 | 0.103 | 0.147 | 0.102 | 0.102 |
| Vanadium, dissolved (D-V) | mg/L | - | - | - | 0.00238 | 0.00216 | 0.00148 | 0.00207 | 0.00194 |
| Zinc, dissolved (D-Zn) | mg/L | - | - | - | 0.0046 | 0.0097 | 0.005 | 0.0066 | 0.0031 |
| **Polycyclic Aromatic Hydrocarbons (PAHs)** | | | | | | | | | |
| Acenaphthene | mg/L | 0.006 | - | - | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 |
| Acridine | mg/L | - | - | - | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 |
| Anthracene | mg/L | - | - | - | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 |
| Benz(a)anthracene | mg/L | - | - | - | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 |
| Benzo(a)pyrene | mg/L | 0.00001 | - | - | <0.0000050 | <0.0000050 | <0.0000050 | <0.0000050 | <0.0000050 |
| Chrysene | mg/L | 0.0001 | - | - | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 |
| Fluoranthene | mg/L | - | - | - | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 |
| Fluorene | mg/L | 0.012 | - | - | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 |
| 1-methylnaphthalene | mg/L | 0.001 | - | - | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 |
| 2-methylnaphthalene | mg/L | 0.001 | - | - | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 |
| Naphthalene | mg/L | 0.001 | - | - | <0.000050 | <0.000050 | <0.000050 | <0.000050 | <0.000050 |
| Phenanthrene | mg/L | - | - | - | <0.000020 | <0.000020 | <0.000020 | <0.000020 | <0.000020 |
| Pyrene | mg/L | - | - | - | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 |
| Quinoline | mg/L | - | - | - | <0.000050 | <0.000050 | <0.000050 | <0.000050 | <0.000050 |
| **Volatile Organic Compounds (VOCs)** | | | | | | | | | |
| Benzene | mg/L | 0.11 | - | - | <0.00050 | - | - | - | |
| Ethylbenzene | mg/L | 0.25 | - | - | <0.00050 | - | - | - | |
| Methyl-tert-butyl-ether | mg/L | 5 | 0.44 | - | <0.00050 | - | - | - | |
| Styrene | mg/L | - | - | - | <0.00050 | - | - | - | |
| Toluene | mg/L | 0.215 | - | - | <0.00040 | - | - | - | |
| Total Xylenes | mg/L | - | - | - | <0.00050 | - | - | - | |
| Chlorobenzene | mg/L | 0.025 | - | - | <0.00050 | - | - | - | |
| 1,2-Dichlorobenzene | mg/L | 0.042 | - | - | <0.00050 | - | - | - | |

**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 PE-11578 East Sedimentation Pond Discharge Limit.
The East Sedimentation Pond discharged September 8 – 10 during the monitoring period (September 8 – 14).
[1] The lowest applicable guidelines from approved or working BC WQGs, Canadian (CCME) WQGs and Federal WQGs.
[2] The WQG was not evaluated for parameters with discharge limits.
[3] The BC WQG for total ammonia is salinity, pH and temperature dependent; see Tables 26E and 26F in BC WQG guidance document.
[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, the BC WQG = 0.00002 mg/L. The Canadian WQG = 0.000016 mg/L.

## Table B-2: Summary of East Sedimentation Pond Daily Field Parameters September 8 – 14.

| Parameter | | Temperature | Dissolved Oxygen (DO) | Salinity | Turbidity | pH | Conductivity | Visibility of Sheen | Total Daily Discharge from the East Sedimentation Pond to Howe Sound |
|---|---|---|---|---|---|---|---|---|---|
| **Unit** | | **°C** | **mg/L** | **ppt** | **NTU** | **s.u.** | **µS/cm** | | **$m^3$** |
| **PE-111578 Discharge Limit** | | - | - | - | - | 5.5 - 9.0 | - | - | -[3] |
| **Lowest Applicable Guideline [1]** | | - | >=8 | - | - | -[2] | - | - | - |
| **Station ID [4]** | **Date** | | | | | | | | |
| SP-E-NE | 2024-09-08 8:39 | 22.3 | ***5.62*** | 0.72 | 7.39 | 6.4 | 1371 | No | 1060 |
| SP-E-OUT | 2024-09-08 9:24 | 22.7 | ***5.96*** | 0.72 | 6.03 | 6.5 | 1382 | No | |
| SP-E-OUT | 2024-09-09 13:39 | 23.2 | 11.57 | 0.67 | 8.25 | 6.8 | 1300 | No | 924 |
| SP-E-NE | 2024-09-09 13:55 | 23.6 | 11.27 | 0.66 | 9.01 | 7.0 | 1296 | No | |
| SP-E-NE | 2024-09-10 12:36 | 21.0 | 8.34 | 0.65 | 20.0 | 7.4 | 1202 | No | 242 |
| SP-E-OUT | 2024-09-10 12:47 | 22.2 | ***6.32*** | 0.61 | 4.41 | 6.7 | 1166 | No | |
| SP-E-NE | 2024-09-11 10:40 | - | - | - | 5.12 | 7.0 | - | No | 0 |
| SP-E-NW | 2024-09-12 12:36 | 23.6 | 8.55 | 0.62 | 8.85 | 7.8 | 1250 | No | 0 |
| SP-E-NE | 2024-09-12 13:30 | - | - | - | 7.93 | - | - | No | |
| SP-E-NE | 2024-09-13 11:53 | 20.6 | ***7.10*** | 0.70 | 3.73 | 6.5 | 1276 | No | 0 |
| SP-E-NW | 2024-09-13 12:02 | 20.6 | 8.73 | 0.63 | 6.82 | 7.7 | 1147 | No | |
| SP-E-NW | 2024-09-14 13:49 | 19.4 | 8.98 | 0.60 | 7.48 | 7.8 | 1070 | No | 0 |
| SP-E-NE | 2024-09-14 14:41 | 19.3 | ***7.12*** | 0.70 | 4.16 | 6.9 | 1252 | No | |

**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 PE-11578 East Sedimentation Pond Discharge Limit.
All SP-E-OUT samples collected from May 27 to the time of writing were taken from the sample port which is located near the inlet end of the temporary discharge hose.
The East Sedimentation Pond discharged September 8 – 10 during the monitoring period (September 8 – 14).
[1] The lowest applicable guidelines from approved or working BC WQGs, Canadian (CCME) WQGs and Federal WQGs.
[2] The WQG was not evaluated for parameters with discharge limits.
[3] The annual average authorized discharge rate from the East Sedimentation Pond is 650 $m^3$/day. As noted in PE-111578 Condition 2.1.4, the actual discharge rate may deviate from the annual average rate due to annual variations in precipitation amounts within the catchment area. Therefore, the annual average authorized discharge rate is not evaluated as a discharge limit.
[4] The sedimentation pond did not receive non-contaminated contact water influent September 8 – 14, therefore daily measurements for station SP-E-IN-2 were not collected. The East Sedimentation Pond discharged on September 8 – 10. The East Sedimentation Pond did not discharge September 11 – 14, therefore daily measurements for station SP-E-OUT were not collected. In-Pond stations SP-E-NW and SP-E-NE may be monitored in place of stations SP-E-IN-2 and SP-E-OUT, respectively when there is no influent to, or discharge from the East Sedimentation Pond at the time of monitoring.

