British Columbia Energy Regulator

6534 100 Avenue, Fort St. John, B.C.
V1J 8C5

PERMIT
PE-110478

Under Provisions of the Environmental Management Act

LNG Canada Development Inc.
Suite 4000, 500 Centre Street SE
Calgary, Alberta
T2G 1A6

is authorized to Discharge treated effluent to the environment from the **LNG Canada Liquified Natural Gas (LNG) Facility** located in Block B, 103-I-02 and Unit 95, Block J, 103-H-15, near Kitimat, British Columbia, within the traditional territory of the Haisla Nation, subject to the conditions listed below. Contravention of any of these conditions is a violation of the *Environmental Management Act* and may result in prosecution.

1. DEFINITIONS

For the purpose of this permit, the following definitions apply:

1.1. ***Application*** means the "Technical Assessment Report – Facility Effluent Discharge, April 12, 2024, by Stantec Consulting Ltd.", and all the supporting documents and appendices.

1.2. ***BCER*** means the British Columbia Energy Regulator.

1.3. ***Combined Effluent*** are the combined clear rainwater, accidently contaminated, continuously contaminated, and sanitary wastewater system effluents.

1.4. ***Discharge*** means the total mass of a solid, liquid, or gaseous material introduced into the environment.

1.5. ***Early Operation*** means the period of time which begins when the start-up of at least one LNG train and associated water systems commences and ends when the first cargo is shipped from the facility.

Sean Babulic, P.Eng.
Manager, Environmental Support

1.6. ***Initial Dilution Zone (IDZ)*** means a cylinder with a maximum 75-metre radius around the authorized point of Discharge, extending from the seabed to the water surface, where mixing of the effluent and the receiving environment water occurs.

1.7. ***Operation*** means that period of time that starts when the first cargo is shipped from the facility.

1.8. ***Permittee*** means LNG Canada Development Inc.

1.9. ***Qualified Professional*** is a person who has training, experience, and expertise in a discipline relevant to the area of practice set out in the condition, and who is registered with an appropriate professional organization in British Columbia, is acting under that organization's code of ethics and is subject to disciplinary action by that organization.

1.10. ***Regulator*** means a BCER employee authorized to exercise the powers of the BCER under Section 14 of the *Environmental Management Act*.

1.11. ***Site*** means the activity area in Facility Permit (Application Determination Number 1001083612), including:

- Lot A District Lots 187 and 6050 Plan EPP67347
- Lot B District Lot 6004 Plan EPP79160
- Lot A District Lot 187 Plan EPP92698
- West 1/2 of District Lot 6003, Lot 1 District Lot 6003 Plan EPP94745
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- Lot A District Lot 94 Plan EPP92697
- Lot 1 District Lots 981, 5469 and 7940 Plan 12731
- District Lot 981 Except Block A, where the Discharge will occur to Kitimat Arm; all in Range 5 Coast District.

2. AUTHORIZED DISCHARGES

2.1. This subsection applies to the Discharges of effluent from **ONE (1) LNG Canada Facility Effluent Discharge** site. The site reference number for this Discharge is E334112.

2.1.1. The authorized point of Discharge is described as the end of two (2) effluent pipelines (Latitude 53.9920° N, Longitude 128.6783° W) at 11 metres below chart datum in Kitimat Arm.

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Manager, Environmental Support

2.1.2. The maximum authorized rate of Discharge is 6000 m^3/hour.

2.1.3. The authorized Discharge period is continuous.

2.1.4. The point of compliance means the last points for monitoring and sampling Combined Effluent, which are on the two (2) effluent pipelines downstream of the Discharge Water Pump Pit (0T-6451).

2.1.5. The source of the Discharge includes:

- Clear rainwater drainage system: Includes stormwater runoff, roof runoff, cooling tower blowdown water, tempered cooling water, reject brine from the demineralized water package, and ultrafiltration backwash water.
- Accidentally contaminated drainage system: Includes used firefighting water, wash water, cleaning water, ground water from shallow excavations / maintenance activities, impounded water from storage tank bunded areas and snow dumps, contact water from transformer yards and railyards, safety shower and eyewash stations, and non-amine contaminated surface runoff from rotating equipment at the Acid Gas Removal Units.
- Continuously contaminated drainage system: Includes drips and drains from rotating equipment and diesel storage, oil generated from maintenance activities, reverse osmosis wash water, laboratory effluent, and molecular sieve change-out / bleed water from the Acid Gas Removal Units.
- Sanitary wastewater system: Sanitary wastewater from administration and service buildings.

