TECHNICAL MEMORANDUM

INTERNAL

To:	**Ian McAllister, Ashleigh Crompton, Mike Champion, Jackie Boruch and Ryan Schucroft (Woodfibre LNG)**	**Date:**	**7 July 2024**
From:	**Holly Pelletier and Patrick Mueller (Lorax)**	**Project #:**	**A633-7**
Subject:	**PE-111578 Weekly Discharge and Compliance Report #20 for June 23 – 29**		

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

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

This technical memorandum (Report #20) was prepared by Lorax Environmental and summarizes monitoring conducted the week of June 23 – 29 for contact waters directed to a WWTP or a sedimentation pond. Monitoring data and pending results from prior reporting periods available at the time of reporting are tabulated and included as appendices. Figures referenced in the report discussion are presented after Section 5. Report #20 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 report. Sedimentation pond photographs are included in Appendix A, and monitoring results are tabulated in Appendix B through Appendix G 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, bedrock excavation and sedimentation pond and WWTP construction. Shoring works along the shoreline and foreshore areas were initiated in December 2023, and in early 2024 construction of water management infrastructure was initiated and has continued through the June 23 – 29 monitoring period. The East WWTP, and East and West sedimentation ponds have been completed, and the West WWTP is ready for commissioning. The PE- 111578 water management facilities that are completed or were under construction during the reporting period are shown in Figure 1.

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

A revised schedule is being developed to complete the installation of the East Sedimentation Pond permanent outfall structure. Until those structures are constructed, 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 complete, except for the outfall structure, and has not been commissioned for discharge. The schedule for completion of the pond outfall structure is being revised. The West WWTP has been partially assembled and commissioning of the WWTP is planned for mid-July with the commencement of pilot trials.

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

The weather was variable during the monitoring period (June 23 – 29) with precipitation recorded each day except June 25 at the on-site weather station (<15 mm per day). 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
06/23/2024	5.3	16.8	12.7	Overcast, Rain
06/24/2024	1.4	19.8	11.6	Partly Cloudy
06/25/2024	0.0	22.7	11.0	Partly Cloudy
06/26/2024	4.6	17.8	13.3	Overcast
06/27/2024	13.2	15.0	12.5	Overcast, Rain
06/28/2024	1.2	17.8	11.8	Partly Cloudy
06/29/2024	0.8	18.9	13.2	Sun

Pilot testing of the East WWTP continued during the monitoring period (June 23 – 29). Contaminated and potentially contaminated contact waters from baker tanks located near the East Sedimentation Pond and excavations within the East Catchment (Excavation Areas 1100 and 1200) and the West Catchment (Hydrovac dump dewatering) were directed to the East WWTP for treatment, as well as water recirculated from the East Sedimentation Pond and water transferred from the West Sedimentation Pond. The contact water source areas are shown in Figure 2 and Figure 3 in Appendix A. A total of 3,673 m^3 of treated WWTP effluent was discharged to the East Sedimentation Pond during the reporting period (June 23 – 29). Daily WWTP effluent flows are provided in Appendix C (Table C-2).

There were no discharges from the East and West Sedimentation Ponds during the monitoring period (June 23 – 29), except on June 23. The East Sedimentation Pond discharged intermittently during dayshift on June 22 and the June 22/23 nightshift, with the latter reported as discharge on June 23. Discharge that occurred June 22 during dayshift, and water quality monitoring results for this discharge, were included in Report #19. A total of 675 m^3 is reported as discharge on June 23, with the entire amount discharged during the June 22/23 nightshift. Daily effluent flows are provided in Appendix B (Table B-3). Photographs of the ponds are included in Appendix A (Figure 4 and Figure 5).

2. Monitoring Summary

The PE-111578 authorized works were under construction during the June 23 – 29 monitoring period. Compliance monitoring stations are progressively established by as water management infrastructure is completed. Monitoring is conducted by the on-site Environmental Monitors (Roe Environmental). Analytical samples are submitted by Roe Environmental to ALS Environmental in Burnaby, BC, for testing.

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

- Creek water (SW-01, SW-02, SW-03, SW-04, SW-07).
- Howe Sound reference and IDZ locations (WQR1, WQR2, IDZ-E1 and IDZ-E2).

- Non-contact diversion ditch outlets (OUT-01, OUT-02, OUT-06, and OUT-11).
- Contact water monitoring locations (WWTP-E-IN, WWTP-E-OUT, SP-E-IN-2, SP-E-OUT, SP-E-NE, and SP-E-NW).

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.

Stations SW-01, SW-02, SW-03, SW-04, SW-07, OUT-02, WWTP-E-IN, WWTP-E-OUT, SP-E-NE, and SP-E-NW were monitored during the monitoring period (June 23 – 29). Sampling dates and parameters tested are summarized in Table 2.

Overall, the PE-111578 monitoring requirements that were applicable during the monitoring period (June 23 – 29) were met. However, field parameters and analytical samples were not collected at station SP-E-IN-2, the East Sedimentation Pond non-contaminated contact water influent station. The pond did not receive contact water inflows, therefore daily field parameters and a weekly analytical sample were not collected at station SP-E-IN-2. Field parameters and analytical samples were not collected at station SP-E-OUT, the East Sedimentation Pond discharge compliance point, as the pond did not discharge during the monitoring period (June 23 – 29), except during the June22/23 nightshift, with the nightshift flows reported as June 23 discharge. Field parameters and an analytical sample was collected on June 22 that represents the June 22/23 intermittent discharge and is discussed in Weekly Report #19.

Table 2: Summary of PE-111578 monitoring samples collected June 23 – 29.

Sampling Date	Sample	Description	Parameters Tested	Monitoring Frequency
June 23, 2024	WWTP-E-OUT	East WWTP effluent	Field Parameters.	D
	WWTP-E-IN	East WWTP influent		
June 24, 2024	WWTP-E-OUT	East WWTP effluent	Field Parameters.	D
	WWTP-E-IN	East WWTP influent		
June 25, 2024	SP-E-NE [1]	East Sedimentation Pond, in-pond sample, represents effluent quality	Field and Physical Parameters, EPHs & PAHs, Total, Dissolved and Speciated Metals.	D, W_1, P
	SP-E-NW	East Sedimentation Pond, in-pond sample		
	WWTP-E-OUT	East WWTP effluent	Field, Physical & General Parameters, VH & BTEX, EPHs & PAHs, Total, Dissolved and Speciated Metals, VOCs, Dioxins and Furans.	D, W_1, P
	WWTP-E-IN	East WWTP influent (from Baker Tank 1)		
		East WWTP influent (from Baker Tank 2)		
		East WWTP influent, Cell 4 of East Sedimentation Pond	Field Parameters.	D
June 26, 2024	SP-E-NE [1]	East Sedimentation Pond, in-pond sample, represents effluent quality	Field Parameters.	D
	WWTP-E-OUT	East WWTP effluent		
	WWTP-E-IN	East WWTP influent		
	SW-01	Lower Reach of Woodfibre Creek (near the mouth)	Field, Physical & General Parameters, VH & BTEX, EPHs & PAHs, Total, Dissolved and Speciated Metals, VOCs, Dioxins and Furans, Methylmercury. SW-04 was also tested for Glycols, Oil and Grease.	M
	SW-04	Lower Reach of East Creek (near the outlet to the outfall culvert)		
	SW-07	Upstream Mill Creek (at the diversion inlet)		
	OUT-02	Non-Contact Water Diversion Ditch Outlet	Field, Physical & General Parameters, Total, Dissolved and Speciated Metals, and Methylmercury.	
June 27, 2024	SP-E-NE [1]	East Sedimentation Pond, in-pond sample, represents effluent quality	Field Parameters.	D
	WWTP-E-OUT	East WWTP effluent		
	WWTP-E-IN	East WWTP influent		
	SW-02	Upper Reach of Mill Creek (upstream of the third bridge)	Field, Physical & General Parameters, VH & BTEX, EPHs & PAHs, Total, Dissolved and Speciated Metals, VOCs, Dioxins and Furans, and Methylmercury.	M
	SW-03	Lower Reach of Mill Creek (near the mouth, in the estuarine zone)		
June 28, 2024	SP-E-NE [1]	East Sedimentation Pond, in-pond sample, represents effluent quality	Field Parameters.	D
	WWTP-E-OUT	East WWTP effluent		
	WWTP-E-IN	East WWTP influent		
June 29, 2024	SP-E-NE [1]	East Sedimentation Pond, in-pond sample, represents effluent quality	Field Parameters.	D
	WWTP-E-OUT	East WWTP effluent		
	WWTP-E-IN	East 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 – spring and fall high frequency sampling for all parameters receiving environment stations (5 samples collected over a 30 day period).
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.

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 and PE-111578 discharge limits. The screening results are discussed and items outside the screening criteria are also summarized in the Section 4 tracking table (Table 5).

All water quality results 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 useful for water quality characterization.

Federal and Provincial Water Quality Guidelines (WQG) are not specified for dioxins and furans. The general term "dioxins and furans" refers to a grouping of hundreds of individual compounds with similar chemical composition and properties. To simplify result presentation and interpretation, the results of individual compounds are converted to a total toxic equivalent (TEQ) value and are summed to produce single TEQ values for each sample by the laboratory. Consistent with the pre-construction monitoring program, a lower-bound TEQ value is reported. The lower-bound TEQ is calculated assuming a concentration of zero for results reported as not detected, therefore, if individual compounds are not detected the TEQ will equal zero.

3.2 Summary of Reported Results

Field measurements and analytical results for the monitoring period (June 23 – 29) that were available at the time of reporting are listed below in Table 3. Analytical results not available at the time of reporting will be included in future weekly reports when available for the following samples:

- SW-01, SW-04, and SW-07 collected June 26 (only field results available)
- OUT-02 collected June 26 (only field results available)
- SW-02 and SW-03 collected June 27 (only field results available)

Results dioxins and furans are pending for the following samples and will be included in future weekly reports when available:

- WWTP-E-IN and WWTP-E-OUT collected June 25 (dioxins and furans)

Methylmercury analytical results for samples collected May 26 – 28 and described in Weekly Report #16 and for the SP-E-OUT sample collected June 22 were available at the time of reporting.

Dioxins and furans analytical results for samples collected May 26 – 28 and described in Weekly Report #16 were also available at the time of reporting.

Table 3: Summary of Analytical Results Included in Weekly Discharge and Compliance Report #20.