# *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 | Operational Minimum Discharge Objective [1] | East WWTP | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Influent | Effluent | Influent | Effluent | Influent | Effluent |
| | | | WWTP-E-IN | WWTP-E-OUT | WWTP-E-IN | WWTP-E-OUT | WWTP-E-IN | WWTP-E-OUT |
| | | | VA24C3555-001 | VA24C3555-002 | VA24C3834-007 | VA24C3834-006 | VA24C4193-001 | VA24C4193-002 |
| | | | 2024-09-08 15:10 | 2024-09-08 15:23 | 2024-09-11 11:06 | 2024-09-11 11:10 | 2024-09-14 14:11 | 2024-09-14 14:24 |
| **General Parameters** | | | | | | | | |
| pH - Field | pH units | 5.5 – 9.0 | 7.2 | 6.4 | 7.1 | 6.3 | 7.1 | 6.6 |
| Conductivity - Field | µS/cm | - | 1297 | 1446 | 1260 | 1337 | 1259 | 1226 |
| Temperature - Field | ℃ | - | 23.5 | 23.4 | 21 | 21 | 19.5 | 18.9 |
| Salinity - Field | ppt | - | 0.67 | 0.76 | 0.68 | 0.67 | 0.71 | 0.7 |
| Turbidity - Field | NTU | - | 8.17 | 4.68 | 6.04 | 3.81 | 5.31 | 5.38 |
| TSS | mg/L | - | 15.5 | 10.5 | 7.3 | 5.9 | 6.6 | 6.2 |
| Dissolved Oxygen - Field | mg/L | - | 6.78 | 4.64 | 6.45 | 4.60 | 6.05 | 6.47 |
| **Anions and Nutrients** | | | | | | | | |
| Sulphate | mg/L | - | 49.4 | 50.5 | 60.7 | 58.4 | - | - |
| Chloride | mg/L | - | 95.5 | 144 | 155 | 153 | - | - |
| Fluoride | mg/L | - | 0.205 | 0.166 | 0.187 | 0.18 | - | - |
| Ammonia ($N\text{-}NH_3$) | mg/L | - | <0.0050 | <0.0050 | <0.0050 | <0.0050 | - | - |
| Nitrite ($N\text{-}NO_2$) | mg/L | - | <0.0050 | <0.0050 | <0.0050 | <0.0050 | - | - |
| Nitrate ($N\text{-}NO_3$) | mg/L | - | <0.0250 | <0.0250 | <0.0250 | <0.0250 | - | - |
| **Total Metals** | | | | | | | | |
| Aluminum, total (T-Al) | mg/L | - | 0.100 | 0.0618 | 0.0792 | 0.0679 | 0.259 | 0.270 |
| Antimony, total (T-Sb) | mg/L | - | 0.00213 | 0.00224 | 0.0025 | 0.00236 | 0.00221 | 0.00212 |
| Arsenic, total (T-As) | mg/L | 0.0125 | 0.00223 | 0.00241 | 0.00193 | 0.00184 | 0.00189 | 0.00192 |
| Barium, total (T-Ba) | mg/L | - | 0.00858 | 0.00735 | 0.00856 | 0.00838 | 0.0082 | 0.00716 |
| Beryllium, total (T-Be) | mg/L | 0.1 | <0.000100 | <0.000100 | <0.000100 | <0.000100 | <0.000100 | <0.000100 |
| Boron, total (T-B) | mg/L | 1.2 | 0.099 | 0.071 | 0.064 | 0.069 | 0.055 | 0.053 |
| Cadmium, total (T-Cd) | mg/L | 0.00012 | <0.0000300 | <0.0000250 | <0.0000200 | <0.0000200 | <0.0000250 | <0.0000250 |
| Chromium, total (T-Cr) | mg/L | - | 0.00054 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 |
| Cobalt, total (T-Co) | mg/L | - | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 |
| Copper, total (T-Cu) | mg/L | 0.0043 | 0.00292 | 0.00291 | 0.00181 | 0.00158 | 0.00174 | 0.00116 |
| Iron, total (T-Fe) | mg/L | - | 0.054 | 0.034 | 0.043 | 0.036 | 0.046 | 0.036 |
| Lead, total (T-Pb) | mg/L | 0.0035 | 0.000282 | 0.000916 | 0.000254 | 0.000364 | 0.00022 | 0.000224 |
| Manganese, total (T-Mn) | mg/L | - | 0.0106 | 0.00293 | 0.00834 | 0.00767 | 0.00414 | 0.00223 |
| Mercury, total (T-Hg) | mg/L | 0.000016 | <0.0000050 | <0.0000050 | <0.0000050 | <0.0000050 | <0.0000500 | <0.0000500 |
| Molybdenum, total (T-Mo) | mg/L | - | 0.0703 | 0.0584 | 0.0478 | 0.0458 | 0.0441 | 0.0454 |
| Nickel, total (T-Ni) | mg/L | 0.0083 | 0.00096 | 0.0007 | 0.00073 | 0.00074 | 0.0018 | 0.00127 |
| Selenium, total (T-Se) | mg/L | | 0.000211 | 0.000197 | 0.000164 | 0.000139 | 0.000171 | 0.000166 |
| Silver, total (T-Ag) | mg/L | 0.0015 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 |
| Thallium, total (T-Tl) | mg/L | - | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 |
| Uranium, total (T-U) | mg/L | - | 0.0301 | 0.0159 | 0.0227 | 0.0192 | 0.0592 | 0.0624 |
| Vanadium, total (T-V) | mg/L | 0.0081 | 0.00496 | 0.00465 | 0.00404 | 0.00362 | 0.00364 | 0.00371 |
| Zinc, total (T-Zn) | mg/L | 0.0133 | ***0.0202*** | ***0.144*** | 0.0086 | ***0.0190*** | 0.0075 | 0.0088 |
| Hexavalent Chromium, total | mg/L | 0.0015 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 |
| **Dissolved Metals** | | | | | | | | |
| Cadmium, dissolved (D-Cd) | mg/L | 0.00012 | <0.0000300 | <0.0000250 | <0.0000200 | <0.0000150 | <0.0000250 | <0.0000200 |
| Copper, dissolved (D-Cu) | mg/L | - | 0.00148 | 0.0011 | 0.0012 | 0.00114 | 0.00116 | 0.00111 |
| Iron, dissolved (D-Fe) | mg/L | - | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| Lead, dissolved (D-Pb) | mg/L | - | 0.000082 | 0.000169 | 0.000064 | 0.000103 | 0.000063 | 0.000131 |
| Manganese, dissolved (D-Mn) | mg/L | - | 0.00734 | 0.00252 | 0.0048 | 0.00256 | 0.00248 | 0.00044 |
| Nickel, dissolved (D-Ni) | mg/L | - | <0.00050 | <0.00050 | 0.0006 | 0.00068 | 0.001 | <0.00050 |
| Strontium, dissolved (D-Sr) | mg/L | - | 0.0906 | 0.0993 | 0.119 | 0.117 | 0.105 | 0.0932 |
| Vanadium, dissolved (D-V) | mg/L | - | 0.00191 | 0.00224 | 0.00160 | 0.00141 | 0.00196 | 0.00196 |
| Zinc, dissolved (D-Zn) | mg/L | - | 0.0133 | 0.0116 | 0.0091 | 0.0180 | 0.0109 | 0.117 |
| **Polycyclic Aromatic Hydrocarbons (PAHs)** | | | | | | | | |
| Acenaphthene | mg/L | - | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 |
| Acridine | mg/L | - | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 |
| Anthracene | mg/L | - | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 |
| Benz(a)anthracene | mg/L | - | <0.000010 | <0.000010 | 0.000013 | <0.000010 | <0.000010 | <0.000010 |
| Benzo(a)pyrene | mg/L | 0.00001 | <0.0000050 | <0.0000050 | 0.0000092 | <0.0000050 | <0.0000050 | <0.0000050 |
| Chrysene | mg/L | 0.0001 | <0.000010 | <0.000010 | <0.000025 | <0.000010 | <0.000010 | <0.000010 |
| Fluoranthene | mg/L | - | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 |
| Fluorene | mg/L | 0.012 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 |
| 1-methylnaphthalene | mg/L | - | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 |
| 2-methylnaphthalene | mg/L | - | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 |
| Naphthalene | mg/L | 0.001 | <0.000050 | <0.000050 | <0.000050 | <0.000050 | <0.000050 | <0.000050 |
| Phenanthrene | mg/L | - | <0.000020 | <0.000020 | <0.000020 | <0.000020 | <0.000020 | <0.000020 |
| Pyrene | mg/L | - | <0.000010 | <0.000010 | 0.000029 | <0.000010 | <0.000010 | <0.000010 |
| Quinoline | mg/L | - | <0.000050 | <0.000050 | <0.000050 | <0.000050 | <0.000050 | <0.000050 |
| **Volatile Organic Compounds (VOCs)** | | | | | | | | |
| Benzene | mg/L | 0.11 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | - | - |
| Ethylbenzene | mg/L | 0.25 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | - | - |
| Methyl-tert-butyl-ether | mg/L | 0.44 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | - | - |
| Styrene | mg/L | - | <0.00050 | <0.00050 | <0.00050 | <0.00050 | - | - |
| Toluene | mg/L | 0.215 | <0.00040 | <0.00040 | <0.00040 | <0.00040 | - | - |
| Total Xylenes | mg/L | - | <0.00050 | <0.00050 | <0.00050 | <0.00050 | - | - |
| Chlorobenzene | mg/L | - | <0.00050 | <0.00050 | <0.00050 | <0.00050 | - | - |
| 1,2-Dichlorobenzene | mg/L | - | <0.00050 | <0.00050 | <0.00050 | <0.00050 | - | - |

**Notes:**

[1] Operational minimum discharge objectives (MDOs) for WWTP effluent that are listed in Appendix B of the Construction Wastewater Treatment Plant Operations Environmental Protection Plan dated February 7, 2024.

Results ***underlined in bold italics*** exceed the applicable minimum discharge objective.