The authorized works and Discharge location are as shown in attached Figure 1. Receiving environment sampling locations are shown in attached Figure 2.

2.1.6. The annual average Discharge rate has been set to 2000 m^3/hour for the purpose of calculating Discharge fees as required by the Permit and Approval Fees and Charges Regulation. The actual annual Discharge volumes will vary depending on annual precipitation and operating conditions at the facility.

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Manager, Environmental Support

2.1.7. The Permittee must track the status of the daily Discharge, including Discharge rates, monitoring logs, field and laboratory sample results, field notes, field meter calibration logs, reports, and photos. Daily records shall be compiled. The Permittee shall retain such records for 3 years for inspection by the BCER.

2.1.8. The authorized works for the LNG Canada Facility drainage and effluent treatment system includes:

- Open drain concrete channels
- Underground pipes
- Sumps and curbed areas
- Storage tank diked areas
- Snow dump areas
- Controlled Discharge facility basins
- Buffer and off-spec tanks with floating oil skimmers
- Corrugated plate oil interceptors
- Waste oil tank
- Bioreactor packages
- Sludge dewatering equipment
- Multimedia filters
- Stormwater retention basins with fire water reserves
- Effluent treatment plant retention basin
- Pumps
- Effluent pipelines
- Outfall infrastructure
- Related appurtenances

he LNG Canada Facility Effluent Discharge shall meet the following criteria at the point of compliance:

- pH: 5.4 to 8.7
- Temperature: Maximum 23° C
- Total Suspended Solids (TSS): Maximum 75 mg/L
- Ammonia (Total): Maximum 10 mg/L
- Phosphorus (Total): Maximum 2 mg/L
- 5-day carbonaceous Biochemical Oxygen Demand (BOD_5): Maximum 45 mg/L
- Chemical Oxygen Demand (COD): Maximum 100 mg/L
- Extractable Petroleum Hydrocarbon (EPH): Maximum 10 mg/L
- Fecal coliforms (Total): Maximum 40 MPN/100 mL
- Residual Chlorine (Total): Maximum 0.03 mg/L
- Rainbow Trout 96 Hour Acute Lethality Test: Minimum 50% survival in 100% effluent concentration.

Except for those water quality criteria listed above, the effluent shall be free of other contaminants in concentrations that may have an adverse effect on the receiving environment. The receiving environment temperature will be monitored as per Section 4, Table 3 to confirm no more than + or – 1°C change from the natural ambient background at the edge of the IDZ.

2.1.9. The effluent shall not be discharged in a manner or quantity that impairs the proper ecological function of the receiving environment or causes excessive erosion of the seabed.

3. GENERAL REQUIREMENTS

3.1. Maintenance of Works

The Permittee shall inspect the authorized works regularly and maintain them in good working order. Records of inspection shall be maintained and made available to the BCER upon request.

3.2. Bypasses

The Discharge of contaminants, which have bypassed the authorized works, is prohibited unless the consent of the Regulator is obtained and confirmed in writing.

3.3. Process Modifications

The Permittee shall notify the Regulator prior to implementing changes to any process that may affect the quality and/or quantity of the Discharge.

3.4. Sampling Procedures

The Permittee shall carry out sampling in accordance with the procedures described in the most recent version of the "British Columbia Field Sampling Manual" or by alternative procedures as authorized by the Regulator.

3.5. Analytical Procedures

The Permittee shall carry out analyses in accordance with the procedures described in the most recent version of the "British Columbia Environmental Laboratory Manual" or by alternative procedures as authorized by the Regulator. Laboratory shall be accredited by either the Canadian Association for Laboratory Accreditation (CALA) or Standards Council of Canada (SCC).

3.6. Methods and Mitigations

The Permittee shall manage all authorized works based on the methods and any mitigations set out in the Application, unless superseded by conditions in this permit.

3.7. Permit Non-Compliance

Instances of permit non-compliance shall be self-disclosed upon discovery, as outlined in Chapter 3 of the BCER Compliance and Enforcement Manual and as amended from time to time; Waste.Management@bc-er.ca shall also be informed of the self-disclosure.

3.8. Sediment Transport Model

The Permittee shall develop a sediment transport model related to the Discharge and submit the modelling report to the BCER by December 31, 2026. The results must be described in the annual report submitted by March 31, 2027, to evaluate the adequacy of the far-field monitoring stations established in Kitimat Arm.

3.9. Combined Effluent Characterization

The Permittee must provide, no later than December 31, 2025, an effluent characterization report including parameters determined by the Regulator.