Sample	Description	Sampling Date	Parameters Reported
SW-02	Upper Reach of Mill Creek (upstream of the third bridge)	May 26, 2024	Methylmercury, Dioxins and Furans.
SW-03	Lower Reach of Mill Creek (near the mouth, in the estuarine zone)		
SW-04	Lower Reach of East Creek (near the outlet to the outfall culvert)		
SW-07	Upstream Mill Creek (at the diversion inlet)		
SW-01	Lower Reach of Woodfibre Creek (near the mouth)	May 27, 2024	Methylmercury, Dioxins and Furans.
OUT-02	Non-Contact Water Diversion Ditch Outlet		
IDZ-E1-0.5	Howe Sound IDZ station E1; 0.5 m below surface	May 28, 2024	Methylmercury, Dioxins and Furans.
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.		
WQR1-2m	Reference site 1; 2 m below surface.		
WQR1-SF	Reference site 1; 2 m above the seafloor.		
SP-E-OUT	East Sedimentation Pond effluent (compliance point)	June 22, 2024	Methylmercury.
SP-E-NE	East Sedimentation Pond, in-pond sample, represents effluent quality	June 25, 2024	Field and Physical Parameters, Total and Dissolved Metals, Hexavalent Chromium, PAHs.
SP-E-NW	East Sedimentation Pond, in-pond sample, represents influent quality		Physical Parameters, Total and Dissolved Metals, Hexavalent Chromium, PAHs.
WWTP-E-OUT	East WWTP effluent		Field, Physical and General Parameters, Total and Dissolved Metals, Hexavalent Chromium, PAHs, and VOCs.
WWTP-E-IN (at Baker Tank 1)	East WWTP influent, Baker Tank 1		
WWTP-E-IN (at Baker Tank 2)	East WWTP influent, Baker Tank 2		

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 BC, Canadian and Federal water quality guidelines (WQGs) for the protection of marine water aquatic life. Influent water is not discharged from site, therefore only effluent water quality is assessed for exceedances. The analytical results, daily field parameters, discharge limits and WQGs are summarized in Table B-1 and Table B-2 (analytical results) and Table B-3 (field measurements) of Appendix B.

During the monitoring period (June 23 – 29), 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 discharged intermittently during dayshift on June 22 and continuing overnight until June 23. Field measurements and analytical results that represents the June22/23 discharge event are described in Report #19.

The East Sedimentation Pond did not discharge June 24 – 29, therefore daily field measurements were not collected at compliance station SP-E-OUT. Daily field measurements collected June 25 – 29 at the in-pond station (SP-E-NE, proximal to SP-E-OUT) met PE-111578 discharge limits for pH. Dissolved oxygen ranged from 5.41 to 7.25 outside the lower WQG limit (>= 8.0 mg/L). Reported results for analytical samples collected June 25 at station SP-E-NE and SP-E-NW met PE- 111578 discharge limits and WQGs for parameters without discharge limits, except dissolved oxygen as noted above.

Methylmercury analytical results were available at the time of reporting for the June 22 sample at the East Sedimentation Pond discharge point (SP-E-OUT) discussed in Weekly Report #19. The methylmercury concentration at SP-E-OUT was <0.000080 µg/L on June 22. The detection limit was raised for total methylmercury due to a high bias observed in the associated laboratory control sample (Table 5).

3.4 East Wastewater Treatment Plant

The East WWTP influent and effluent results are screened against the minimum discharge objectives (MDOs) which the WWTP was designed to meet. Contaminated contact water is directed to the WWTP influent, and it is expected that influent water is unlikely to meet MDOs, therefore only effluent water quality is assessed for exceedances. The analytical results, daily field measurements, and MDOs are summarized in Table C-1 (analytical results) and Table C-2 (field measurements) of Appendix C. Screening results are summarized in Table 4 for parameter concentrations that do not meet MDOs.

The East WWTP received contact water and recirculated East Sedimentation Pond water each day June 23 – 29 (Section 2). 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 and effluent stations, WWTP-E-IN and WWTP-E-OUT, respectively. Analytical samples (WWTP-E-IN-Baker 1 and WWTP-E-IN-Baker 2) were collected from two baker tanks used as sumps for site contact water. Water from these tanks was directed to WWTP influent. An analytical sample of treated effluent was collected from station WWTP-E-OUT on June 25.

Field measurements of pH at East WWTP influent (station WWTP-E-IN) collected June 23 – 29 ranged from pH 6.9 to 7.7, dissolved oxygen ranged from 5.20 to 7.94 mg/L and turbidity readings ranged from 2.37 to 44.4 NTU. The field measurements met the MDOs for pH, except on June 24 when pH (6.9) was outside the lower MDO criteria (7.0 – 8.7). Field measurements for dissolved oxygen were below the lower limit of the MDO (≥ 8 mg/L) in all samples collected at the influent station during the monitoring period.

Field pH, turbidity and dissolved oxygen in East WWTP effluent samples (station WWTP-E-OUT) ranged from pH 6.6 to 7.2, 0.28 to 6.32 NTU and 1.21 to 7.97 mg/L, respectively (Appendix C, Table C-3). The effluent field measurements met the MDOs for pH, on June 25 and 26 (pH 6.7 and 6.6, respectively). Field measurements for dissolved oxygen did not meet the MDO (≥ 8 mg/L) in all samples collected from the effluent station during the monitoring period. Pilot testing of the East WWTP is underway and the deviations in pH are attributed to WWTP process adjustments during the monitoring period. Deviations from MDOs are expected to occasionally occur during the East WWTP pilot trial.

An analytical sample of East WWTP effluent (station WWTP-E-OUT) was collected June 25 and tested for all parameters under PE-111578 except methylmercury (Table 2). The results met MDOs, except for total vanadium (Table 4). The total vanadium concentration (0.0053 mg/L) was 1.06 times greater than the MDO (0.005 mg/L) in the sample from WWTP-E-OUT collected on June 25 and is primarily attributed to the soluble forms of the metal present in the sample.

Table 4:
Summary of MDO Exceedances for the East WWTP at Effluent Station WWTP-E-OUT.

Parameter	Units	MDO	N	N >MDO	Commentary
Field pH	s.u.	7.0-8.7	7	2	Field pH was below the lower limit of the MDO on June 25 (pH 6.7) and June 26 (pH 6.6). Process adjustments are underway and occasional deviations from MDOs may occur during the pilot period.
Field Dissolved Oxygen (DO)	mg/L	>=8	7	7	Field DO was below the lower limit MDO for DO in the field measurement collected from WWTP-E-OUT for all samples collected during the monitoring period. Process adjustments are underway and occasional deviations from MDOs may occur during the pilot period.
Total Vanadium	mg/L	0.005	1	1	The total vanadium concentration was 1.06 times greater than the MDO in the sample from WWTP-E-OUT collected June 22 (0.00530 mg/L). Additional process adjustments are under development to improve the removal of vanadium.

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

3.5 Non-Contact Water Diversion Ditch Outlets

Water quality results for non-contact water are screened against BC, Canadian and Federal WQGs for the protection of freshwater aquatic life. The analytical results, field parameters and WQGs are summarized in Appendix D.

Methylmercury analytical results were available at the time of reporting for the May 27 sample discussed in Weekly Report #16 for non-contact water diversion ditch outlet station OUT-02. The methylmercury concentration was 0.000025 µg/L and is within the range observed in the pre-construction baseline monitoring program for freshwater creeks within the CPA.

3.6 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. The analytical results, field parameters and WQGs are summarized in Appendix E and Appendix F for freshwater and estuarine water, respectively.

Dioxins and furans analytical results were available at the time of reporting for the May 26 – 27 samples discussed in Weekly Report #16 for freshwater and estuarine water receiving environment stations. The lower bound PCDD/F TEQ ranged from 0.00920 to 0.115 pg/L in freshwater samples from Woodfibre Creek (SW-01), Mill Creek (SW-02 and SW-07), and East Creek (SW- 04). The lower bound PCDD/F TEQ in the estuarine lower reach of Mill Creek (SW-03) was 0 pg/L. The reported concentrations of dioxins and furans compounds observed in the freshwater and estuarine water samples are within the concentration ranges observed in the pre-construction baseline monitoring program.

Methylmercury analytical results were available at the time of reporting for the May 26 – 27 samples discussed in Weekly Report #16 for freshwater and estuarine water receiving environment stations. Methylmercury concentrations were <0.000020 µg/L in the freshwater samples from Woodfibre Creek (SW-01) and Mill Creek (SW-02 and SW-07), and 0.000068 µg/L in East Creek (SW- 04). The methylmercury concentration in the estuarine lower reach of Mill Creek (SW-03) was 0.000022 µg/L. Methylmercury concentrations are within the ranges observed in the pre-construction baseline monitoring program.

3.7 Marine Water Receiving Environment

Marine water receiving environment samples are screened against BC, Canadian and Federal 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 G.

Dioxins and furans analytical results were available at the time of reporting for the May 28 samples discussed in Weekly Report #16 for marine receiving environment stations IDZ-E1, IDZ-E2, and WQR1 at 0.5 and 2 m below the water surface and 2 m above the seafloor. The lower bound PCDD/F TEQ concentration ranged from 0 to 0.00105 pg/L at station IDZ-E1, 0.0407 to 0.0714 pg/L at station IDZ-E2 and ranged from 0.000690 to 0.0228 pg/L at reference station WQR1. The reported concentrations of dioxins and furans compounds observed in the marine water samples are within the concentration ranges observed in the pre-construction baseline monitoring program.

Methylmercury analytical results were available at the time of reporting for the May 28 samples discussed in Weekly Report #16 for marine receiving environment stations IDZ-E1, IDZ-E2, and WQR1. Methylmercury concentrations were <0.000020 µg/L in all marine receiving environment samples except at 0.5 m below surface at IDZ-E1 where methylmercury was measured at 0.000021 µg/L. The methylmercury values observed in the marine water samples are within the concentrations ranges observed in the pre-construction baseline monitoring program.

4. Quality Control

This section presents the results of the quality control (QC) evaluation for the PE-111578 weekly report (Table 5). The evaluation includes a review of field and lab QC, completeness of the weekly report (*i.e.,* pending data), completeness of the monitoring program, confirmation of recordkeeping, evaluation of compliance and review of water management activities. Any items flagged for follow-up in Table 5, and open items from the exceedance tables in Section 3 will be carried forward in future reports until they are closed.