## Table C-2: Summary of East Wastewater Treatment Plant Daily Field Parameters September 8 – 14.

| **Parameter** | | **Temperature** | **Dissolved Oxygen (DO)** | **Salinity** | **Turbidity** | **pH** | **Conductivity** | **Visibility of Sheen** | **Total Daily Discharge from the East WWTP** |
|---|---|---|---|---|---|---|---|---|---|
| **Unit** | | **°C** | **mg/L** | **ppt** | **NTU** | **s.u.** | **µS/cm** | | **$m^3$** |
| **PE-111578 Discharge Limit [1]** | | - | - | - | - | - | - | - | 1,100 |
| **Minimum Discharge Objective [2]** | | - | - | - | - | 5.5 – 9.0 | - | - | - |
| **Station ID** | **Date** | | | | | | | | |
| WWTP-E-IN | 2024-09-08 15:10 | 23.5 | 6.78 | 0.67 | 8.17 | 7.2 | 1297 | No | - |
| WWTP-E-OUT | 2024-09-08 15:23 | 23.4 | 4.64 | 0.76 | 4.68 | 6.4 | 1446 | No | 604 |
| WWTP-E-IN | 2024-09-09 | -[3] | -[3] | -[3] | -[3] | -[3] | -[3] | -[3] | - |
| WWTP-E-OUT | 2024-09-09 | -[3] | -[3] | -[3] | -[3] | -[3] | -[3] | -[3] | 644 |
| WWTP-E-IN | 2024-09-10 12:57 | 22.1 | 6.56 | 0.56 | 23.1 | 7.2 | 1243 | No | - |
| WWTP-E-OUT | 2024-09-10 13:37 | -[4] | 8.31 | 0.71 | 4.21 | 6.3 | 1362 | No | 526 |
| WWTP-E-IN | 2024-09-11 11:06 | 21.0 | 6.45 | 0.68 | 6.04 | 7.1 | 1260 | No | - |
| WWTP-E-OUT | 2024-09-11 11:10 | 21.0 | 4.60 | 0.67 | 3.81 | 6.3 | 1337 | No | 535 |
| WWTP-E-IN | 2024-09-12 13:01 | -[5] | -[5] | -[5] | 4.39 | -[5] | -[5] | -[5] | - |
| WWTP-E-OUT | 2024-09-12 13:10 | -[5] | -[5] | -[5] | 3.49 | -[5] | -[5] | -[5] | 439 |
| WWTP-E-IN | 2024-09-13 12:02 | 20.5 | 6.81 | 0.70 | 3.04 | 6.8 | 1274 | No | - |
| WWTP-E-OUT | 2024-09-13 12:05 | 20.7 | 6.52 | 0.69 | 6.12 | 6.5 | 1263 | No | 537 |
| WWTP-E-IN | 2024-09-14 14:11 | 19.5 | 6.05 | 0.71 | 5.31 | 7.1 | 1259 | No | - |
| WWTP-E-OUT | 2024-09-14 14:24 | 18.9 | 6.47 | 0.70 | 5.38 | 6.6 | 1226 | No | 612 |

**Notes:**
[1] PE-111578 East WWTP Discharge Limit is applied to effluent compliance station WWTP-E-OUT.
[2] Operational minimum discharge objectives (MDOs) for WWTP effluent that are listed in Appendix B of the Construction Wastewater Treatment Plant Operations Environmental Protection Plan dated February 7, 2024.
[3] Field measurements were collected each day during the monitoring period at the influent (WWTP-E-IN) and effluent (WWTP-E-OUT) stations except on September 9 as the East WWTP was not discharging at the time of monitoring.
[4] Field temperature was not recorded for WWTP-E-IN on September 10.
[5] Only field turbidity measurements were recorded for WWTP-E-IN and WWTP-E-OUT on September 12 due to a field probe malfunction.
Results ***underlined in bold italics*** do not meet the applicable minimum discharge objective (except DO).

# *Appendix D: West Wastewater Treatment Plant Results*

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

| Parameter | Unit | Minimum Discharge Objective [1] | West WWTP | | | |
|---|---|---|---|---|---|---|
| | | | Influent | Effluent | Influent | Effluent |
| | | | WWTP-W-IN | WWTP-W-OUT | WWTP-W-IN | WWTP-W-OUT |
| | | | VA24C3834-002 | VA24C3834-001 | VA24C4105-001 | VA24C4105-002 |
| | | | 2024-09-11 9:15 | 2024-09-11 9:39 | 2024-09-13 16:08 | 2024-09-13 16:34 |
| **General Parameters** | | | | | | |
| pH - Field | pH units | 5.5 – 9.0 | 7.5 | 6.3 | 7.4 | 6.2 |
| Conductivity - Field | µS/cm | - | 1187 | 1149 | 1221 | 1245 |
| Temperature - Field | °C | - | 19.4 | 17.4 | 19.1 | 19.3 |
| Salinity - Field | ppt | - | 0.67 | 0.68 | 0.69 | 0.7 |
| Turbidity - Field | NTU | - | 11.9 | 5.39 | 18 | 5.82 |
| TSS | mg/L | - | 16.3 | 9.3 | 20.6 | 8.0 |
| Dissolved Oxygen - Field | mg/L | - | 7.95 | 5.82 | 7.41 | 5.83 |
| **Anions and Nutrients** | | | | | | |
| Sulphate | mg/L | - | 63.8 | 64.2 | 62.8 | 64.9 |
| Chloride | mg/L | - | 186 | 190 | 182 | 188 |
| Fluoride | mg/L | - | 0.156 | 0.155 | 0.158 | 0.165 |
| Ammonia ($N\text{-}NH_3$) | mg/L | - | <0.0050 | <0.0050 | <0.0050 | <0.0050 |
| Nitrite ($N\text{-}NO_2$) | mg/L | - | <0.0050 | <0.0050 | <0.0050 | <0.0050 |
| Nitrate ($N\text{-}NO_3$) | mg/L | - | <0.0250 | <0.0250 | <0.0250 | <0.0250 |
| **Total Metals** | | | | | | |
| Aluminum, total (T-Al) | mg/L | - | 0.306 | 0.0287 | 0.742 | 1.06 |
| Antimony, total (T-Sb) | mg/L | - | 0.00294 | 0.00266 | 0.00281 | 0.00281 |
| Arsenic, total (T-As) | mg/L | 0.0125 | 0.00213 | 0.00182 | 0.00204 | 0.00186 |
| Barium, total (T-Ba) | mg/L | - | 0.0301 | 0.0416 | 0.0289 | 0.00815 |
| Beryllium, total (T-Be) | mg/L | 0.1 | <0.000100 | <0.000100 | <0.000100 | <0.000100 |
| Boron, total (T-B) | mg/L | 1.2 | 0.105 | 0.012 | 0.058 | <0.010 |
| Cadmium, total (T-Cd) | mg/L | 0.00012 | 0.0000587 | 0.0000239 | 0.0000797 | <0.0000250 |
| Chromium, total (T-Cr) | mg/L | - | 0.00082 | <0.00050 | 0.00092 | <0.00050 |
| Cobalt, total (T-Co) | mg/L | - | 0.00014 | 0.00041 | 0.0003 | <0.00010 |
| Copper, total (T-Cu) | mg/L | 0.0043 | 0.00315 | 0.00205 | ***0.0201*** | 0.00334 |
| Iron, total (T-Fe) | mg/L | - | 0.164 | 1.19 | 0.51 | 0.151 |
| Lead, total (T-Pb) | mg/L | 0.0035 | 0.000865 | 0.000353 | 0.0028 | 0.000491 |
| Manganese, total (T-Mn) | mg/L | - | 0.00903 | 0.128 | 0.0168 | 0.00179 |
| Mercury, total (T-Hg) | mg/L | 0.000016 | <0.0000050 | <0.0000050 | 0.0000073 | <0.0000050 |
| Molybdenum, total (T-Mo) | mg/L | - | 0.0467 | 0.0188 | 0.0338 | 0.0347 |
| Nickel, total (T-Ni) | mg/L | 0.0083 | 0.001 | 0.00766 | 0.00285 | 0.00293 |
| Selenium, total (T-Se) | mg/L | - | 0.000243 | 0.000168 | 0.000272 | 0.000204 |
| Silver, total (T-Ag) | mg/L | 0.0015 | <0.000010 | <0.000010 | 0.000013 | <0.000010 |
| Thallium, total (T-Tl) | mg/L | - | 0.000012 | <0.000010 | 0.000012 | <0.000010 |
| Uranium, total (T-U) | mg/L | - | 0.0195 | 0.0116 | 0.0167 | 0.0114 |
| Vanadium, total (T-V) | mg/L | 0.0081 | 0.00582 | 0.00300 | 0.00611 | 0.00300 |
| Zinc, total (T-Zn) | mg/L | 0.0133 | 0.0112 | ***0.0648*** | ***0.0335*** | ***0.0227*** |
| Hexavalent Chromium, total | mg/L | 0.0015 | <0.00050 | <0.00050 | <0.00050 | <0.00050 |
| **Dissolved Metals** | | | | | | |
| Cadmium, dissolved (D-Cd) | mg/L | 0.00012 | <0.0000400 | 0.0000209 | <0.0000550 | <0.0000150 |
| Copper, dissolved (D-Cu) | mg/L | - | 0.00181 | 0.00152 | 0.002 | 0.00103 |
| Iron, dissolved (D-Fe) | mg/L | - | <0.010 | 1.36 | <0.010 | 0.059 |
| Lead, dissolved (D-Pb) | mg/L | - | 0.00009 | 0.000197 | 0.000156 | 0.000089 |
| Manganese, dissolved (D-Mn) | mg/L | - | 0.0006 | 0.125 | 0.00438 | 0.00111 |
| Nickel, dissolved (D-Ni) | mg/L | - | 0.00079 | 0.00736 | 0.00145 | 0.0071 |
| Strontium, dissolved (D-Sr) | mg/L | - | 0.209 | 0.209 | 0.173 | 0.079 |
| Vanadium, dissolved (D-V) | mg/L | - | 0.00192 | <0.00050 | 0.00218 | 0.00055 |
| Zinc, dissolved (D-Zn) | mg/L | - | 0.0054 | 0.0742 | 0.0105 | 0.0112 |
| **Polycyclic Aromatic Hydrocarbons (PAHs)** | | | | | | |
| Acenaphthene | mg/L | - | 0.000052 | 0.000014 | 0.000065 | 0.000073 |
| Acridine | mg/L | - | <0.000010 | <0.000010 | <0.000010 | <0.000010 |
| Anthracene | mg/L | - | <0.000010 | <0.000010 | <0.000010 | <0.000010 |
| Benz(a)anthracene | mg/L | - | <0.000010 | <0.000010 | <0.000010 | <0.000010 |
| Benzo(a)pyrene | mg/L | 0.00001 | <0.0000050 | <0.0000050 | <0.0000050 | <0.0000050 |
| Chrysene | mg/L | 0.0001 | <0.000010 | <0.000010 | <0.000010 | <0.000010 |
| Fluoranthene | mg/L | - | 0.000020 | <0.000010 | 0.000038 | <0.000010 |
| Fluorene | mg/L | 0.012 | 0.000048 | <0.000010 | 0.000053 | 0.000056 |
| 1-methylnaphthalene | mg/L | - | 0.000023 | 0.000015 | 0.000028 | 0.00003 |
| 2-methylnaphthalene | mg/L | - | 0.000033 | 0.000021 | 0.000043 | 0.000053 |
| Naphthalene | mg/L | 0.001 | 0.000102 | <0.000050 | 0.000131 | 0.000098 |
| Phenanthrene | mg/L | - | 0.000078 | <0.000020 | 0.000093 | 0.00005 |
| Pyrene | mg/L | - | 0.000011 | <0.000010 | 0.000025 | <0.000010 |
| Quinoline | mg/L | - | <0.000050 | <0.000050 | <0.000050 | <0.000050 |
| **Volatile Organic Compounds (VOCs)** | | | | | | |
| Benzene | mg/L | 0.11 | <0.00050 | <0.00050 | <0.00050 | <0.00050 |
| Ethylbenzene | mg/L | 0.25 | <0.00050 | <0.00050 | <0.00050 | <0.00050 |
| Methyl-tert-butyl-ether | mg/L | 0.44 | <0.00050 | <0.00050 | <0.00050 | <0.00050 |
| Styrene | mg/L | - | <0.00050 | <0.00050 | <0.00050 | <0.00050 |
| Toluene | mg/L | 0.215 | <0.00040 | <0.00040 | <0.00040 | <0.00040 |
| Total Xylenes | mg/L | - | <0.00050 | <0.00050 | <0.00050 | <0.00050 |
| Chlorobenzene | mg/L | - | <0.00050 | <0.00050 | <0.00050 | <0.00050 |
| 1,2-Dichlorobenzene | mg/L | - | <0.00050 | <0.00050 | <0.00050 | <0.00050 |