3.10. Permittee Name Change or Transfer of the Facility

Any change to the name of the Permittee, such as sale of the facility or a corporate name change, shall be reported to the BCER in writing within 30 days of the transaction.

4. SAMPLING AND MONITORING REQUIREMENTS

The Regulator may alter the monitoring requirements as needed. The need for changes to the monitoring and sampling requirements shall be based upon the reports submitted as well as any other scientific information obtained by the BCER and the Ministry of Environment & Climate Strategy (ENV) Environmental Protection Division in connection with the Discharge.

4.1. Discharge and Compliance Monitoring

4.1.1. The Permittee shall retain a Qualified Professional to implement and oversee the effluent monitoring and sampling program. The effluent monitoring and sampling program must demonstrate that the effluent Discharge meets the water quality criteria defined in Section 2.1.9.

4.1.2. Effluent monitoring shall occur at the Stormwater Retention Basins (0T-6422A/B) and Effluent Treatment Plant Retention Basin (0T-6452) for pH, chlorine, COD, ammonia, turbidity, and temperature, and visible sheen utilizing online analyzers, field measurements, and/or visible observation. Data shall be reviewed by the Permittee prior to opening outlet sluice gates and commencing Discharge. Monitoring records shall be maintained and made available to the BCER upon request.

4.1.3. Combined Effluent sampling according to Table 1 and 2 shall occur at the point of compliance.

4.1.4. If the Permittee is using or plans to use turbidity monitoring as a monitoring tool, the Permittee must develop and maintain site-specific TSS-turbidity regression curves. Annual updates to the TSS and turbidity datasets and any modifications to the regression curves must be submitted in the annual reports.

4.1.5. If, in the opinion of the Qualified Professional responsible for the effluent monitoring and sampling program, the Discharge is or is likely causing an adverse effect to the environment, the Discharge shall be immediately halted if it is safe to do so, and the Regulator shall be notified immediately at (250) 883-4958.

Table 1: Monitoring Locations and Parameters

Monitoring Sample Point	Description of Sample Point	Location		Parameter
		Latitude (° N)	Longitude (° W)	
COMBINED EFFLUENT				
Point of compliance	Sample points on the two (2) effluent pipelines	54.01590	128.68173	TABLE 2: Effluent Water Quality Monitoring and Sampling Requirements
		54.01589	128.68170	
RECEIVING ENVIRONMENT				
Point of Discharge	Outfall at the end of the two (2) effluent pipelines	53.99195	128.67830	Temperature, turbidity, and residual chlorine (4 times per year)
IDZ-N	Monitoring site, at the north edge of the IDZ	53.99264	128.67829	TABLE 3: Marine Water Quality Monitoring and Sampling Requirements for Kitimat Arm
IDZ-E	Monitoring site, at the east edge of the IDZ	53.99196	128.67716	
IDZ-S	Monitoring site, at the south edge of the IDZ	53.99129	128.67831	
IDZ-W	Monitoring site, at the west edge of the IDZ	53.99197	128.67944	TABLE 4: Marine Sediment Monitoring and Sampling Requirements for Kitimat Arm
WQ9	Far field site	53.99044	128.68275	
WQ1	Reference site – freshwater influence	53.98914	128.66482	
WQ2	Reference site – saltwater background conditions	53.98457	128.69368	TABLE 5: Marine Aquatic Biota Monitoring and Sampling Requirements for Kitimat Arm
Kitamaat Village	Reference site	53.97562	128.65805	

Notes:

- Locations are approximate and precise sample locations shall be recorded at the time of monitoring.

Sean Babulic, P.Eng.
Manager, Environmental Support

Table 2: Effluent Water Quality Monitoring and Sampling Requirements

Parameter	Unit	Sampling Frequency	
		Early Operation	Operation
FIELD PARAMETERS			
Flow[1]	m^3/s	Continuous	Continuous
Temperature	°C	Online analyzers or daily during discharge	Online analyzers or daily during discharge
Total residual chlorine[2]	mg/L		
pH	pH Units	Daily during discharge	Daily during discharge
Turbidity	NTU		
PHYSICAL AND CHEMICAL PARAMETERS[3]			
Fecal coliforms	MPN/100mL	Once every week	Once per month
Escherichia coli			
Enterococcus			
5-day carbonaceous Biochemical oxygen demand (BOD_5)	mg/L		
Chemical oxygen demand (COD)			
Extractable petroleum hydrocarbons (EPH)			
Total phosphorus			
Total ammonia	mg N/L		
Nitrate			
Hardness ($CaCO_3$)	mg/L		
Total suspended solids (TSS)			
Total organic carbon (TOC)			
Metals – dissolved & total[4]			
BTEX[5]			
Polycyclic aromatic hydrocarbons (PAH)			
Acute toxicity testing[6]	NA	Once per month	Once per year
Chronic toxicity testing of diluted effluent[7]			