Table 5: Weekly Report QC Evaluations and Ongoing Items

QC Procedure	Observation	Investigation/Resolution
Reporting Period (June 23 – 29, Report #20)		
Monitoring Program Evaluation	PE-111578 contact water, non-contact water and initial dilution zone monitoring stations have not been fully established.	The PE-111578 authorized works were under construction during the reporting period. Monitoring stations are progressively established as water management infrastructure is completed. The East Sedimentation Pond and East WWTP are completed, and pilot testing of the East WWTP is ongoing. The East Sedimentation Pond was commissioned for discharge on April 15. The West Sedimentation Pond is complete, except the outfall structure and West WWTP is under construction. The West Sedimentation Pond is not commissioned for discharge and did not discharge. The non-contact water diversion ditch that discharges at station OUT-06 has been commissioned, and stations for pre-existing outfalls OUT-01, OUT-02, and OUT-11 have also been established.
Monitoring Program Evaluation	The monitoring records collected since commissioning of the East WWTP and East Sedimentation Pond are being reviewed regarding frequency and parameters tested.	Monitoring records from commissioning of the East Sedimentation Pond for discharge (April 14) to the end of Report #20 monitoring period (June 29) were reviewed. Overall, samples were collected from the established monitoring stations at the PE-111578 required frequencies (i.e., daily, weekly, monthly and quarterly) and tested for the required parameters. • The PE-111578 specified sampling frequencies were not met at East Sedimentation Pond influent and effluent stations SP-E-IN-2 and SP-E-OUT, primarily for daily and weekly monitoring at the sedimentation pond. Flows at these stations were infrequent and samples were only collected when there were flows at the time of monitoring. • The PE-111578 specified weekly and monthly sampling frequencies were not met at clean water diversion ditch outlets (stations OUT-01, OUT-02, OUT-06 and OUT-11. Flows at these stations were infrequent and samples were only collected when there were flows at the time of monitoring. • High frequency monitoring samples (*i.e.,* first five weeks and 5-in-30 sampling) at sedimentation pond, WWTP and receiving environment stations were generally not collected over 5 consecutive weeks, there is a one week gap for most stations such that 5 samples were collected over 6 weeks. The "first five weeks" and "5-in-30" monitoring periods partially overlap therefore the same samples apply to both monitoring frequencies. • In some instances, samples were tested for a partial parameter list instead of the full list. This was resolved early June but required further review with site staff. • Marine reference station WQR2 was overlooked for two of the weekly sampling events. This was resolved early June. These findings will be reviewed with site Environmental Monitors to: 1) Refine monitoring strategies at stations where there are infrequent flows, if possible, to ensure required samples are collected at the specified frequencies. 2) Confirm that tests requested for the PE-111578 required samples include all specified parameters. This item remains open.
Data QC	The detection limit for total methyl mercury was raised for the SP-E-OUT sample collected June 22.	The detection limit reported for total methyl mercury in the June 22 SP-E-OUT sample was raised by the laboratory to <0.000080 ug/L, 4 times higher than the typically reported detection limit (<0.000020 µg/L). The lab indicates this was due to an analytical interference detected in the lab QC samples that required adjustment to reporting limit. This item is closed.
Pending Data	Dioxin and furan results for samples collected June 25 were not reported.	Dioxins and furans results were not complete at the time of reporting. Testing of these parameters typically requires up to 4 weeks to complete. The pending results are expected in early August. This item remains open.
	Analytical results for samples collected June 26 – 27 were not reported.	Analytical results for freshwater receiving environment samples collected June 26-27 were not available at the time of reporting. The pending results are expected to be available for the next reporting period. This item remains open.
Ongoing Items from Previous Weekly Reports		
Report #13: WWTP Performance Evaluation	The May 6 monitoring results for East WWTP indicate dissolved vanadium was not being removed by the treatment process.	Sampling conducted since May 6 indicates vanadium in treated WWTP effluent is almost entirely in soluble form, suggesting this form of vanadium is only partially treated, resulting in residual vanadium concentrations in the treated effluent that are generally below, but often in the vicinity of the MDO concentration (0.005 mg/L). Process adjustments are underway to improve vanadium removal as part of the WWTP pilot trials. This item remains open.
Report #16: Pending Data	Analytical results for samples collected May 26 – 28 were not reported.	Available analytical results are discussed in Sections 3.3 through 3.7 of Report #17. Available methylmercury, dioxins and furans results are discussed in Sections 3.5 – 3.7 of Report #20. This item is closed.
Report #17: Pending Data	Methyl mercury, dioxin and furan results for samples collected June 3 – 4 and June 8 were not reported.	Available methylmercury results for the June 3 SP-E-OUT sample are discussed in Section 3.3 of Report #17. Available methylmercury results for the June 4 and June 8 samples are discussed in Section 3.3 of Report #18. Dioxin and furan results for samples collected June 3 – 4, and June 8 were not complete at the time of reporting. Testing of these parameters typically requires up to 4 weeks to complete. The pending results are expected in mid July. This item remains open.
Report # 18: Pending Data	Dioxin and furan results for samples collected June 10 were not reported.	Dioxins and furans results were not complete at the time of reporting. Testing of these parameters typically requires up to 4 weeks to complete. The pending results are expected in mid July. This item remains open.
Report #19: Pending Data	Methyl mercury, dioxin and furan results for samples collected June 16 and June 22 were not reported.	Available methylmercury results are discussed in Section 3.3 of Report #20. Dioxins and furans results were not complete at the time of reporting. Testing of these parameters typically requires up to 4 weeks to complete. The pending results are expected in late July. This item remains open.

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

5. Closure

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

Regards,

LORAX ENVIRONMENTAL SERVICES LTD.

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Environmental Geoscientist

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Figure 1: Completed or under construction water management facilities and established PE-111578 monitoring stations (June 29, 2024).

Appendix A:
East and West Catchment Photographs

Figure 2: East Catchment Areas Dewatered to the East WWTP June 23 to June 29.

Figure 3: West Catchment Areas Dewatered to the East WWTP June 23 to June 29.

Figure 4: Aerial view of the East Sedimentation Pond showing the placement of two sediment curtains (June 28, 2024). The East WWTP is located on the left side of the pond.

Figure 5: Aerial view showing the West Sedimentation Pond and West WWTP (located to the right of the pond) on June 28, 2024.

Appendix B:
East Sedimentation Pond Results

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

Parameter	Unit	Lowest Applicable Guideline [1, 2]		PE-111578 Discharge Limit *	East Sedimentation Pond	
					In-Pond at Effluent Location	In-Pond Location
					SP-E-NE	SP-E-NW
					VA24B5064-004	VA24B5064-005
		Long Term	Short Term		2024-06-25 11:45	2024-06-25 14:55
General Parameters						
pH - Field	pH units	- [6]	-	5.5 - 9.0	7.2	-
Conductivity - Field	µS/cm	-	-	-	1882	-
Temperature - Field	°C	-	-	-	20.8	-
Salinity - Field	ppt	-	-	-	1.05	-
Turbidity - Field	NTU	-	-	-	2.78	-
TSS	mg/L	-	-	25	<3	6.0
Dissolved Oxygen - Field	mg/L	>=8	-	-	***6.40***	-
Anions and Nutrients						
Sulphate	mg/L	-	-	-	-	-
Chloride	mg/L	-	-	-	-	-
Fluoride	mg/L	-	1.5	-	-	-
Ammonia ($N\text{-}NH_3$)	mg/L	Variable [3]	Variable [3]	-	-	-
Nitrite ($N\text{-}NO_2$)	mg/L	-	-	-	-	-
Nitrate ($N\text{-}NO_3$)	mg/L	3.7	339	-	-	-
Total Metals						
Aluminum, total (T-Al)	mg/L	-	-	-	0.148	0.971
Antimony, total (T-Sb)	mg/L	-	0.27 [4]	-	0.00195	0.00203
Arsenic, total (T-As)	mg/L	0.0125	0.0125	-	0.00202	0.00242
Barium, total (T-Ba)	mg/L	-	-	-	0.00655	0.0144
Beryllium, total (T-Be)	mg/L	0.1	-	-	<0.0001	<0.0001
Boron, total (T-B)	mg/L	1.2	-	-	0.101	0.082
Cadmium, total (T-Cd)	mg/L	0.00012	-	-	<0.00001	0.0000284
Chromium, total (T-Cr)	mg/L	-	-	-	<0.001	0.00142
Cobalt, total (T-Co)	mg/L	-	-	-	<0.0002	0.0003
Copper, total (T-Cu)	mg/L	- [6]	- [6]	0.0043	0.00109	0.00352
Iron, total (T-Fe)	mg/L	-	-	-	0.067	0.611
Lead, total (T-Pb)	mg/L	- [6]	- [6]	0.0035	0.000354	0.00217
Manganese, total (T-Mn)	mg/L	-	-	-	0.00215	0.016
Mercury, total (T-Hg) [5]	mg/L	0.000016	-	-	<0.000005	0.0000055
Molybdenum, total (T-Mo)	mg/L	-	-	-	0.026	0.0256
Nickel, total (T-Ni)	mg/L	0.0083	-	-	<0.001	0.00063
Selenium, total (T-Se)	mg/L	0.002	-	-	0.000106	0.00014
Silver, total (T-Ag)	mg/L	0.0015	0.003	-	<0.00002	<0.00001
Thallium, total (T-Tl)	mg/L	-	-	-	<0.00002	0.00002
Uranium, total (T-U)	mg/L	-	-	-	0.0136	0.013
Vanadium, total (T-V)	mg/L	- [6]	-	0.0081	0.00534	0.00683
Zinc, total (T-Zn)	mg/L	- [6]	- [6]	0.0133	<0.006	0.0076
Hexavalent Chromium, total	mg/L	0.0015	-	-	0.00052	0.0006
Dissolved Metals						
Cadmium, dissolved (D-Cd)	mg/L	-	-	-	<0.00001	<0.000015
Copper, dissolved (D-Cu)	mg/L	-	-	-	0.00095	0.00166
Iron, dissolved (D-Fe)	mg/L	-	-	-	<0.02	<0.01
Lead, dissolved (D-Pb)	mg/L	-	-	-	<0.0001	<0.00005
Manganese, dissolved (D-Mn)	mg/L	-	-	-	0.00192	0.00262
Strontium, dissolved (D-Sr)	mg/L	-	-	-	0.158	0.162
Vanadium, dissolved (D-V)	mg/L	-	-	-	0.00503	0.00531
Zinc, dissolved (D-Zn)	mg/L	-	-	-	0.0025	0.0012
Polycyclic Aromatic Hydrocarbons (PAHs)						
Acenaphthene	mg/L	0.006	-	-	<0.00001	<0.00001
Acridine	mg/L	-	-	-	<0.00001	<0.00001
Anthracene	mg/L	-	-	-	<0.00001	<0.00001
Benz(a)anthracene	mg/L	-	-	-	<0.00001	<0.00001
Benzo(a)pyrene	mg/L	0.00001	-	-	<0.000005	0.0000056
Chrysene	mg/L	0.0001	-	-	<0.00001	<0.00001
Fluoranthene	mg/L	-	-	-	<0.00001	0.000017
Fluorene	mg/L	0.012	-	-	<0.00001	<0.00001
1-methylnaphthalene	mg/L	0.001	-	-	<0.00001	<0.00001
2-methylnaphthalene	mg/L	0.001	-	-	<0.00001	<0.00001
Naphthalene	mg/L	0.001	-	-	<0.00005	<0.00005
Phenanthrene	mg/L	-	-	-	<0.00002	<0.00002
Pyrene	mg/L	-	-	-	<0.00001	0.000014
Quinoline	mg/L	-	-	-	<0.00005	<0.00005
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.
Results in orange text exceeded the PE11578 East Sedimentation Pond Discharge Limit.
* The PE111578 East Sedimentation Pond Discharge Limit applies only to the point of discharge from the East Sedimentation Pond (SP-E-Out).
[1] Approved British Columbia Water Quality Guidelines for the protection of marine aquatic life (BC ENV, 2021). Where an approved guideline is not established, the working guideline is applied.
[2] Canadian Water Quality Guideline for the protection of marine aquatic life (CCME, 2021).
[3] The approved total ammonia nitrogen BC WQG is salinity, pH and temperature dependent; see Tables 26E and 26F in BC WQG guidance document (BC ENV, 2021).
[4] The working BC WQG for trivalent antimony [SB(III)] is 0.27 mg/L and is applied to total antimony results.
[5] When MeHg ⩽ 0.5% of total Hg, BC WQG = 0.00002 mg/L.
[6] Where discharge limits apply, the water quality guideline was not evaluated.
The lowest applicable guidelines are shown in the table; however, water quality data was screened to all applicable guidelines

Table B-2: Summary of East Sedimentation Pond Water Quality Results for Methylmercury Received at the Time of Reporting.

Parameter	Unit	East Sedimentation Pond
		Effluent
		SP-E-OUT
		VA24B4840-001
		2024-06-22 15:50
Methylmercury	**µg/L**	<0.000080

Table B-3: Summary of East Sedimentation Pond Daily Field Parameters Received at the Time of Reporting.