**Notes:**
[1] Operational minimum discharge objectives (MDOs) for WWTP effluent that are listed in Appendix B of the Construction Wastewater Treatment Plant Operations Environmental Protection Plan dated February 7, 2024.
Results ***underlined in bold italics*** exceed the applicable minimum discharge objective.

## Table D-2: Summary of West Wastewater Treatment Plant Daily Field Parameters September 8 – 14.

| **Parameter** | | **Temperature** | **Dissolved Oxygen (DO)** | **Salinity** | **Turbidity** | **pH** | **Conductivity** | **Visibility of Sheen** | **Total Daily Discharge from the West WWTP** |
|---|---|---|---|---|---|---|---|---|---|
| **Unit** | | **°C** | **mg/L** | **ppt** | **NTU** | **s.u.** | **µS/cm** | | **$m^3$** |
| **PE-111578 Discharge Limit [1]** | | - | - | - | - | - | - | - | 120 |
| **Minimum Discharge Objective [2]** | | - | - | - | - | 5.5 – 9.0 | - | - | - |
| **Station ID** | **Date** | | | | | | | | |
| WWTP-W-IN | 2024-09-08 16:22 | 22.4 | 10.23 | 0.69 | 8.20 | 7.6 | 1312 | No | - |
| WWTP-W-OUT | 2024-09-08 16:28 | 23.4 | 2.77 | 0.69 | 4.01 | 6.8 | 1348 | No | 31.3 |
| WWTP-W-IN | 2024-09-09 18:18 | 23.5 | 10.10 | 0.68 | 10.14 | 7.1 | 1323 | No | - |
| WWTP-W-OUT | 2024-09-09 18:14 | 23.3 | 5.52 | 0.67 | 4.64 | 6.4 | 1300 | No | 27.6 |
| WWTP-W-IN | 2024-09-10 | -[3] | -[3] | -[3] | -[3] | -[3] | -[3] | -[3] | - |
| WWTP-W-OUT | 2024-09-10 | -[3] | -[3] | -[3] | -[3] | -[3] | -[3] | -[3] | 0 |
| WWTP-W-IN | 2024-09-11 9:15 | 19.4 | 7.95 | 0.67 | 11.9 | 7.5 | 1187 | No | - |
| WWTP-W-OUT | 2024-09-11 9:39 | 17.4 | 5.82 | 0.68 | 5.39 | 6.3 | 1149 | No | 25.3 |
| WWTP-W-IN | 2024-09-12 | -[3] | -[3] | -[3] | -[3] | -[3] | -[3] | -[3] | - |
| WWTP-W-OUT | 2024-09-12 | -[3] | -[3] | -[3] | -[3] | -[3] | -[3] | -[3] | 17.1 |
| WWTP-W-IN | 2024-09-13 16:08 | 19.1 | 7.41 | 0.69 | 18.0 | 7.4 | 1221 | No | - |
| WWTP-W-OUT | 2024-09-13 16:34 | 19.3 | 5.83 | 0.70 | 5.82 | 6.2 | 1245 | No | 20.8 |
| WWTP-W-IN | 2024-09-14 15:10 | 19.3 | 6.92 | 0.64 | 12.9 | 6.7 | 1133 | No | - |
| WWTP-W-OUT | 2024-09-14 15:06 | 17.5 | 8.98 | 0.60 | 7.48 | 7.8 | 1070 | No | 38.6 |

**Notes:**
[1] PE-111578 West WWTP Discharge Limit is applied to effluent compliance station WWTP-W-OUT.
[2] Operational minimum discharge objectives (MDOs) for WWTP effluent that are listed in Appendix B of the Construction Wastewater Treatment Plant Operations Environmental Protection Plan dated February 7, 2024.
[3] Field measurements were collected each day during the monitoring period at the influent (WWTP-W-IN) and effluent (WWTP-W-OUT) stations except on September 10 and 12 as the West WWTP was not discharging at the time of monitoring.
Results ***underlined in bold italics*** do not meet the applicable minimum discharge objective (except DO).