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Notes:

- Combined Effluent water quality sampling to occur at the point of compliance (Table 1).
- [1]Flow measured by the flow meters (064FIQ-0251/0261) on the two (2) effluent pipelines.
- [2]Total residual chlorine measured by the online analyzers (064QISA-0251/0261) or grab samples at the point of compliance or calculated at the end of the two (2) effluent pipelines.
- [3]Effluent samples collected at point of compliance.
- [4]Metals – total and dissolved metals, including mercury
- [5]BTEX – benzene, toluene, ethylbenzene, ortho xylene, meta xylene, and para xylene.
- [6]Acute toxicity tests (Rainbow Trout (*Oncorhynchus mykiss*) 96 Hour and Daphnia (*Daphnia magna*) 48 Hour Acute Lethality Tests) will be conducted.
- [7]A marine bivalve larval development test (Mussel (*Mytilus* sp.) Embryo Larval Development Test Method) and an invertebrate fertilization test (Sea Urchin (*Strongylocentrotus purpuratus*) 20-minute Sublethal Fertilization Test) will be conducted in a series of five diluted effluent concentrations (20%, 10%, 5%, 2.5%, 1.25%). The sampling frequency during Early Operation may vary due to constraints regarding the availability of test organisms.

Date Issued: August 16, 2024
Date Amended: October 25, 2024

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Table 3: Marine Water Quality Monitoring and Sampling Requirements for Kitimat Arm

Parameter	Unit	Sampling Frequency
FIELD PARAMETERS		
pH	pH units	4 times per year (5 samples over 30 days, quarterly)
Temperature	°C	
Dissolved oxygen	mg/L	
Conductivity	µS/cm	
Salinity	ppt or %	
Total chlorine	mg/L	
PHYSICAL AND CHEMICAL PARAMETERS		
pH	pH units	4 times per year (5 samples over 30 days, quarterly)
Turbidity	NTU	
Total dissolved solids (TDS)	mg/L	
5-day carbonaceous Biochemical oxygen demand (BOD_5)		
Chemical oxygen demand (COD)		
Total suspended solids (TSS)		
Dissolved organic carbon (DOC)		
Total organic carbon (TOC)		
Hardness ($CaCO_3$)		
Total ammonia	mg N/L	
Total Kjeldahl nitrogen		
Nitrate		
Nitrite + Nitrate		
Total phosphorus	mg P/L	
Orthophosphate		
Fecal coliforms	MPN/100mL	
Escherichia coli		
Enterococcus		
Metals – dissolved & total	mg/L	
BTEX		
Polycyclic aromatic hydrocarbons (PAH)		

Notes:

- Marine water samples are collected at 3 depths: 1 m above seafloor, mid-depth between water surface and seafloor, and at 1 m below water surface. If water depth is less than 10 m, samples will be collected 1 m above seafloor and 1 m below water surface. If water depth is less than 3m, one mid-depth sample will be collected
- Metals = total and dissolved metals, including aluminum, antimony, arsenic, barium, beryllium, bismuth, boron, cadmium, calcium, chromium, cobalt, copper, iron, lead, lithium, magnesium, manganese, mercury, molybdenum, nickel, potassium, selenium, silver, sodium, strontium, thallium, tin, titanium, vanadium, and zinc.

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- BTEX = benzene, toluene, ethylbenzene, ortho-xylene, meta-xylene, and para-xyle

Table 4: Marine Sediment Monitoring and Sampling Requirements for Kitimat Arm

Parameter	Unit	Sampling Frequency
Paste pH	pH units	Once every 3 years
Particle size	% sand, silt, clay	
Total organic carbon	0.05%	
Total nitrogen	0.02%	
C:N ratio	-	
Redox potential (Eh)	mV	
Acid volatile sulphide (AVS)	mg/L	
Metals	mg/L	
Total polycyclic aromatic hydrocarbon (PAH)	0.05 mg/kg dry wt.	

Notes:

- Metals = total extractable metals including aluminium, antimony, arsenic, barium, beryllium, bismuth, boron, cadmium, calcium, chromium, cobalt, copper, iron, lead, lithium, magnesium, manganese, mercury, molybdenum, nickel, phosphorus, potassium, selenium, silver, sodium, strontium, thallium, tin, titanium, vanadium, and zinc.