Parameter		Temperature	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 [1]		-	-	-	-	5.5 - 9.0	-	-	-[2]
Lowest Applicable Guideline [3,4]		-	>=8	-	-	-[5]	-	-	-
Station ID [6]	**Date**								
- [7]	2024-06-23	-	-	-	-	-	-	-	675
-	2024-06-24	-	-	-	-	-	-	-	0
SP-E-NE	2024-06-25 11:36	20.8	***6.40***	1.05	2.78	7.2	1882	No	0
SP-E-NE	2024-06-26 15:29	20.2	***6.85***	0.81	51.8	6.9	1462	No	0
SP-E-NE	2024-06-27 16:08	19.3	***6.83***	0.81	32.3	7.4	1430	No	0
SP-E-NE	20024-6-28 14:23	21.1	***5.41***	0.82	22.5	7.2	1506	No	0
SP-E-NE	2024-06-29 14:16	22.1	***7.25***	0.82	22.2	7.5	1631	No	0

Notes:

Results ***underlined in bold italics*** exceed the applicable long-term water quality guideline for the protection of marine water aquatic life.

Results in orange text exceeded the PE11578 East Sedimentation Pond Discharge Limit.

[1] PE-111578 East Sedimentation Pond Discharge Limit applies only to the point of discharge from the East Sedimentation Pond (SP-E-OUT).

[2] 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.

[3] Approved British Columbia Water Quality Guidelines for the protection of marine aquatic life (BC ENV, 2021). Where an approved guideline is not established, the working guideline is applied.

[4] Canadian Water Quality Guideline for the protection of marine aquatic life (CCME, 2021).

[5] Discharge limit applies therefore the water quality guideline was not evaluated.

[6] The sedimentation pond did not receive non-contaminated contact water influent June 23 – June 29, therefore daily measurements for station SP-E-IN-2 were not collected. The pond did not discharge after June 23 therefore field measurements were not collected at SP-E-OUT. 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.

[7] Discharge from the East Sedimentation Pond was initiated during dayshift on June 22 and ceased during June 22/23 nightshift. The discharge during nightshift is reported as June 23 discharge. Field measurements were collected from SP-E-OUT on June 22, discussed in Report #19, and these measurements are considered representative of the discharge that concluded during nightshift June 22/23 (and reported as discharge on June 23)..

Appendix C: East Wastewater Treatment Plant Results

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

Parameter	Unit	Minimum Discharge Objective [1]	East WWTP		
			Influent	Influent	Effluent
			WWTP-E-IN-Baker 1	WWTP-E-IN-Baker 2	WWTP-E-OUT
			VA24B5064-001	VA24B5064-002	VA24B5064-003
			2024-06-25 13:55	2024-06-25 13:10	2024-06-25 12:00
General Parameters					
pH - Field	pH units	7.0 - 8.7	8.2	8.7	***6.7***
Conductivity - Field	µS/cm	-	168	335	2217
Temperature - Field	°C	-	21.6	20.2	21.0
Salinity - Field	ppt	-	0.09	0.18	1.14
Turbidity - Field	NTU	-	40.0	76.5	0.28
TSS	mg/L	-	12	13.6	<3
Dissolved Oxygen - Field	mg/L	>=8	***5.59***	***6.71***	***5.86***
Anions and Nutrients					
Sulphate	mg/L	-	22.4	17.3	85.4
Chloride	mg/L	-	3.08	11.2	562
Fluoride	mg/L	-	0.089	0.25	<0.4
Ammonia ($N\text{-}NH_3$)	mg/L	Variable	<0.005	0.0915	0.0159
Nitrite ($N\text{-}NO_2$)	mg/L	-	<0.001	0.0176	<0.02
Nitrate ($N\text{-}NO_3$)	mg/L	3.7	<0.005	0.208	<0.1
Total Metals					
Aluminum, total (T-Al)	mg/L	-	1.49	3.42	0.0573
Antimony, total (T-Sb)	mg/L	-	0.00195	0.00102	0.002
Arsenic, total (T-As)	mg/L	0.0125	0.00203	0.0043	0.00213
Barium, total (T-Ba)	mg/L	-	0.0164	0.0264	0.00791
Beryllium, total (T-Be)	mg/L	0.1	<0.0001	<0.0001	<0.0001
Boron, total (T-B)	mg/L	1.2	0.058	0.133	0.140
Cadmium, total (T-Cd)	mg/L	0.00012	0.0000318	0.0000704	<0.00001
Chromium, total (T-Cr)	mg/L	-	0.00153	0.00245	0.00101
Cobalt, total (T-Co)	mg/L	-	0.00046	0.00102	<0.0002
Copper, total (T-Cu)	mg/L	0.002	***0.0075***	***0.0196***	0.00141
Iron, total (T-Fe)	mg/L	-	0.92	2.07	<0.02
Lead, total (T-Pb)	mg/L	0.002	***0.00355***	***0.00711***	<0.0001
Manganese, total (T-Mn)	mg/L	-	0.0306	0.0704	0.0004
Mercury, total (T-Hg)	mg/L	0.000016	0.0000071	***0.0000181***	<0.000005
Molybdenum, total (T-Mo)	mg/L	-	0.0244	0.0545	0.0234
Nickel, total (T-Ni)	mg/L	0.0083	0.00092	0.00186	<0.001
Selenium, total (T-Se)	mg/L	0.002	0.000295	0.000191	0.000105
Silver, total (T-Ag)	mg/L	0.0015	<0.00001	0.000027	<0.00002
Thallium, total (T-Tl)	mg/L	-	0.00001	0.000018	<0.00002
Uranium, total (T-U)	mg/L	-	0.0117	0.041	0.0122
Vanadium, total (T-V)	mg/L	0.005	***0.00627***	***0.0137***	***0.00530***
Zinc, total (T-Zn)	mg/L	0.01	0.0092	***0.0152***	<0.006
Hexavalent Chromium, total	mg/L	0.0015	<0.0005	<0.0005	0.00094
Dissolved Metals					
Cadmium, dissolved (D-Cd)	mg/L	-	<0.00001	<0.000015	<0.00001
Copper, dissolved (D-Cu)	mg/L	-	0.00259	0.00456	0.00101
Iron, dissolved (D-Fe)	mg/L	-	<0.01	0.058	<0.02
Lead, dissolved (D-Pb)	mg/L	-	<0.00005	0.000363	<0.0001
Manganese, dissolved (D-Mn)	mg/L	-	0.00141	0.00329	0.00034
Strontium, dissolved (D-Sr)	mg/L	-	0.0823	0.154	0.223
Vanadium, dissolved (D-V)	mg/L	-	0.00377	0.00952	0.00526
Zinc, dissolved (D-Zn)	mg/L	-	<0.001	<0.001	<0.002
Polycyclic Aromatic Hydrocarbons (PAHs)					
Acenaphthene	mg/L	0.006	<0.00001	<0.00001	<0.00001
Acridine	mg/L	-	<0.00001	<0.00001	<0.00001
Anthracene	mg/L	-	<0.00001	<0.00001	<0.00001
Benz(a)anthracene	mg/L	-	<0.00001	0.000024	<0.00001
Benzo(a)pyrene	mg/L	0.00001	<0.000005	***0.0000254***	<0.000005
Chrysene	mg/L	0.0001	<0.00001	<0.00003	<0.00001
Fluoranthene	mg/L	-	0.000012	0.000058	<0.00001
Fluorene	mg/L	0.012	<0.00001	<0.00001	<0.00001
1-methylnaphthalene	mg/L	0.001	<0.00001	<0.00001	<0.00001
2-methylnaphthalene	mg/L	0.001	<0.00001	<0.00001	<0.00001
Naphthalene	mg/L	0.001	<0.00005	<0.00005	<0.00005
Phenanthrene	mg/L	-	<0.00002	0.000020	<0.00002
Pyrene	mg/L	-	0.000022	0.000072	<0.00001
Quinoline	mg/L	-	<0.00005	<0.00005	<0.00005
Volatile Organic Compounds (VOCs)					
Benzene	mg/L	0.11	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/L	0.25	<0.0005	<0.0005	<0.0005
Methyl-tert-butyl-ether	mg/L	5	<0.0005	<0.0005	<0.0005
Styrene	mg/L	-	<0.0005	<0.0005	<0.0005
Toluene	mg/L	0.215	<0.0004	<0.0004	<0.0004
Total Xylenes	mg/L	-	<0.0005	<0.0005	<0.0005
Chlorobenzene	mg/L	0.025	<0.0005	<0.0005	<0.0005
1,2-Dichlorobenzene	mg/L	0.042	<0.0005	<0.0005	<0.0005

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

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

Parameter		Temperature	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]		-	>=8	-	-	7.0 - 8.7	-	-	-
Station ID	Date								
WWTP-E-IN	2024-06-23 12:03	20.3	***6.45***	0.79	8.94	7.5	1424	No	-
WWTP-E-OUT	2024-06-23 12:10	20.2	***7.30***	0.84	1.78	7.2	1497	No	518
WWTP-E-IN	2024-06-24 13:24	20.2	***7.94***	0.82	4.79	***6.9***	1611	No	-
WWTP-E-OUT	2024-06-24 13:32	20.5	***7.22***	0.83	0.5	7.2	1639	No	520
WWTP-E-IN	2024-06-25 12:31	21.1	***5.20***	0.99	2.37	7.5	1939	No	-
WWTP-E-OUT	2024-06-25 11:57	21.0	***5.86***	1.14	0.28	***6.7***	2217	No	511
WWTP-E-IN	2024-06-26 15:31	20.5	***6.29***	0.82	44.4	7.4	1473	No	-
WWTP-E-OUT	2024-06-26 15:35	19.3	***7.97***	0.73	6.32	***6.6***	1285	No	481
WWTP-E-IN	2024-06-27 16:12	19.3	***6.28***	0.81	30.1	7.7	1434	No	-
WWTP-E-OUT	2024-06-27 16:18	18.8	***6.87***	0.82	0.67	7.2	1426	No	509
WWTP-E-IN	2024-06-28 16:17	19.7	***7.11***	0.84	29.3	7.5	1492	No	-
WWTP-E-OUT	2024-06-28 16:20	19.3	***1.21***	0.70	2.6	7.2	1245	No	564
WWTP-E-IN	2024-06-29 14:26	20.2	***7.02***	0.76	24.8	7.6	1364	No	-
WWTP-E-OUT	2024-06-29 14:30	20.5	***7.22***	0.86	2.28	7.1	1555	No	570

Notes:
[1] PE-111578 East WWTP Discharge Limit is applied to effluent compliance station WWTP-E-OUT.
[2] Minimum discharge objective for the WWTP effluent.
Results ***underlined in bold italics*** exceed the applicable minimum discharge objective.

Appendix D: Non-Contact Diversion Outlet Results

Table D-1: Summary of Freshwater Quality Results for Methylmercury Results Received at the Time of Reporting.

Parameter	Unit	Station OUT-02
		Non-Contact Water Diversion Ditch Outlet
		OUT-02
		VA24B1929-002
		2024-05-27 10:50
Methylmercury	**µg/L**	0.000025

Appendix E: Freshwater Receiving Environment Results

Table E-1: Summary of Freshwater Quality Results for Dioxins and Furans Results Received at the Time of Reporting.