# *Appendix E: Estuarine Receiving Environment Results*

## Table E-1: Summary of Mill Creek Estuary Water Quality Results Received at the Time of Reporting.

| Parameter | Unit | Lowest Applicable Guideline [1, 2] | | Station SW-03<br>Mill Creek Estuary<br>SW-03<br>VA24C2397-001<br>2024-08-28 17:51 |
|---|---|---|---|---|
| | | Long Term | Short Term | |
| **General Parameters** | | | | |
| pH - Field | pH units | 7.0 - 8.7 | - | 7.4 |
| Specific Conductivity - Field | µS/cm | - | - | 2649 |
| Temperature - Field | °C | - | - | 12.9 |
| Salinity - Field | ppt | - | - | 1.4 |
| Turbidity - Field | NTU | - | - | 5.78 |
| TSS | mg/L | - | - | <3.0 |
| Dissolved Oxygen - Field | mg/L | - | - | 11.26 |
| **Anions and Nutrients** | | | | |
| Sulphate | mg/L | - | - | 64.9 |
| Chloride | mg/L | - | - | 475 |
| Fluoride | mg/L | - | - | <0.200 |
| Ammonia (N-$NH_3$) | mg/L | - | - | <0.0050 |
| Nitrite (N-$NO_2$) | mg/L | - | - | <0.0100 |
| Nitrate (N-$NO_3$) | mg/L | - | - | 0.0913 |
| **Total Metals** | | | | |
| Aluminum, total (T-Al) | mg/L | - | - | 0.135 |
| Antimony, total (T-Sb) | mg/L | - | - | 0.00011 |
| Arsenic, total (T-As) | mg/L | - | - | 0.00018 |
| Barium, total (T-Ba) | mg/L | - | - | 0.00717 |
| Beryllium, total (T-Be) | mg/L | - | - | <0.000100 |
| Boron, total (T-B) | mg/L | - | - | 0.136 |
| Cadmium, total (T-Cd) | mg/L | - | - | 0.0000084 |
| Chromium, total (T-Cr) | mg/L | - | - | <0.00050 |
| Cobalt, total (T-Co) | mg/L | - | - | <0.00010 |
| Copper, total (T-Cu) | mg/L | 0.002 | 0.003 | 0.0008 |
| Iron, total (T-Fe) | mg/L | - | - | 0.083 |
| Lead, total (T-Pb) | mg/L | 0.002 | 0.14 | 0.000196 |
| Manganese, total (T-Mn) | mg/L | - | - | 0.00406 |
| Mercury, total (T-Hg) [3] | mg/L | 0.00002 | - | <0.0000050 |
| Molybdenum, total (T-Mo) | mg/L | - | - | 0.000966 |
| Nickel, total (T-Ni) | mg/L | - | - | <0.00050 |
| Selenium, total (T-Se) | mg/L | - | - | <0.000050 |
| Silver, total (T-Ag) | mg/L | 0.0015 | 0.003 | <0.000010 |
| Thallium, total (T-Tl) | mg/L | - | - | <0.000010 |
| Uranium, total (T-U) | mg/L | - | - | 0.000241 |
| Vanadium, total (T-V) | mg/L | - | - | 0.0006 |
| Zinc, total (T-Zn) | mg/L | - | - | <0.0030 |
| Hexavalent Chromium, total | mg/L | - | - | <0.00050 |
| **Dissolved Metals** | | | | |
| Cadmium, dissolved (D-Cd) | mg/L | - | - | 0.0000076 |
| Copper, dissolved (D-Cu) | mg/L | - | - | 0.00048 |
| Iron, dissolved (D-Fe) | mg/L | - | - | <0.010 |
| Lead, dissolved (D-Pb) | mg/L | - | - | <0.000050 |
| Manganese, dissolved (D-Mn) | mg/L | - | - | 0.00182 |
| Nickel, dissolved (D-Ni) | mg/L | - | - | <0.00050 |
| Strontium, dissolved (D-Sr) | mg/L | - | - | 0.215 |
| Vanadium, dissolved (D-V) | mg/L | - | - | <0.00050 |
| Zinc, dissolved (D-Zn) | mg/L | - | - | 0.0014 |
| **Polycyclic Aromatic Hydrocarbons (PAHs)** | | | | |
| Acenaphthene | mg/L | - | - | 0.000040 |
| Acridine | mg/L | - | - | <0.000010 |
| Anthracene | mg/L | - | - | <0.000010 |
| Benz(a)anthracene | mg/L | - | - | <0.000010 |
| Benzo(a)pyrene | mg/L | - | - | <0.0000050 |
| Chrysene | mg/L | - | - | <0.000010 |
| Fluoranthene | mg/L | - | - | 0.000047 |
| Fluorene | mg/L | - | - | 0.000056 |
| 1-methylnaphthalene | mg/L | - | - | 0.000028 |
| 2-methylnaphthalene | mg/L | - | - | 0.000028 |
| Naphthalene | mg/L | - | - | 0.000076 |
| Phenanthrene | mg/L | - | - | 0.000098 |
| Pyrene | mg/L | - | - | 0.000030 |
| Quinoline | mg/L | - | - | <0.000050 |
| **Volatile Organic Compounds (VOCs)** | | | | |
| Benzene | mg/L | - | - | <0.00050 |
| Ethylbenzene | mg/L | - | - | <0.00050 |
| Methyl-tert-butyl-ether | mg/L | - | - | <0.00050 |
| Styrene | mg/L | - | - | <0.00050 |
| Toluene | mg/L | - | - | <0.00040 |
| Total Xylenes | mg/L | - | - | <0.00050 |
| Chlorobenzene | mg/L | - | - | <0.00050 |
| 1,2-Dichlorobenzene | mg/L | - | - | <0.00050 |

Notes:
Results in ***underlined in bold italics*** exceed the applicable long-term water quality guideline for the protection of estuarine water aquatic life.
Shaded results exceed the applicable short-term water quality guideline for the protection of estuarine water aquatic life.
[1] Approved British Columbia Water Quality Guidelines for the protection of estuarine 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 estuarine aquatic life (CCME, 2021).
[3] When MeHg ⩽ 0.5% of total Hg, BC WQG = 0.00002 mg/L.