Table 5: Marine Aquatic Biota Monitoring and Sampling Requirements for Kitimat Arm

Parameter	Sampling Frequency
Abundance of infauna and epifauna	Once every 3 years
Taxonomic richness (family level)	
Evenness (Simpson's evenness index)	
Similarity to reference areas (Bray-Curtis similarity index)	

Notes:

- Aquatic Biota = benthic invertebrate community

5. REPORTING REQUIREMENTS

The Regulator may alter the reporting requirements as needed. The need for changes to the reporting requirements will be based upon the results submitted as well as any other scientific information obtained by the BCER and Ministry of Environment & Climate Strategy (ENV) Environmental Protection Division in connection with the Discharges. All reports shall be prepared by a Qualified Professional and shall be submitted to Waste.Management@bc-er.ca.

All quarterly reports required by this permit are to be compiled and submitted to the BCER on or before the end of the month following the last month of the quarter in which the information was collected, unless otherwise authorized in writing by the Regulator.

The Permittee shall compile and submit all annual reports required by this permit to the Regulator on or before March 31st of the year following the year in which the information was collected, unless otherwise authorized in writing by the Regulator.

5.1. Reporting to First Nations

The Regulator may require the Permittee to submit electronic copies of reports required under Section 5 to First Nations specified by the Regulator in writing. The Permittee may exclude proprietary information that may be exempt from disclosure if the reports were disclosed pursuant to a request under the *Freedom of Information and Protection of Privacy Act*.

5.2. Reporting to Public

The Permittee shall post electronic copies of the annual reports required under Section 5.5 to the Permittee's website. The Permittee may exclude proprietary information that may be exempt from disclosure if the reports were disclosed pursuant to a request under the *Freedom of Information and Protection of Privacy Act*.

5.3. Changes to Reporting Frequency

Reporting frequency may be reduced upon a history of compliance and by written confirmation from the Regulator.

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5.4. Quarterly Reporting

Upon permit issuance, the quarterly reports shall include a summary of all authorized effluent Discharges and monitoring activities set out herein, that occurred during the previous quarter. The report shall include the following information at a minimum:

a) Tables summarizing sampling sites and monitoring frequency

b) Monthly and daily average Discharge volumes

c) Monthly precipitation data

d) Summary of sampling equipment / methodology

e) Summary of weather and tidal conditions, operating conditions, and system upsets

f) Maps illustrating sampling locations

g) Quality Assurance (QA)/Quality Control (QC) results

h) Monitoring results compared to permit effluent limits, *BC Ambient Water Quality Guidelines* (BC WQGs), and/or *Water Quality Objectives* (WQO) for Kitimat Arm as appropriate

i) Acute and chronic toxicity testing results for the quarters when such testing was conducted

j) Interpretation of the results including a discussion of trends in the effluent quality and the receiving environment relative to baseline conditions

k) A summary of permit effluent limit, BC WQGs, or WQO exceedances and actions taken. A statement indicating compliance with permit requirements.

5.5. Annual Reporting

Annual reports shall provide an overview and evaluation of the monitoring performed during the year. They provide additional review of the data and present annual summaries that highlight overall performance of the IDZ, changes at the facility, seasonal patterns, annual trends, occurrences of water quality that exceed BC WQGs, comparison to the BC WQGs and exceedances of permit limits.

The Permittee shall include the following information within the annual report:

a) Tables summarizing sampling sites and monitoring frequency

b) Annual, monthly, and daily average Discharge volumes

c) Annual and monthly precipitation data

d) Summary of sampling equipment / methodology

e) Summary of weather and tidal conditions, operating conditions, and system upsets

f) Map(s) illustrating sampling locations

g) QA/QC results

h) Outlier evaluation

i) Monitoring results compared to permit effluent limits, BC WQGs, and/or WQO for Kitimat Arm as appropriate

j) Statistical analysis of the data and supporting discussion regarding the statistical power of the analyses to detect the effect size of interest.

k) Acute and chronic toxicity testing results

l) Development and refinement of site specific TSS-turbidity relationship

m) Interpretation of the results including a discussion of trends in the effluent quality and the receiving environment relative to baseline conditions

n) Comparison of observed water quality compared with predicted water quality at the edge of the IDZ, particularly but not limited to the following parameters:
   - °C change in temperature
   - mg/L change in TSS
   - mg/L change in total nitrogen and total ammonia
   - mg/L change in total phosphorus
   - mg/L change in BOD_5
   - mg/L change in COD
   - MPN/100 mL change in microbiological parameters
   - mg/L change in residual chlorine.

o) A summary of permit effluent limit, BC WQGs, or WQO exceedances and actions taken

p) Sediment quality data and interpretation and benthic invertebrate community data and interpretation for the years when such monitoring was conducted

q) Identification of any changes to monitoring locations, monitoring methods or significant changes to monitoring equipment.

r) A statement indicating compliance with permit requirements.