Parameter	Unit	Station SW-01	Station SW-02	Station SW-07	Station SW-04
		Lower Reach of Woodfibre Creek (near the mouth)	Upper Reach of Mill Creek (upstream of the third bridge)	Upstream Mill Creek (at the diversion inlet)	Lower Reach of East Creek (near the outlet to the outfall culvert)
		SW-01	SW-02	SW-07	SW-04
		L2755960-1	L2755961-1	L2755961-3	L2755961-4
		2024-05-27 10:20	2024-05-26 9:45	2024-05-26 14:40	2024-05-26 13:15
Lower Bound PCDD/F TEQ	**pg/L**	0.0139	0.00920	0.00514	0.115

Notes:
PCDD = polychlorinated dibenzodioxins (dioxins)
PCDF = polychlorinated dibenzofurans (furans)
TEQ = toxic equivalency
Lower bound PCDD/F TEQ is the sum of the toxic equivalency results for the individual PCDD/F parameters. Non-detectable parameters are assigned a value of zero (0).

Table E-2: Summary of Freshwater Quality Results for Methylmercury Results Received at the Time of Reporting.

Parameter	Unit	Station SW-01	Station SW-02	Station SW-07	Station SW-04
		Lower Reach of Woodfibre Creek (near the mouth)	Upper Reach of Mill Creek (upstream of the third bridge)	Upstream Mill Creek (at the diversion inlet)	Lower Reach of East Creek (near the outlet to the outfall culvert)
		SW-01	SW-02	SW-07	SW-04
		VA24B1929-001	VA24B1914-001	VA24B1914-003	VA24B1914-004
		2024-05-27 10:20	2024-05-26 9:45	2024-05-26 14:40	2024-05-26 13:15
Methylmercury	**µg/L**	<0.000020	<0.000020	<0.000020	0.000068

Appendix F: Estuarine Receiving Environment Results

Table F-1: Summary of Mill Creek Estuary Water Quality Results for Dioxins and Furans Results Received at the Time of Reporting.

Parameter	Unit	Station SW-03
		Mill Creek Estuary
		SW-03
		L2755961-2
		2024-05-26 11:05
Lower Bound PCDD/F TEQ	**pg/L**	0.0

Notes:
PCDD = polychlorinated dibenzodioxins (dioxins)
PCDF = polychlorinated dibenzofurans (furans)
TEQ = toxic equivalency
Lower bound PCDD/F TEQ is the sum of the toxic equivalency results for the individual PCDD/F parameters. Non-detectable parameters are assigned a value of zero (0).

Table F-2: Summary of Mill Creek Estuary Water Quality Results for Methylmercury Results Received at the Time of Reporting.

Parameter	Unit	Station SW-03
		Mill Creek Estuary
		SW-03
		VA24B1914-002
		2024-05-26 11:05
Methylmercury	**µg/L**	0.000022

Appendix G: Marine Water Receiving Environment Results

Table G-1: Summary of IDZ Marine Water Quality Results for Dioxins and Furans Received at the Time of Reporting

Parameter	Unit	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
		L2755981-4	L2755981-5	L2755981-6	L2755981-7	L2755981-8	L2755981-9
		2024-05-28 14:25	2024-05-28 14:40	2024-05-28 14:52	2024-05-28 15:10	2024-05-28 16:33	2024-05-28 16:39
Lower Bound PCDD/F TEQ	**pg/L**	0.00105	0.0	0.00937	0.0714	0.0407	0.0617

Notes:
PCDD = polychlorinated dibenzodioxins (dioxins)
PCDF = polychlorinated dibenzofurans (furans)
TEQ = toxic equivalency
Lower bound PCDD/F TEQ is the sum of the toxic equivalency results for the individual PCDD/F parameters. Non-detectable parameters are assigned a value of zero (0).

Table G-2: Summary of Reference Station Marine Water Quality Results for Dioxins and Furans Received at the Time of Reporting

Parameter	Unit	Reference Station WQR1		
		0.5 m Below Surface	2 m Below Surface	2 m Above Seafloor
		WQR1-0.5	WQR1-2m	WQR1-SF
		L2755981-1	L2755981-2	L2755981-3
		2024-05-28 17:08	2024-05-28 17:33	2024-05-28 17:47
Lower Bound PCDD/F TEQ	**pg/L**	0.0228	0.000924	0.000690

Notes:
PCDD = polychlorinated dibenzodioxins (dioxins)
PCDF = polychlorinated dibenzofurans (furans)
TEQ = toxic equivalency
Lower bound PCDD/F TEQ is the sum of the toxic equivalency results for the individual PCDD/F parameters. Non-detectable parameters are assigned a value of zero (0).

Table G-3: Summary of IDZ Marine Water Quality Results for Methylmercury Received at the Time of Reporting

Parameter	Unit	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
		VA24B2063-004	VA24B2063-005	VA24B2063-006	VA24B2063-007	VA24B2063-008	VA24B2063-009
		2024-05-28 14:25	2024-05-28 14:40	2024-05-28 14:52	2024-05-28 15:10	2024-05-28 16:33	2024-05-28 16:39
Methylmercury	**µg/L**	0.000021	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020

Table G-4: Summary of Reference Station Marine Water Quality Results for Methyl Mercury Received at the Time of Reporting

Parameter	Unit	Station WQR1		
		0.5 m Below Surface	2 m Below Surface	2 m Above Seafloor
		WQR1-0.5	WQR1-2m	WQR1-SF
		VA24B2063-001	VA24B2063-002	VA24B2063-003
		2024-05-28 17:08	2024-05-28 17:33	2024-05-28 17:47
Methylmercury	**µg/L**	<0.000020	<0.000020	<0.000020

Table 5: Weekly Report QC Evaluations and Ongoing Items

QC Procedure	Observation	Investigation/Resolution
Reporting Period (June 23 – 29, Report #20)		
Monitoring Program Evaluation	PE-111578 contact water, non-contact water and initial dilution zone monitoring stations have not been fully established.	The PE-111578 authorized works were under construction during the reporting period. Monitoring stations are progressively established as water management infrastructure is completed. The East Sedimentation Pond and East WWTP are completed, and pilot testing of the East WWTP is ongoing. The East Sedimentation Pond was commissioned for discharge on April 15. The West Sedimentation Pond is complete, except the outfall structure and West WWTP is under construction. The West Sedimentation Pond is not commissioned for discharge and did not discharge. The non-contact water diversion ditch that discharges at station OUT-06 has been commissioned, and stations for pre-existing outfalls OUT-01, OUT-02, and OUT-11 have also been established.
Monitoring Program Evaluation	The monitoring records collected since commissioning of the East WWTP and East Sedimentation Pond are being reviewed regarding frequency and parameters tested.	Monitoring records from commissioning of the East Sedimentation Pond for discharge (April 14) to the end of Report #20 monitoring period (June 29) were reviewed. Overall, samples were collected from the established monitoring stations at the PE-111578 required frequencies (i.e., daily, weekly, monthly and quarterly) and tested for the required parameters. • The PE-111578 specified sampling frequencies were not met at East Sedimentation Pond influent and effluent stations SP-E-IN-2 and SP-E-OUT, primarily for daily and weekly monitoring at the sedimentation pond. Flows at these stations were infrequent and samples were only collected when there were flows at the time of monitoring. • The PE-111578 specified weekly and monthly sampling frequencies were not met at clean water diversion ditch outlets (stations OUT-01, OUT-02, OUT-06 and OUT-11. Flows at these stations were infrequent and samples were only collected when there were flows at the time of monitoring. • High frequency monitoring samples (*i.e.,* first five weeks and 5-in-30 sampling) at sedimentation pond, WWTP and receiving environment stations were generally not collected over 5 consecutive weeks, there is a one week gap for most stations such that 5 samples were collected over 6 weeks. The "first five weeks" and "5-in-30" monitoring periods partially overlap therefore the same samples apply to both monitoring frequencies. • In some instances, samples were tested for a partial parameter list instead of the full list. This was resolved early June but required further review with site staff. • Marine reference station WQR2 was overlooked for two of the weekly sampling events. This was resolved early June. These findings will be reviewed with site Environmental Monitors to: 1) Refine monitoring strategies at stations where there are infrequent flows, if possible, to ensure required samples are collected at the specified frequencies. 2) Confirm that tests requested for the PE-111578 required samples include all specified parameters. This item remains open.
Data QC	The detection limit for total methyl mercury was raised for the SP-E-OUT sample collected June 22.	The detection limit reported for total methyl mercury in the June 22 SP-E-OUT sample was raised by the laboratory to <0.000080 ug/L, 4 times higher than the typically reported detection limit (<0.000020 µg/L). The lab indicates this was due to an analytical interference detected in the lab QC samples that required adjustment to reporting limit. This item is closed.
Pending Data	Dioxin and furan results for samples collected June 25 were not reported.	Dioxins and furans results were not complete at the time of reporting. Testing of these parameters typically requires up to 4 weeks to complete. The pending results are expected in early August. This item remains open.
	Analytical results for samples collected June 26 – 27 were not reported.	Analytical results for freshwater receiving environment samples collected June 26-27 were not available at the time of reporting. The pending results are expected to be available for the next reporting period. This item remains open.
Ongoing Items from Previous Weekly Reports		
Report #13: WWTP Performance Evaluation	The May 6 monitoring results for East WWTP indicate dissolved vanadium was not being removed by the treatment process.	Sampling conducted since May 6 indicates vanadium in treated WWTP effluent is almost entirely in soluble form, suggesting this form of vanadium is only partially treated, resulting in residual vanadium concentrations in the treated effluent that are generally below, but often in the vicinity of the MDO concentration (0.005 mg/L). Process adjustments are underway to improve vanadium removal as part of the WWTP pilot trials. This item remains open.
Report #16: Pending Data	Analytical results for samples collected May 26 – 28 were not reported.	Available analytical results are discussed in Sections 3.3 through 3.7 of Report #17. Available methylmercury, dioxins and furans results are discussed in Sections 3.5 – 3.7 of Report #20. This item is closed.
Report #17: Pending Data	Methyl mercury, dioxin and furan results for samples collected June 3 – 4 and June 8 were not reported.	Available methylmercury results for the June 3 SP-E-OUT sample are discussed in Section 3.3 of Report #17. Available methylmercury results for the June 4 and June 8 samples are discussed in Section 3.3 of Report #18. Dioxin and furan results for samples collected June 3 – 4, and June 8 were not complete at the time of reporting. Testing of these parameters typically requires up to 4 weeks to complete. The pending results are expected in mid July. This item remains open.
Report # 18: Pending Data	Dioxin and furan results for samples collected June 10 were not reported.	Dioxins and furans results were not complete at the time of reporting. Testing of these parameters typically requires up to 4 weeks to complete. The pending results are expected in mid July. This item remains open.
Report #19: Pending Data	Methyl mercury, dioxin and furan results for samples collected June 16 and June 22 were not reported.	Available methylmercury results are discussed in Section 3.3 of Report #20. Dioxins and furans results were not complete at the time of reporting. Testing of these parameters typically requires up to 4 weeks to complete. The pending results are expected in late July. This item remains open.