# *Appendix F: Marine Water Receiving Environment Results*

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

| Parameter | Unit | Lowest Applicable Guideline [1] | | 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 |
| | | | | VA24C1684-001 | VA24C1684-002 | VA24C1684-003 | VA24C1684-004 | VA24C1684-005 | VA24C1684-006 |
| | | Long Term | Short Term | 2024-08-23 9:35 | 2024-08-23 10:00 | 2024-08-23 10:15 | 2024-08-23 11:00 | 2024-08-23 11:20 | 2024-08-23 11:45 |
| **General Parameters** | | | | | | | | | |
| pH - Field | pH units | 7.0 - 8.7 | - | ***6.1*** | 7.3 | 7.8 | ***6.6*** | 7.4 | 7.4 |
| Specific Conductivity - Field | µS/cm | - | - | 7447 | 9774 | 39950 | 6758 | 12014 | 31430 |
| Temperature - Field | ℃ | - | - | 13.8 | 14.4 | 13.4 | 13.8 | 14.2 | 9.8 |
| Salinity - Field | ppt | Narrative[2] | - | 5.35 | 7.05 | 25.51 | 4.82 | 8.85 | 28.42 |
| Turbidity - Field | NTU | Narrative[2] | Narrative[2] | 6.14 | 7.25 | 7.76 | 14.33 | 8.98 | 1.27 |
| TSS | mg/L | Narrative[2] | Narrative[2] | 9.7 | 5.5 | 2.2 | 7.7 | 9.1 | <2.0 |
| Dissolved Oxygen - Field | mg/L | >=8 | - | 10.32 | 10.40 | 8.91 | 10.18 | 10.51 | ***5.92*** |
| **Anions and Nutrients** | | | | | | | | | |
| Sulphate | mg/L | - | - | 452 | 1040 | 1950 | 568 | 544 | 2200 |
| Chloride | mg/L | - | - | 3460 | 7660 | 14700 | 4360 | 4210 | 15900 |
| Fluoride | mg/L | - | 1.5 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Ammonia (N-$NH_3$) | mg/L | Variable [3] | Variable [3] | 0.0059 | <0.0050 | 0.0074 | 0.007 | 0.006 | <0.0050 |
| Nitrite (N-$NO_2$) | mg/L | - | - | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Nitrate (N-$NO_3$) | mg/L | 3.7 | 339 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 |
| **Total Metals** | | | | | | | | | |
| Aluminum, total (T-Al) | mg/L | - | - | 0.323 | 0.172 | 0.0553 | 0.436 | 0.325 | 0.0340 |
| Antimony, total (T-Sb) | mg/L | - | 0.27 [4] | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 |
| Arsenic, total (T-As) | mg/L | 0.0125 | 0.0125 | 0.00151 | 0.00246 | 0.00351 | 0.00115 | 0.00128 | 0.00357 |
| Barium, total (T-Ba) | mg/L | - | - | 0.0199 | 0.017 | 0.0127 | 0.0205 | 0.0198 | 0.0127 |
| Beryllium, total (T-Be) | mg/L | 0.1 | - | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 |
| Boron, total (T-B) | mg/L | 1.2 | - | 0.80 | ***1.71*** | ***3.55*** | 0.70 | 0.78 | ***3.7*** |
| Cadmium, total (T-Cd) | mg/L | 0.00012 | - | <0.000020 | 0.000035 | 0.000052 | 0.000022 | <0.000020 | 0.000069 |
| Chromium, total (T-Cr) | mg/L | - | - | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 |
| Cobalt, total (T-Co) | mg/L | - | - | 0.000185 | 0.000142 | 0.000102 | 0.000218 | 0.000189 | 0.000102 |
| Copper, total (T-Cu) | mg/L | 0.002 | 0.003 | 0.00156 | 0.00151 | 0.00092 | 0.00140 | 0.00138 | 0.0011 |
| Iron, total (T-Fe) | mg/L | - | - | 0.269 | 0.157 | 0.056 | 0.363 | 0.277 | 0.034 |
| Lead, total (T-Pb) | mg/L | 0.002 | 0.14 | <0.00010 | <0.00010 | 0.00019 | <0.00010 | <0.00010 | <0.00010 |
| Manganese, total (T-Mn) | mg/L | - | - | 0.0119 | 0.00809 | 0.00337 | 0.014 | 0.0121 | 0.00435 |
| Mercury, total (T-Hg) | mg/L | 0.000016 [5] | - | <0.0000050 | <0.0000050 | <0.0000050 | <0.0000050 | <0.0000050 | <0.0000050 |
| Molybdenum, total (T-Mo) | mg/L | - | - | 0.00181 | 0.00419 | 0.00763 | 0.00178 | 0.0018 | 0.00797 |
| Nickel, total (T-Ni) | mg/L | 0.0083 | - | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 |
| Selenium, total (T-Se) | mg/L | 0.002 | - | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 |
| Silver, total (T-Ag) | mg/L | 0.0015 | 0.003 | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 |
| Thallium, total (T-Tl) | mg/L | - | - | <0.000050 | <0.000050 | <0.000050 | <0.000050 | <0.000050 | <0.000050 |
| Uranium, total (T-U) | mg/L | - | - | 0.000542 | 0.0014 | 0.00267 | 0.000399 | 0.000395 | 0.00293 |
| Vanadium, total (T-V) | mg/L | 0.005 | - | 0.00114 | 0.00122 | 0.00131 | 0.00140 | 0.00121 | 0.00134 |
| Zinc, total (T-Zn) | mg/L | 0.01 | 0.055 | <0.0030 | <0.0030 | <0.0030 | <0.0030 | <0.0030 | <0.0030 |
| Hexavalent Chromium, total | mg/L | 0.0015 | - | <0.00150 | <0.00150 | <0.00150 | <0.00150 | <0.00150 | <0.00150 |
| **Dissolved Metals** | | | | | | | | | |
| Cadmium, dissolved (D-Cd) | mg/L | - | - | 0.000022 | 0.000022 | 0.000062 | <0.000020 | <0.000020 | 0.000077 |
| Copper, dissolved (D-Cu) | mg/L | - | - | 0.00078 | 0.00072 | 0.00058 | <0.00050 | 0.00050 | <0.00050 |
| Iron, dissolved (D-Fe) | mg/L | - | - | 0.014 | 0.022 | <0.010 | <0.010 | <0.010 | <0.010 |
| Lead, dissolved (D-Pb) | mg/L | - | - | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 |
| Manganese, dissolved (D-Mn) | mg/L | - | - | 0.0059 | 0.00509 | 0.00116 | 0.00581 | 0.00556 | 0.0025 |
| Nickel, dissolved (D-Ni) | mg/L | - | - | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 |
| Strontium, dissolved (D-Sr) | mg/L | - | - | 1.2 | 2.14 | 5.13 | 0.875 | 1.09 | 5.54 |
| Vanadium, dissolved (D-V) | mg/L | - | - | 0.00052 | 0.00068 | 0.00101 | <0.00050 | <0.00050 | 0.00107 |
| Zinc, dissolved (D-Zn) | mg/L | - | - | 0.0016 | 0.0016 | 0.0010 | <0.0010 | <0.0010 | <0.0010 |
| **Polycyclic Aromatic Hydrocarbons (PAHs)** | | | | | | | | | |
| Acenaphthene | mg/L | 0.006 | - | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 |
| Acridine | mg/L | - | - | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 |
| Anthracene | mg/L | - | - | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 |
| Benz(a)anthracene | mg/L | - | - | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 |
| Benzo(a)pyrene | mg/L | 0.00001 | - | <0.0000050 | <0.0000050 | <0.0000050 | <0.0000050 | <0.0000050 | <0.0000050 |
| Chrysene | mg/L | 0.0001 | - | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 |
| Fluoranthene | mg/L | - | - | 0.000021 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 |
| Fluorene | mg/L | 0.012 | - | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 |
| 1-methylnaphthalene | mg/L | 0.001 | - | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 |
| 2-methylnaphthalene | mg/L | 0.001 | - | <0.000010 | <0.000010 | <0.000010 | <0.000010 | 0.000011 | <0.000010 |
| Naphthalene | mg/L | 0.001 | - | <0.000050 | <0.000050 | <0.000050 | <0.000050 | <0.000050 | <0.000050 |
| Phenanthrene | mg/L | - | - | <0.000020 | 0.000023 | <0.000020 | <0.000020 | <0.000020 | <0.000020 |
| Pyrene | mg/L | - | - | 0.000014 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 |
| Quinoline | mg/L | - | - | <0.000050 | <0.000050 | <0.000050 | <0.000050 | <0.000050 | <0.000050 |
| **Volatile Organic Compounds (VOCs)** | | | | | | | | | |
| Benzene | mg/L | 0.11 | - | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 |
| Ethylbenzene | mg/L | 0.25 | - | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 |
| Methyl-tert-butyl-ether | mg/L | 5 | 0.44 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 |
| Styrene | mg/L | - | - | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 |
| Toluene | mg/L | 0.215 | - | <0.00040 | <0.00040 | <0.00040 | <0.00040 | <0.00040 | <0.00040 |
| Total Xylenes | mg/L | - | - | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 |
| Chlorobenzene | mg/L | 0.025 | - | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 |
| 1,2-Dichlorobenzene | mg/L | 0.042 | - | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 |

**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] The lowest applicable guidelines from approved or working BC WQGs, Canadian (CCME) WQGs and Federal WQGs.

[2] 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 not discharging, therefore the guidelines were not evaluated.

[3] The approved total ammonia nitrogen BC WQG is salinity, pH and temperature dependent; see Tables 26E and 26F in BC WQG guidance document.

[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. The Canadian WQG = 0.000016 mg/L.