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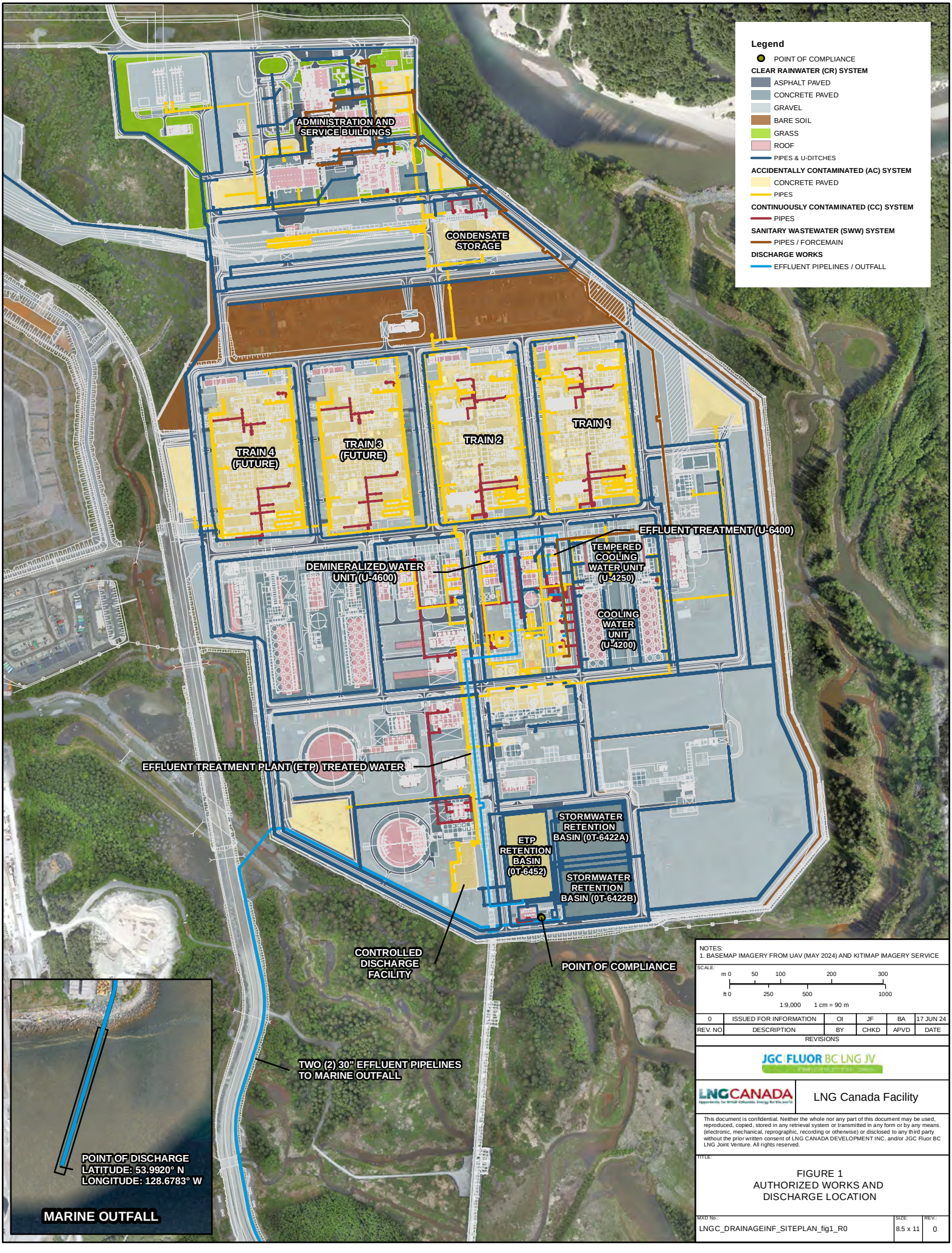