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

5. Closure

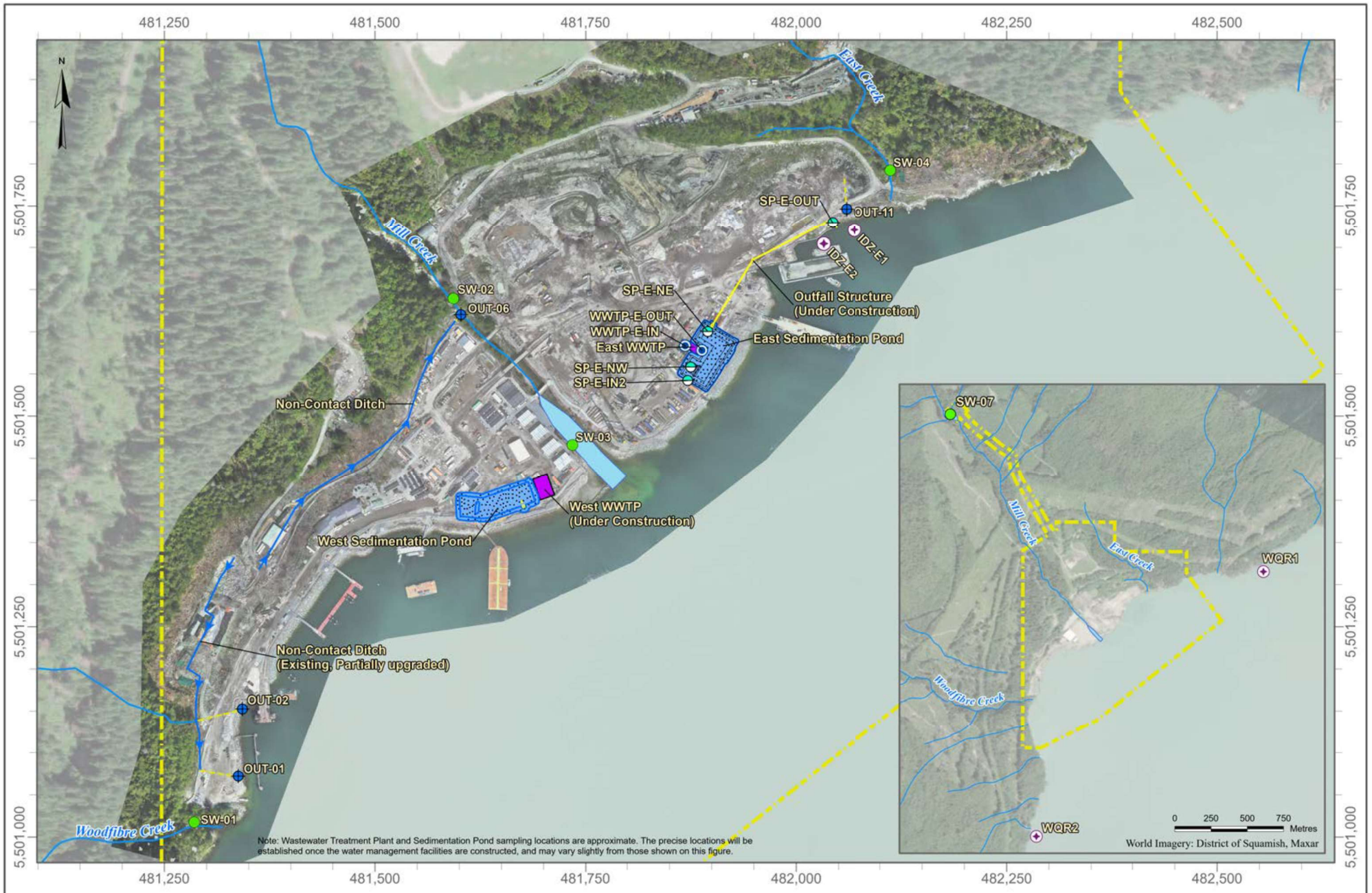
This weekly report is a desktop review by Lorax of the PE-111578 discharge and compliance monitoring program records, reports and results provided by Woodfibre LNG and prime contractor McDermott International and their sub-contractors. The records reviewed and analyzed by Lorax include ALS Environmental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

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



LEGEND

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

DATE SAVED:	Jul 03, 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 (June 29, 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

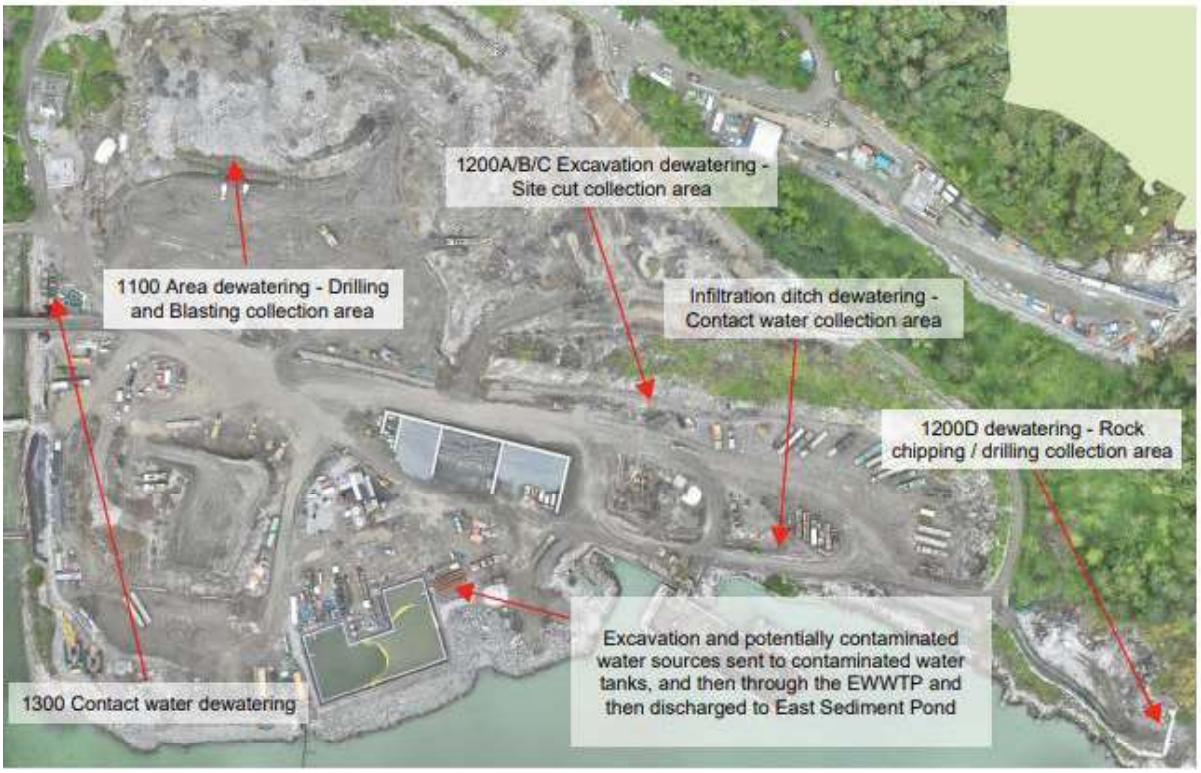


Figure 2: East Catchment Areas Dewatered to the East WWTP June 23 to June 29.

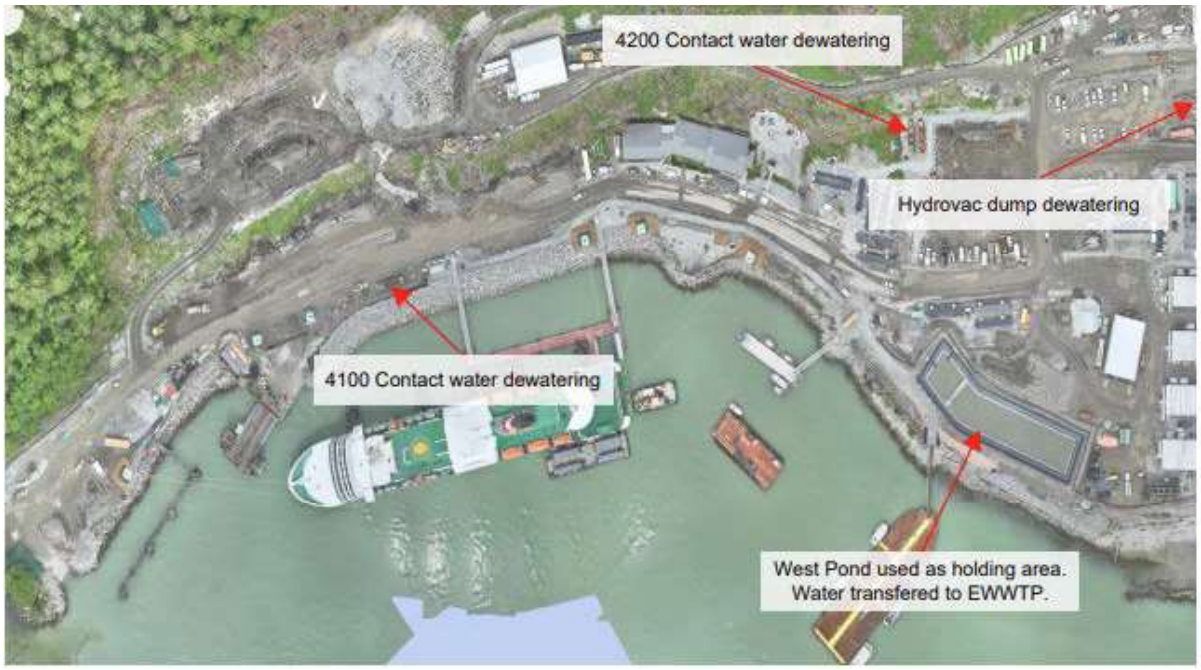


Figure 3: West Catchment Areas Dewatered to the East WWTP June 23 to June 29.

Figure 4: Aerial view of the East Sedimentation Pond showing the placement of two sediment curtains (June 28, 2024). The East WWTP is located on the left side of the pond.

Figure 5: Aerial view showing the West Sedimentation Pond and West WWTP (located to the right of the pond) on June 28, 2024.