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

| Parameter | Unit | Lowest Applicable Guideline [1] | | Reference Station WQR1 | | | Reference Station WQR2 | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | 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 |
| | | | | WQR1-0.5 | WQR1-2m | WQR1-SF | WQR2-0.5 | WQR2-2m | WQR2-SF |
| | | | | VA24C2208-001 | VA24C2208-002 | VA24C2208-003 | VA24C2208-004 | VA24C2208-005 | VA24C2208-006 |
| | | Long Term | Short Term | 2024-08-26 13:30 | 2024-08-26 13:50 | 2024-08-26 16:40 | 2024-08-26 13:36 | 2024-08-26 17:20 | 2024-08-26 17:40 |
| **General Parameters** | | | | | | | | | |
| pH - Field | pH units | 7.0 - 8.7 | - | -[6] | 8.1 | 7.5 | -[6] | ***6.7*** | 7.7 |
| Specific Conductivity - Field | µS/cm | - | - | -[6] | -[6] | -[6] | -[6] | -[6] | -[6] |
| Temperature - Field | ℃ | - | - | -[6] | -[6] | -[6] | -[6] | -[6] | -[6] |
| Salinity - Field | ppt | Narrative[2] | - | -[6] | -[6] | -[6] | -[6] | -[6] | -[6] |
| Turbidity - Field | NTU | Narrative[2] | Narrative[2] | -[6] | 9.73 | 2.08 | -[6] | 9.85 | 3.42 |
| TSS | mg/L | Narrative[2] | Narrative[2] | 7.9 | 2.8 | <2.0 | 3.4 | 4.3 | <2.0 |
| Dissolved Oxygen - Field | mg/L | >=8 | - | -[6] | -[6] | -[6] | -[6] | -[6] | -[6] |
| **Anions and Nutrients** | | | | | | | | | |
| Sulphate | mg/L | - | - | 315 | 1450 | 2370 | 867 | 187 | 2100 |
| Chloride | mg/L | - | - | 2450 | 10400 | 16900 | 6370 | 1550 | 15100 |
| Fluoride | mg/L | - | 1.5 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Ammonia (N-$NH_3$) | mg/L | Variable [3] | Variable [3] | <0.0050 | 0.0072 | <0.0050 | 0.0054 | 0.0078 | <0.0050 |
| Nitrite (N-$NO_2$) | mg/L | - | - | <0.10 | <0.10 | <0.10 | 0.1 | <0.10 | <0.10 |
| Nitrate (N-$NO_3$) | mg/L | 3.7 | 339 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 |
| **Total Metals** | | | | | | | | | |
| Aluminum, total (T-Al) | mg/L | - | - | 0.664 | 0.227 | 0.0258 | 0.178 | 0.472 | 0.0329 |
| Antimony, total (T-Sb) | mg/L | - | 0.27 [4] | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 |
| Arsenic, total (T-As) | mg/L | 0.0125 | 0.0125 | 0.00058 | 0.00117 | 0.00405 | 0.00061 | <0.00040 | 0.00362 |
| Barium, total (T-Ba) | mg/L | - | - | 0.0216 | 0.016 | 0.0116 | 0.0163 | 0.018 | 0.0125 |
| Beryllium, total (T-Be) | mg/L | 0.1 | - | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 |
| Boron, total (T-B) | mg/L | 1.2 | - | 0.62 | ***1.72*** | ***3.64*** | ***1.45*** | 0.32 | ***3.54*** |
| Cadmium, total (T-Cd) | mg/L | 0.00012 | - | <0.000020 | 0.000033 | 0.000079 | 0.000034 | <0.000020 | 0.000071 |
| Chromium, total (T-Cr) | mg/L | - | - | 0.00088 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 |
| Cobalt, total (T-Co) | mg/L | - | - | 0.000302 | 0.000168 | 0.000079 | 0.00013 | 0.000234 | 0.00008 |
| Copper, total (T-Cu) | mg/L | 0.002 | 0.003 | 0.00057 | <0.00050 | 0.00055 | 0.00073 | 0.00075 | 0.00071 |
| Iron, total (T-Fe) | mg/L | - | - | 0.529 | 0.193 | 0.028 | 0.142 | 0.38 | 0.033 |
| Lead, total (T-Pb) | mg/L | 0.002 | 0.14 | 0.00015 | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 |
| Manganese, total (T-Mn) | mg/L | - | - | 0.0206 | 0.00994 | 0.00375 | 0.00843 | 0.0176 | 0.00311 |
| Mercury, total (T-Hg) | mg/L | 0.000016 [5] | - | <0.0000050 | <0.0000050 | <0.0000050 | <0.0000050 | <0.0000050 | <0.0000050 |
| Molybdenum, total (T-Mo) | mg/L | - | - | 0.00177 | 0.0045 | 0.00882 | 0.00353 | 0.00107 | 0.00842 |
| Nickel, total (T-Ni) | mg/L | 0.0083 | - | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 |
| Selenium, total (T-Se) | mg/L | 0.002 | - | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 |
| Silver, total (T-Ag) | mg/L | 0.0015 | 0.003 | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 |
| Thallium, total (T-Tl) | mg/L | - | - | <0.000050 | <0.000050 | <0.000050 | <0.000050 | <0.000050 | <0.000050 |
| Uranium, total (T-U) | mg/L | - | - | 0.000494 | 0.0012 | 0.00276 | 0.00101 | 0.000263 | 0.00267 |
| Vanadium, total (T-V) | mg/L | 0.005 | - | 0.00187 | 0.00136 | 0.00128 | 0.00105 | 0.00131 | 0.00116 |
| Zinc, total (T-Zn) | mg/L | 0.01 | 0.055 | 0.0032 | <0.0030 | <0.0030 | <0.0030 | <0.0030 | <0.0030 |
| Hexavalent Chromium, total | mg/L | 0.0015 | - | <0.00150 | <0.00150 | <0.00150 | <0.00150 | <0.00150 | <0.00150 |
| **Dissolved Metals** | | | | | | | | | |
| Cadmium, dissolved (D-Cd) | mg/L | - | - | <0.000020 | 0.000051 | 0.000076 | 0.000024 | <0.000020 | 0.000056 |
| Copper, dissolved (D-Cu) | mg/L | - | - | <0.00050 | <0.00050 | <0.00050 | 0.00059 | <0.00050 | 0.00055 |
| Iron, dissolved (D-Fe) | mg/L | - | - | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| Lead, dissolved (D-Pb) | mg/L | - | - | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 |
| Manganese, dissolved (D-Mn) | mg/L | - | - | 0.00741 | 0.00294 | 0.00253 | 0.00456 | 0.00766 | 0.00202 |
| Nickel, dissolved (D-Ni) | mg/L | - | - | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 |
| Strontium, dissolved (D-Sr) | mg/L | - | - | 0.882 | 3.51 | 5.95 | 2.3 | 0.613 | 5.80 |
| Vanadium, dissolved (D-V) | mg/L | - | - | <0.00050 | 0.00087 | 0.00118 | 0.00063 | <0.00050 | 0.00115 |
| Zinc, dissolved (D-Zn) | mg/L | - | - | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 |
| **Polycyclic Aromatic Hydrocarbons (PAHs)** | | | | | | | | | |
| Acenaphthene | mg/L | 0.006 | - | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 |
| Acridine | mg/L | - | - | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 |
| Anthracene | mg/L | - | - | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 |
| Benz(a)anthracene | mg/L | - | - | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 |
| Benzo(a)pyrene | mg/L | 0.00001 | - | <0.0000050 | <0.0000050 | <0.0000050 | <0.0000050 | <0.0000050 | <0.0000050 |
| Chrysene | mg/L | 0.0001 | - | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 |
| Fluoranthene | mg/L | - | - | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 |
| Fluorene | mg/L | 0.012 | - | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 |
| 1-methylnaphthalene | mg/L | 0.001 | - | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 |
| 2-methylnaphthalene | mg/L | 0.001 | - | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 |
| Naphthalene | mg/L | 0.001 | - | <0.000050 | <0.000050 | <0.000050 | <0.000050 | <0.000050 | <0.000050 |
| Phenanthrene | mg/L | - | - | <0.000020 | <0.000020 | <0.000020 | <0.000020 | <0.000020 | <0.000020 |
| Pyrene | mg/L | - | - | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 |
| Quinoline | mg/L | - | - | <0.000050 | <0.000050 | <0.000050 | <0.000050 | <0.000050 | <0.000050 |
| **Volatile Organic Compounds (VOCs)** | | | | | | | | | |
| Benzene | mg/L | 0.11 | - | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 |
| Ethylbenzene | mg/L | 0.25 | - | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 |
| Methyl-tert-butyl-ether | mg/L | 5 | 0.44 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 |
| Styrene | mg/L | - | - | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 |
| Toluene | mg/L | 0.215 | - | <0.00040 | <0.00040 | <0.00040 | <0.00040 | <0.00040 | <0.00040 |
| Total Xylenes | mg/L | - | - | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 |
| Chlorobenzene | mg/L | 0.025 | - | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 |
| 1,2-Dichlorobenzene | mg/L | 0.042 | - | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 |

**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] The lowest applicable guidelines from approved or working BC WQGs, Canadian (CCME) WQGs and Federal WQGs.
[2] 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 not discharging, therefore the guidelines were not evaluated.
[3] The approved total ammonia nitrogen BC WQG is salinity, pH and temperature dependent; see Tables 26E and 26F in BC WQG guidance document.
[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. The Canadian WQG = 0.000016 mg/L.
[6] Complete records of field measurements are not available due to a field probe malfunction.

## Table F-3: Summary of Marine Water Quality Results Received at the Time of Reporting

| Parameter | Unit | Lowest Applicable Guideline [1] | | 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 |
| | | | | VA24C2988-001 | VA24C2988-002 | VA24C2988-003 | VA24C2988-004 | VA24C2988-005 | VA24C2988-006 |
| | | Long Term | Short Term | 2024-09-04 12:35 | 2024-09-04 12:37 | 2024-09-04 12:40 | 2024-09-04 13:39 | 2024-09-04 13:45 | 2024-09-04 13:54 |
| **General Parameters** | | | | | | | | | |
| pH - Field | pH units | 7.0 - 8.7 | - | 8.0 | 7.9 | 7.5 | 7.1 | 8.0 | 7.5 |
| Specific Conductivity - Field | µS/cm | - | - | 12054 | 28871 | 31876 | 11468 | 28887 | 31678 |
| Temperature - Field | ℃ | - | - | 15.2 | 15.4 | 11.1 | 16 | 15.2 | 9.9 |
| Salinity - Field | ppt | Narrative[2] | - | 8.65 | 22.32 | 27.88 | 8.04 | 22.43 | 28.63 |
| Turbidity - Field | NTU | Narrative[2] | Narrative[2] | 6.17 | 1.63 | 1.71 | 8.69 | 1.5 | 1.34 |
| TSS | mg/L | Narrative[2] | Narrative[2] | 8.9 | 5.1 | 17.9 | 10.5 | 5.1 | <2.0 |
| Dissolved Oxygen - Field | mg/L | >=8 | - | 9.99 | 9.42 | ***6.71*** | 10.26 | 9.31 | ***5.64*** |

**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] The lowest applicable guidelines from approved or working BC WQGs, Canadian (CCME) WQGs and Federal WQGs.

[2] 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 not discharging, therefore the guidelines were not evaluated.