NOTES:
1. BASEMAP IMAGERY FROM UAV (MAY 2024) AND KITIMAP IMAGERY SERVICE

SCALE:
m 0 50 100 200 300
ft 0 250 500 1000
1:9,000 1 cm = 90 m

REV. NO	DESCRIPTION	BY	CHKD	APVD	DATE
0	ISSUED FOR INFORMATION	OI	JF	BA	17 JUN 24

REVISIONS

JGC | FLUOR BC LNG JV

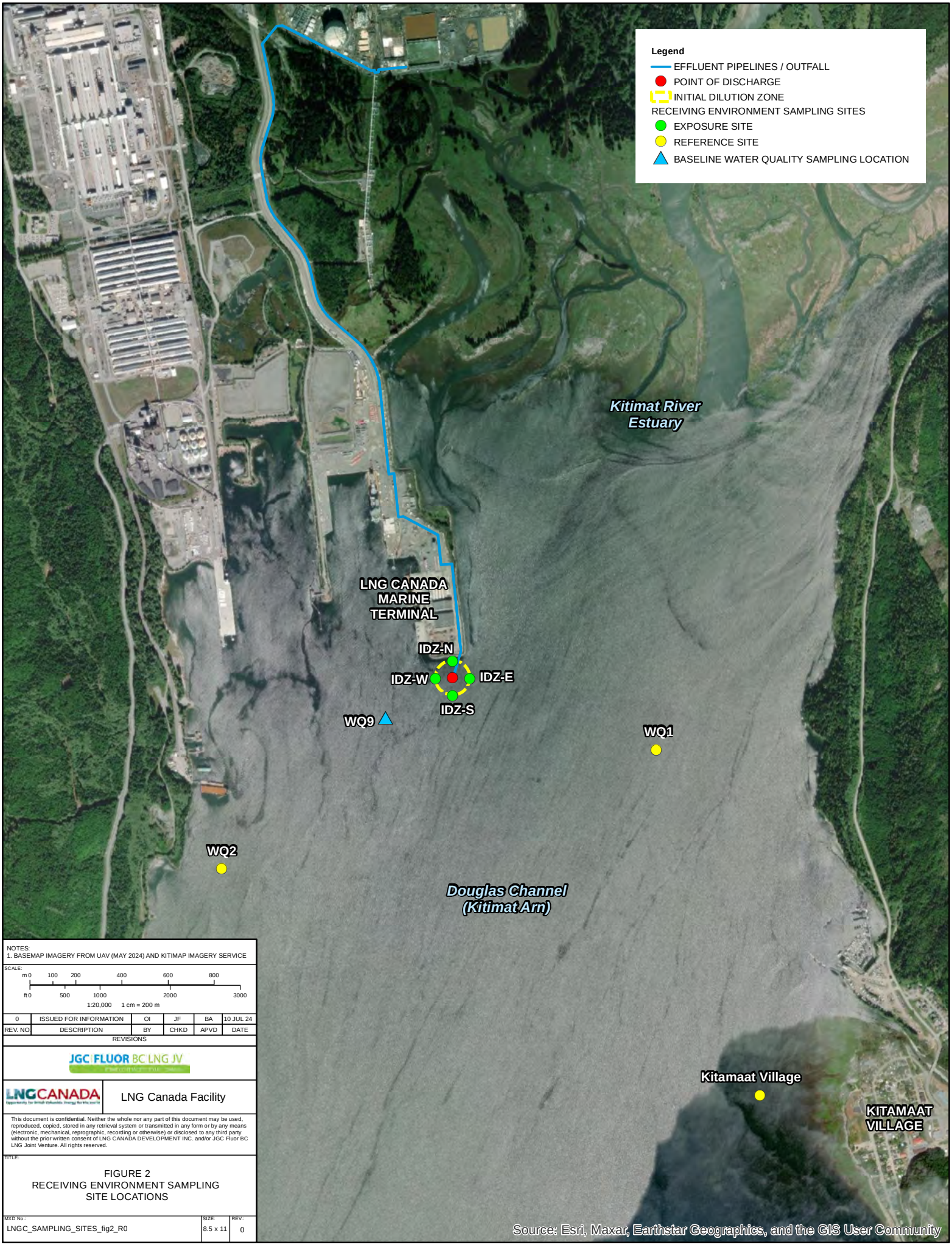
LNGCANADA

LNG Canada Facility

TITLE:

FIGURE 1
AUTHORIZED WORKS AND DISCHARGE LOCATION

MXD No.:	SIZE:	REV.:
LNGC_DRAINAGEINF_SITEPLAN_fig1_R0	8.5 x 11	0



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SCALE:
m 0 100 200 400 600 800
ft 0 500 1000 2000 3000
1:20,000 1 cm = 200 m