Appendix B: East Sedimentation Pond Results

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

Parameter	Unit	Lowest Applicable Guideline [1, 2]		PE-111578 Discharge Limit *	East Sedimentation Pond	
					In-Pond at Effluent Location	In-Pond Location
					SP-E-NE	SP-E-NW
					VA24B5064-004	VA24B5064-005
		Long Term	Short Term		2024-06-25 11:45	2024-06-25 14:55
General Parameters						
pH - Field	pH units	- [6]	-	5.5 - 9.0	7.2	-
Conductivity - Field	µS/cm	-	-	-	1882	-
Temperature - Field	°C	-	-	-	20.8	-
Salinity - Field	ppt	-	-	-	1.05	-
Turbidity - Field	NTU	-	-	-	2.78	-
TSS	mg/L	-	-	25	<3	6.0
Dissolved Oxygen - Field	mg/L	>=8	-	-	***6.40***	-
Anions and Nutrients						
Sulphate	mg/L	-	-	-	-	-
Chloride	mg/L	-	-	-	-	-
Fluoride	mg/L	-	1.5	-	-	-
Ammonia (N-NH_3)	mg/L	Variable [3]	Variable [3]	-	-	-
Nitrite (N-NO_2)	mg/L	-	-	-	-	-
Nitrate (N-NO_3)	mg/L	3.7	339	-	-	-
Total Metals						
Aluminum, total (T-Al)	mg/L	-	-	-	0.148	0.971
Antimony, total (T-Sb)	mg/L	-	0.27 [4]	-	0.00195	0.00203
Arsenic, total (T-As)	mg/L	0.0125	0.0125	-	0.00202	0.00242
Barium, total (T-Ba)	mg/L	-	-	-	0.00655	0.0144
Beryllium, total (T-Be)	mg/L	0.1	-	-	<0.0001	<0.0001
Boron, total (T-B)	mg/L	1.2	-	-	0.101	0.082
Cadmium, total (T-Cd)	mg/L	0.00012	-	-	<0.00001	0.0000284
Chromium, total (T-Cr)	mg/L	-	-	-	<0.001	0.00142
Cobalt, total (T-Co)	mg/L	-	-	-	<0.0002	0.0003
Copper, total (T-Cu)	mg/L	- [6]	- [6]	0.0043	0.00109	0.00352
Iron, total (T-Fe)	mg/L	-	-	-	0.067	0.611
Lead, total (T-Pb)	mg/L	- [6]	- [6]	0.0035	0.000354	0.00217
Manganese, total (T-Mn)	mg/L	-	-	-	0.00215	0.016
Mercury, total (T-Hg) [5]	mg/L	0.000016	-	-	<0.000005	0.0000055
Molybdenum, total (T-Mo)	mg/L	-	-	-	0.026	0.0256
Nickel, total (T-Ni)	mg/L	0.0083	-	-	<0.001	0.00063
Selenium, total (T-Se)	mg/L	0.002	-	-	0.000106	0.00014
Silver, total (T-Ag)	mg/L	0.0015	0.003	-	<0.00002	<0.00001
Thallium, total (T-Tl)	mg/L	-	-	-	<0.00002	0.00002
Uranium, total (T-U)	mg/L	-	-	-	0.0136	0.013
Vanadium, total (T-V)	mg/L	- [6]	-	0.0081	0.00534	0.00683
Zinc, total (T-Zn)	mg/L	- [6]	- [6]	0.0133	<0.006	0.0076
Hexavalent Chromium, total	mg/L	0.0015	-	-	0.00052	0.0006
Dissolved Metals						
Cadmium, dissolved (D-Cd)	mg/L	-	-	-	<0.00001	<0.000015
Copper, dissolved (D-Cu)	mg/L	-	-	-	0.00095	0.00166
Iron, dissolved (D-Fe)	mg/L	-	-	-	<0.02	<0.01
Lead, dissolved (D-Pb)	mg/L	-	-	-	<0.0001	<0.00005
Manganese, dissolved (D-Mn)	mg/L	-	-	-	0.00192	0.00262
Strontium, dissolved (D-Sr)	mg/L	-	-	-	0.158	0.162
Vanadium, dissolved (D-V)	mg/L	-	-	-	0.00503	0.00531
Zinc, dissolved (D-Zn)	mg/L	-	-	-	0.0025	0.0012
Polycyclic Aromatic Hydrocarbons (PAHs)						
Acenaphthene	mg/L	0.006	-	-	<0.00001	<0.00001
Acridine	mg/L	-	-	-	<0.00001	<0.00001
Anthracene	mg/L	-	-	-	<0.00001	<0.00001
Benz(a)anthracene	mg/L	-	-	-	<0.00001	<0.00001
Benzo(a)pyrene	mg/L	0.00001	-	-	<0.000005	0.0000056
Chrysene	mg/L	0.0001	-	-	<0.00001	<0.00001
Fluoranthene	mg/L	-	-	-	<0.00001	0.000017
Fluorene	mg/L	0.012	-	-	<0.00001	<0.00001
1-methylnaphthalene	mg/L	0.001	-	-	<0.00001	<0.00001
2-methylnaphthalene	mg/L	0.001	-	-	<0.00001	<0.00001
Naphthalene	mg/L	0.001	-	-	<0.00005	<0.00005
Phenanthrene	mg/L	-	-	-	<0.00002	<0.00002
Pyrene	mg/L	-	-	-	<0.00001	0.000014
Quinoline	mg/L	-	-	-	<0.00005	<0.00005
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.
Results in orange text exceeded the PE11578 East Sedimentation Pond Discharge Limit.
* The PE111578 East Sedimentation Pond Discharge Limit applies only to the point of discharge from the East Sedimentation Pond (SP-E-Out).
[1] Approved British Columbia Water Quality Guidelines for the protection of marine aquatic life (BC ENV, 2021). Where an approved guideline is not established, the working guideline is applied.
[2] Canadian Water Quality Guideline for the protection of marine aquatic life (CCME, 2021).
[3] The approved total ammonia nitrogen BC WQG is salinity, pH and temperature dependent; see Tables 26E and 26F in BC WQG guidance document (BC ENV, 2021).
[4] The working BC WQG for trivalent antimony [SB(III)] is 0.27 mg/L and is applied to total antimony results.
[5] When MeHg ⩽ 0.5% of total Hg, BC WQG = 0.00002 mg/L.
[6] Where discharge limits apply, the water quality guideline was not evaluated.
The lowest applicable guidelines are shown in the table; however, water quality data was screened to all applicable guidelines

Table B-2: Summary of East Sedimentation Pond Water Quality Results for Methylmercury Received at the Time of Reporting.

Parameter	Unit	East Sedimentation Pond
		Effluent
		SP-E-OUT
		VA24B4840-001
		2024-06-22 15:50
Methylmercury	**µg/L**	<0.000080

Table B-3: Summary of East Sedimentation Pond Daily Field Parameters Received at the Time of Reporting.

Parameter		Temperature	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 [1]		-	-	-	-	5.5 - 9.0	-	-	-[2]
Lowest Applicable Guideline [3,4]		-	>=8	-	-	-[5]	-	-	-
Station ID [6]	**Date**								
- [7]	2024-06-23	-	-	-	-	-	-	-	675
-	2024-06-24	-	-	-	-	-	-	-	0
SP-E-NE	2024-06-25 11:36	20.8	***6.40***	1.05	2.78	7.2	1882	No	0
SP-E-NE	2024-06-26 15:29	20.2	***6.85***	0.81	51.8	6.9	1462	No	0
SP-E-NE	2024-06-27 16:08	19.3	***6.83***	0.81	32.3	7.4	1430	No	0
SP-E-NE	20024-6-28 14:23	21.1	***5.41***	0.82	22.5	7.2	1506	No	0
SP-E-NE	2024-06-29 14:16	22.1	***7.25***	0.82	22.2	7.5	1631	No	0

Notes:
Results ***underlined in bold italics*** exceed the applicable long-term water quality guideline for the protection of marine water aquatic life.
Results in orange text exceeded the PE11578 East Sedimentation Pond Discharge Limit.
[1] PE-111578 East Sedimentation Pond Discharge Limit applies only to the point of discharge from the East Sedimentation Pond (SP-E-OUT).
[2] 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.
[3] Approved British Columbia Water Quality Guidelines for the protection of marine aquatic life (BC ENV, 2021). Where an approved guideline is not established, the working guideline is applied.
[4] Canadian Water Quality Guideline for the protection of marine aquatic life (CCME, 2021).
[5] Discharge limit applies therefore the water quality guideline was not evaluated.
[6] The sedimentation pond did not receive non-contaminated contact water influent June 23 – June 29, therefore daily measurements for station SP-E-IN-2 were not collected. The pond did not discharge after June 23 therefore field measurements were not collected at SP-E-OUT. 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.
[7] Discharge from the East Sedimentation Pond was initiated during dayshift on June 22 and ceased during June 22/23 nightshift. The discharge during nightshift is reported as June 23 discharge. Field measurements were collected from SP-E-OUT on June 22, discussed in Report #19, and these measurements are considered representative of the discharge that concluded during nightshift June 22/23 (and reported as discharge on June 23)..

Appendix C: East Wastewater Treatment Plant Results

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

Parameter	Unit	Minimum Discharge Objective [1]	East WWTP		
			Influent	Influent	Effluent
			WWTP-E-IN-Baker 1	WWTP-E-IN-Baker 2	WWTP-E-OUT
			VA24B5064-001	VA24B5064-002	VA24B5064-003
			2024-06-25 13:55	2024-06-25 13:10	2024-06-25 12:00
General Parameters					
pH - Field	pH units	7.0 - 8.7	8.2	8.7	***6.7***
Conductivity - Field	µS/cm	-	168	335	2217
Temperature - Field	°C	-	21.6	20.2	21.0
Salinity - Field	ppt	-	0.09	0.18	1.14
Turbidity - Field	NTU	-	40.0	76.5	0.28
TSS	mg/L	-	12	13.6	<3
Dissolved Oxygen - Field	mg/L	>=8	***5.59***	***6.71***	***5.86***
Anions and Nutrients					
Sulphate	mg/L	-	22.4	17.3	85.4
Chloride	mg/L	-	3.08	11.2	562
Fluoride	mg/L	-	0.089	0.25	<0.4
Ammonia (N-NH_3)	mg/L	Variable	<0.005	0.0915	0.0159
Nitrite (N-NO_2)	mg/L	-	<0.001	0.0176	<0.02
Nitrate (N-NO_3)	mg/L	3.7	<0.005	0.208	<0.1
Total Metals					
Aluminum, total (T-Al)	mg/L	-	1.49	3.42	0.0573
Antimony, total (T-Sb)	mg/L	-	0.00195	0.00102	0.002
Arsenic, total (T-As)	mg/L	0.0125	0.00203	0.0043	0.00213
Barium, total (T-Ba)	mg/L	-	0.0164	0.0264	0.00791
Beryllium, total (T-Be)	mg/L	0.1	<0.0001	<0.0001	<0.0001
Boron, total (T-B)	mg/L	1.2	0.058	0.133	0.140
Cadmium, total (T-Cd)	mg/L	0.00012	0.0000318	0.0000704	<0.00001
Chromium, total (T-Cr)	mg/L	-	0.00153	0.00245	0.00101
Cobalt, total (T-Co)	mg/L	-	0.00046	0.00102	<0.0002
Copper, total (T-Cu)	mg/L	0.002	***0.0075***	***0.0196***	0.00141
Iron, total (T-Fe)	mg/L	-	0.92	2.07	<0.02
Lead, total (T-Pb)	mg/L	0.002	***0.00355***	***0.00711***	<0.0001
Manganese, total (T-Mn)	mg/L	-	0.0306	0.0704	0.0004
Mercury, total (T-Hg)	mg/L	0.000016	0.0000071	***0.0000181***	<0.000005
Molybdenum, total (T-Mo)	mg/L	-	0.0244	0.0545	0.0234
Nickel, total (T-Ni)	mg/L	0.0083	0.00092	0.00186	<0.001
Selenium, total (T-Se)	mg/L	0.002	0.000295	0.000191	0.000105
Silver, total (T-Ag)	mg/L	0.0015	<0.00001	0.000027	<0.00002
Thallium, total (T-Tl)	mg/L	-	0.00001	0.000018	<0.00002
Uranium, total (T-U)	mg/L	-	0.0117	0.041	0.0122
Vanadium, total (T-V)	mg/L	0.005	***0.00627***	***0.0137***	***0.00530***
Zinc, total (T-Zn)	mg/L	0.01	0.0092	***0.0152***	<0.006
Hexavalent Chromium, total	mg/L	0.0015	<0.0005	<0.0005	0.00094
Dissolved Metals					
Cadmium, dissolved (D-Cd)	mg/L	-	<0.00001	<0.000015	<0.00001
Copper, dissolved (D-Cu)	mg/L	-	0.00259	0.00456	0.00101
Iron, dissolved (D-Fe)	mg/L	-	<0.01	0.058	<0.02
Lead, dissolved (D-Pb)	mg/L	-	<0.00005	0.000363	<0.0001
Manganese, dissolved (D-Mn)	mg/L	-	0.00141	0.00329	0.00034
Strontium, dissolved (D-Sr)	mg/L	-	0.0823	0.154	0.223
Vanadium, dissolved (D-V)	mg/L	-	0.00377	0.00952	0.00526
Zinc, dissolved (D-Zn)	mg/L	-	<0.001	<0.001	<0.002
Polycyclic Aromatic Hydrocarbons (PAHs)					
Acenaphthene	mg/L	0.006	<0.00001	<0.00001	<0.00001
Acridine	mg/L	-	<0.00001	<0.00001	<0.00001
Anthracene	mg/L	-	<0.00001	<0.00001	<0.00001
Benz(a)anthracene	mg/L	-	<0.00001	0.000024	<0.00001
Benzo(a)pyrene	mg/L	0.00001	<0.000005	***0.0000254***	<0.000005
Chrysene	mg/L	0.0001	<0.00001	<0.00003	<0.00001
Fluoranthene	mg/L	-	0.000012	0.000058	<0.00001
Fluorene	mg/L	0.012	<0.00001	<0.00001	<0.00001
1-methylnaphthalene	mg/L	0.001	<0.00001	<0.00001	<0.00001
2-methylnaphthalene	mg/L	0.001	<0.00001	<0.00001	<0.00001
Naphthalene	mg/L	0.001	<0.00005	<0.00005	<0.00005
Phenanthrene	mg/L	-	<0.00002	0.000020	<0.00002
Pyrene	mg/L	-	0.000022	0.000072	<0.00001
Quinoline	mg/L	-	<0.00005	<0.00005	<0.00005
Volatile Organic Compounds (VOCs)					
Benzene	mg/L	0.11	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/L	0.25	<0.0005	<0.0005	<0.0005
Methyl-tert-butyl-ether	mg/L	5	<0.0005	<0.0005	<0.0005
Styrene	mg/L	-	<0.0005	<0.0005	<0.0005
Toluene	mg/L	0.215	<0.0004	<0.0004	<0.0004
Total Xylenes	mg/L	-	<0.0005	<0.0005	<0.0005
Chlorobenzene	mg/L	0.025	<0.0005	<0.0005	<0.0005
1,2-Dichlorobenzene	mg/L	0.042	<0.0005	<0.0005	<0.0005