## Table F-4: Summary of Marine Water Quality Results Received at the Time of Reporting

| Parameter | Unit | Lowest Applicable Guideline [1] | | 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 |
| | | | | VA24C3785-001 | VA24C3785-002 | VA24C3785-003 | VA24C3785-004 | VA24C3785-005 | VA24C3785-006 |
| | | Long Term | Short Term | 2024-09-09 12:15 | 2024-09-09 12:35 | 2024-09-09 13:00 | 2024-09-10 8:04 | 2024-09-10 8:48 | 2024-09-10 8:59 |
| **General Parameters** | | | | | | | | | |
| pH - Field | pH units | 7.0 - 8.7 | - | 7.9 | 7.9 | 7.6 | ***6.8*** | 8.0 | 7.5 |
| Specific Conductivity - Field | µS/cm | - | - | 162.7 | 21998 | 32168 | 5356 | 23421 | 31794 |
| Temperature - Field | ℃ | - | - | 14.6 | 15.4 | 11.4 | 13.5 | 15.4 | 9.6 |
| Salinity - Field | ppt | Narrative[2] | - | 0.1 | 16.55 | 27.93 | 3.79 | 17.75 | 28.95 |
| Turbidity - Field | NTU | Narrative[2] | Narrative[2] | 7.16 | 4.35 | 2.67 | 10.14 | 2.87 | 2 |
| TSS | mg/L | Narrative[2] | Narrative[2] | 7.3 | 5.5 | 3.7 | 5.7 | 3.4 | <2.0 |
| Dissolved Oxygen - Field | mg/L | >=8 | - | 10.51 | 9.69 | ***6.40*** | 10.32 | 9.80 | ***5.19*** |
| **Anions and Nutrients** | | | | | | | | | |
| Sulphate | mg/L | - | - | 419 | 801 | 1400 | 232 | 1340 | 2340 |
| Chloride | mg/L | - | - | 3230 | 6020 | 10300 | 1870 | 9870 | 17000 |
| Fluoride | mg/L | - | 1.5 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | 1.1 |
| Ammonia (N-$NH_3$) | mg/L | Variable [3] | Variable [3] | 0.0097 | 0.0074 | 0.0073 | 0.0062 | 0.0106 | <0.0050 |
| Nitrite (N-$NO_2$) | mg/L | - | - | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Nitrate (N-$NO_3$) | mg/L | 3.7 | 339 | 0.54 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 |
| **Total Metals** | | | | | | | | | |
| Aluminum, total (T-Al) | mg/L | - | - | 0.208 | 0.126 | 0.108 | 0.263 | 0.0475 | 0.0315 |
| Antimony, total (T-Sb) | mg/L | - | 0.27 [4] | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 |
| Arsenic, total (T-As) | mg/L | 0.0125 | 0.0125 | 0.0012 | 0.0016 | 0.00263 | 0.00058 | 0.00261 | 0.00373 |
| Barium, total (T-Ba) | mg/L | - | - | 0.0138 | 0.0133 | 0.0134 | 0.0147 | 0.0117 | 0.0109 |
| Beryllium, total (T-Be) | mg/L | 0.1 | - | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 |
| Boron, total (T-B) | mg/L | 1.2 | - | 0.74 | ***1.50*** | ***2.37*** | 0.48 | ***2.78*** | ***4.08*** |
| Cadmium, total (T-Cd) | mg/L | 0.00012 | - | <0.000020 | 0.000037 | 0.000041 | <0.000020 | 0.000041 | 0.000088 |
| Chromium, total (T-Cr) | mg/L | - | - | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 |
| Cobalt, total (T-Co) | mg/L | - | - | 0.000122 | 0.000103 | 0.000102 | 0.000149 | 0.000074 | 0.000084 |
| Copper, total (T-Cu) | mg/L | 0.002 | 0.003 | 0.00098 | 0.00052 | 0.00055 | 0.00118 | 0.0013 | 0.00143 |
| Iron, total (T-Fe) | mg/L | - | - | 0.187 | 0.121 | 0.106 | 0.224 | 0.043 | 0.041 |
| Lead, total (T-Pb) | mg/L | 0.002 | 0.14 | 0.00024 | <0.00010 | <0.00010 | 0.00021 | 0.00035 | 0.00059 |
| Manganese, total (T-Mn) | mg/L | - | - | 0.0113 | 0.00864 | 0.0072 | 0.0125 | 0.00439 | 0.00401 |
| Mercury, total (T-Hg) | mg/L | 0.000016 [5] | - | <0.0000050 | <0.0000050 | <0.0000050 | <0.0000050 | <0.0000050 | <0.0000050 |
| Molybdenum, total (T-Mo) | mg/L | - | - | 0.00176 | 0.00298 | 0.00548 | 0.00118 | 0.00578 | 0.00846 |
| Nickel, total (T-Ni) | mg/L | 0.0083 | - | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 |
| Selenium, total (T-Se) | mg/L | 0.002 | - | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | 0.00056 |
| Silver, total (T-Ag) | mg/L | 0.0015 | 0.003 | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 |
| Thallium, total (T-Tl) | mg/L | - | - | <0.000050 | <0.000050 | <0.000050 | <0.000050 | <0.000050 | <0.000050 |
| Uranium, total (T-U) | mg/L | - | - | 0.00048 | 0.000909 | 0.00169 | 0.000376 | 0.00185 | 0.00278 |
| Vanadium, total (T-V) | mg/L | 0.005 | - | 0.00091 | 0.00091 | 0.00124 | 0.00098 | 0.00099 | 0.00125 |
| Zinc, total (T-Zn) | mg/L | 0.01 | 0.055 | <0.0030 | <0.0030 | <0.0030 | <0.0030 | <0.0030 | <0.0030 |
| Hexavalent Chromium, total | mg/L | 0.0015 | - | <0.00150 | <0.00150 | <0.00150 | <0.00150 | <0.00150 | <0.00150 |
| **Dissolved Metals** | | | | | | | | | |
| Cadmium, dissolved (D-Cd) | mg/L | - | - | <0.000020 | 0.000027 | 0.00002 | <0.000020 | 0.000031 | 0.000076 |
| Copper, dissolved (D-Cu) | mg/L | - | - | <0.00050 | <0.00050 | <0.00050 | 0.00473 | 0.00096 | 0.00076 |
| Iron, dissolved (D-Fe) | mg/L | - | - | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| Lead, dissolved (D-Pb) | mg/L | - | - | <0.00010 | <0.00010 | <0.00010 | 0.00025 | 0.00018 | 0.00045 |
| Manganese, dissolved (D-Mn) | mg/L | - | - | 0.00643 | 0.00535 | 0.00553 | 0.00687 | 0.00439 | 0.00241 |
| Nickel, dissolved (D-Ni) | mg/L | - | - | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 |
| Strontium, dissolved (D-Sr) | mg/L | - | - | 0.979 | 1.85 | 1.71 | 0.687 | 2.65 | 5.70 |
| Vanadium, dissolved (D-V) | mg/L | - | - | 0.0005 | 0.00055 | 0.0006 | <0.00050 | 0.00072 | 0.00114 |
| Zinc, dissolved (D-Zn) | mg/L | - | - | <0.0010 | <0.0010 | <0.0010 | 0.0027 | <0.0010 | <0.0010 |
| **Polycyclic Aromatic Hydrocarbons (PAHs)** | | | | | | | | | |
| Acenaphthene | mg/L | 0.006 | - | <0.000010 | <0.000010 | <0.000010 | 0.000021 | 0.00001 | <0.000010 |
| Acridine | mg/L | - | - | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 |
| Anthracene | mg/L | - | - | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 |
| Benz(a)anthracene | mg/L | - | - | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 |
| Benzo(a)pyrene | mg/L | 0.00001 | - | <0.0000050 | <0.0000050 | <0.0000050 | <0.0000050 | <0.0000050 | <0.0000050 |
| Chrysene | mg/L | 0.0001 | - | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 |
| Fluoranthene | mg/L | - | - | <0.000010 | <0.000010 | <0.000010 | 0.000015 | <0.000010 | <0.000010 |
| Fluorene | mg/L | 0.012 | - | <0.000010 | <0.000010 | <0.000010 | 0.00002 | <0.000010 | <0.000010 |
| 1-methylnaphthalene | mg/L | 0.001 | - | <0.000010 | <0.000010 | <0.000010 | 0.000015 | 0.000014 | <0.000010 |
| 2-methylnaphthalene | mg/L | 0.001 | - | 0.000017 | 0.000012 | <0.000010 | 0.000024 | 0.000025 | 0.000011 |
| Naphthalene | mg/L | 0.001 | - | <0.000050 | <0.000050 | <0.000050 | 0.000053 | <0.000050 | <0.000050 |
| Phenanthrene | mg/L | - | - | <0.000020 | <0.000020 | <0.000020 | 0.000035 | <0.000020 | <0.000020 |
| Pyrene | mg/L | - | - | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 |
| Quinoline | mg/L | - | - | <0.000050 | <0.000050 | <0.000050 | <0.000050 | <0.000050 | <0.000050 |
| **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] The lowest applicable guidelines from approved or working BC WQGs, Canadian (CCME) WQGs and Federal WQGs.
[2] 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.
[3] The approved total ammonia nitrogen BC WQG is salinity, pH and temperature dependent; see Tables 26E and 26F in BC WQG guidance document.
[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. The Canadian WQG = 0.000016 mg/L.