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

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

Parameter		Temperature	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]		-	>=8	-	-	7.0 - 8.7	-	-	-
Station ID	Date								
WWTP-E-IN	2024-06-23 12:03	20.3	***6.45***	0.79	8.94	7.5	1424	No	-
WWTP-E-OUT	2024-06-23 12:10	20.2	***7.30***	0.84	1.78	7.2	1497	No	518
WWTP-E-IN	2024-06-24 13:24	20.2	***7.94***	0.82	4.79	***6.9***	1611	No	-
WWTP-E-OUT	2024-06-24 13:32	20.5	***7.22***	0.83	0.5	7.2	1639	No	520
WWTP-E-IN	2024-06-25 12:31	21.1	***5.20***	0.99	2.37	7.5	1939	No	-
WWTP-E-OUT	2024-06-25 11:57	21.0	***5.86***	1.14	0.28	***6.7***	2217	No	511
WWTP-E-IN	2024-06-26 15:31	20.5	***6.29***	0.82	44.4	7.4	1473	No	-
WWTP-E-OUT	2024-06-26 15:35	19.3	***7.97***	0.73	6.32	***6.6***	1285	No	481
WWTP-E-IN	2024-06-27 16:12	19.3	***6.28***	0.81	30.1	7.7	1434	No	-
WWTP-E-OUT	2024-06-27 16:18	18.8	***6.87***	0.82	0.67	7.2	1426	No	509
WWTP-E-IN	2024-06-28 16:17	19.7	***7.11***	0.84	29.3	7.5	1492	No	-
WWTP-E-OUT	2024-06-28 16:20	19.3	***1.21***	0.70	2.6	7.2	1245	No	564
WWTP-E-IN	2024-06-29 14:26	20.2	***7.02***	0.76	24.8	7.6	1364	No	-
WWTP-E-OUT	2024-06-29 14:30	20.5	***7.22***	0.86	2.28	7.1	1555	No	570

Notes:
[1] PE-111578 East WWTP Discharge Limit is applied to effluent compliance station WWTP-E-OUT.
[2] Minimum discharge objective for the WWTP effluent.
Results ***underlined in bold italics*** exceed the applicable minimum discharge objective.

Appendix D: Non-Contact Diversion Outlet Results

Table D-1: Summary of Freshwater Quality Results for Methylmercury Results Received at the Time of Reporting.

Parameter	Unit	Station OUT-02
		Non-Contact Water Diversion Ditch Outlet
		OUT-02
		VA24B1929-002
		2024-05-27 10:50
Methylmercury	**µg/L**	0.000025

Appendix E: Freshwater Receiving Environment Results

Table E-1: Summary of Freshwater Quality Results for Dioxins and Furans Results Received at the Time of Reporting.

Parameter	Unit	Station SW-01	Station SW-02	Station SW-07	Station SW-04
		Lower Reach of Woodfibre Creek (near the mouth)	Upper Reach of Mill Creek (upstream of the third bridge)	Upstream Mill Creek (at the diversion inlet)	Lower Reach of East Creek (near the outlet to the outfall culvert)
		SW-01	SW-02	SW-07	SW-04
		L2755960-1	L2755961-1	L2755961-3	L2755961-4
		2024-05-27 10:20	2024-05-26 9:45	2024-05-26 14:40	2024-05-26 13:15
Lower Bound PCDD/F TEQ	**pg/L**	0.0139	0.00920	0.00514	0.115

Notes:
PCDD = polychlorinated dibenzodioxins (dioxins)
PCDF = polychlorinated dibenzofurans (furans)
TEQ = toxic equivalency
Lower bound PCDD/F TEQ is the sum of the toxic equivalency results for the individual PCDD/F parameters. Non-detectable parameters are assigned a value of zero (0).

Table E-2: Summary of Freshwater Quality Results for Methylmercury Results Received at the Time of Reporting.

Parameter	Unit	Station SW-01	Station SW-02	Station SW-07	Station SW-04
		Lower Reach of Woodfibre Creek (near the mouth)	Upper Reach of Mill Creek (upstream of the third bridge)	Upstream Mill Creek (at the diversion inlet)	Lower Reach of East Creek (near the outlet to the outfall culvert)
		SW-01	SW-02	SW-07	SW-04
		VA24B1929-001	VA24B1914-001	VA24B1914-003	VA24B1914-004
		2024-05-27 10:20	2024-05-26 9:45	2024-05-26 14:40	2024-05-26 13:15
Methylmercury	**µg/L**	<0.000020	<0.000020	<0.000020	0.000068

Appendix F: Estuarine Receiving Environment Results

Table F-1: Summary of Mill Creek Estuary Water Quality Results for Dioxins and Furans Results Received at the Time of Reporting.

Parameter	Unit	Station SW-03
		Mill Creek Estuary
		SW-03
		L2755961-2
		2024-05-26 11:05
Lower Bound PCDD/F TEQ	**pg/L**	0.0

Notes:
PCDD = polychlorinated dibenzodioxins (dioxins)
PCDF = polychlorinated dibenzofurans (furans)
TEQ = toxic equivalency
Lower bound PCDD/F TEQ is the sum of the toxic equivalency results for the individual PCDD/F parameters. Non-detectable parameters are assigned a value of zero (0).

Table F-2: Summary of Mill Creek Estuary Water Quality Results for Methylmercury Results Received at the Time of Reporting.

Parameter	Unit	Station SW-03
		Mill Creek Estuary
		SW-03
		VA24B1914-002
		2024-05-26 11:05
Methylmercury	**µg/L**	0.000022

Appendix G: Marine Water Receiving Environment Results

Table G-1: Summary of IDZ Marine Water Quality Results for Dioxins and Furans Received at the Time of Reporting

Parameter	Unit	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
		L2755981-4	L2755981-5	L2755981-6	L2755981-7	L2755981-8	L2755981-9
		2024-05-28 14:25	2024-05-28 14:40	2024-05-28 14:52	2024-05-28 15:10	2024-05-28 16:33	2024-05-28 16:39
Lower Bound PCDD/F TEQ	**pg/L**	0.00105	0.0	0.00937	0.0714	0.0407	0.0617

Notes:
PCDD = polychlorinated dibenzodioxins (dioxins)
PCDF = polychlorinated dibenzofurans (furans)
TEQ = toxic equivalency
Lower bound PCDD/F TEQ is the sum of the toxic equivalency results for the individual PCDD/F parameters. Non-detectable parameters are assigned a value of zero (0).

Table G-2: Summary of Reference Station Marine Water Quality Results for Dioxins and Furans Received at the Time of Reporting

Parameter	Unit	Reference Station WQR1		
		0.5 m Below Surface	2 m Below Surface	2 m Above Seafloor
		WQR1-0.5	WQR1-2m	WQR1-SF
		L2755981-1	L2755981-2	L2755981-3
		2024-05-28 17:08	2024-05-28 17:33	2024-05-28 17:47
Lower Bound PCDD/F TEQ	**pg/L**	0.0228	0.000924	0.000690

Notes:
PCDD = polychlorinated dibenzodioxins (dioxins)
PCDF = polychlorinated dibenzofurans (furans)
TEQ = toxic equivalency
Lower bound PCDD/F TEQ is the sum of the toxic equivalency results for the individual PCDD/F parameters. Non-detectable parameters are assigned a value of zero (0).

Table G-3: Summary of IDZ Marine Water Quality Results for Methylmercury Received at the Time of Reporting

Parameter	Unit	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
		VA24B2063-004	VA24B2063-005	VA24B2063-006	VA24B2063-007	VA24B2063-008	VA24B2063-009
		2024-05-28 14:25	2024-05-28 14:40	2024-05-28 14:52	2024-05-28 15:10	2024-05-28 16:33	2024-05-28 16:39
Methylmercury	**µg/L**	0.000021	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020

Table G-4: Summary of Reference Station Marine Water Quality Results for Methyl Mercury Received at the Time of Reporting

Parameter	Unit	Station WQR1		
		0.5 m Below Surface	2 m Below Surface	2 m Above Seafloor
		WQR1-0.5	WQR1-2m	WQR1-SF
		VA24B2063-001	VA24B2063-002	VA24B2063-003
		2024-05-28 17:08	2024-05-28 17:33	2024-05-28 17:47
Methylmercury	**µg/L**	<0.000020	<0.000020	<0.000020