REV. NO	DESCRIPTION	BY	CHKD	APVD	DATE
REVISIONS					
0	ISSUED FOR INFORMATION	OI	JF	BA	10 JUL 24

JGC | FLUOR BC LNG JV

LNG CANADA

LNG Canada Facility

TITLE:

FIGURE 2
RECEIVING ENVIRONMENT SAMPLING SITE LOCATIONS

MXD No.:	SIZE:	REV.:
LNGC_SAMPLING_SITES_fig2_R0	8.5 x 11	0

British Columbia Energy Regulator

6534 100 Avenue, Fort St. John, B.C.
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Suite 4000, 500 Centre Street SE
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- Clear rainwater drainage system: Includes stormwater runoff, roof runoff, cooling tower blowdown water, tempered cooling water, reject brine from the demineralized water package, and ultrafiltration backwash water.
- Accidentally contaminated drainage system: Includes used firefighting water, wash water, cleaning water, ground water from shallow excavations / maintenance activities, impounded water from storage tank bunded areas and snow dumps, contact water from transformer yards and railyards, safety shower and eyewash stations, and non-amine contaminated surface runoff from rotating equipment at the Acid Gas Removal Units.
- Continuously contaminated drainage system: Includes drips and drains from rotating equipment and diesel storage, oil generated from maintenance activities, reverse osmosis wash water, laboratory effluent, and molecular sieve change-out / bleed water from the Acid Gas Removal Units.
- Sanitary wastewater system: Sanitary wastewater from administration and service buildings.

The authorized works and Discharge location are as shown in attached Figure 1. Receiving environment sampling locations are shown in attached Figure 2.

2.1.6. The annual average Discharge rate has been set to 2000 m^3/hour for the purpose of calculating Discharge fees as required by the Permit and Approval Fees and Charges Regulation. The actual annual Discharge volumes will vary depending on annual precipitation and operating conditions at the facility.

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2.1.7. The Permittee must track the status of the daily Discharge, including Discharge rates, monitoring logs, field and laboratory sample results, field notes, field meter calibration logs, reports, and photos. Daily records shall be compiled. The Permittee shall retain such records for 3 years for inspection by the BCER.

2.1.8. The authorized works for the LNG Canada Facility drainage and effluent treatment system includes:

- Open drain concrete channels
- Underground pipes
- Sumps and curbed areas
- Storage tank diked areas
- Snow dump areas
- Controlled Discharge facility basins
- Buffer and off-spec tanks with floating oil skimmers
- Corrugated plate oil interceptors
- Waste oil tank
- Bioreactor packages
- Sludge dewatering equipment
- Multimedia filters
- Stormwater retention basins with fire water reserves
- Effluent treatment plant retention basin
- Pumps
- Effluent pipelines
- Outfall infrastructure
- Related appurtenances

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2.1.9. The LNG Canada Facility Effluent Discharge shall meet the following criteria at the point of compliance:

- pH: 5.4 to 8.7
- Temperature: Maximum 23° C
- Total Suspended Solids (TSS): Maximum 75 mg/L
- Ammonia (Total): Maximum 10 mg/L
- Phosphorus (Total): Maximum 2 mg/L
- 5-day carbonaceous Biochemical Oxygen Demand (BOD_5): Maximum 45 mg/L
- Chemical Oxygen Demand (COD): Maximum 100 mg/L
- Extractable Petroleum Hydrocarbon (EPH): Maximum 10 mg/L
- Coliform Bacteria (Total): Maximum 40 MPN/100 mL
- Residual Chlorine (Total): Maximum 0.03 mg/L
- Rainbow Trout 96 Hour Acute Lethality Test: Minimum 50% survival in 100% effluent concentration.

Except for those water quality criteria listed above, the effluent shall be free of other contaminants in concentrations that may have an adverse effect on the receiving environment. The receiving environment temperature will be monitored as per Section 4, Table 3 to confirm no more than + or – 1°C change from the natural ambient background at the edge of the IDZ.

2.1.10. The effluent shall not be discharged in a manner or quantity that impairs the proper ecological function of the receiving environment or causes excessive erosion of the seabed.

3. GENERAL REQUIREMENTS

3.1. Maintenance of Works

The Permittee shall inspect the authorized works regularly and maintain them in good working order. Records of inspection shall be maintained and made available to the BCER upon request.

3.2. Bypasses

The Discharge of contaminants, which have bypassed the authorized works, is prohibited unless the consent of the Regulator is obtained and confirmed in writing.

3.3. Process Modifications

The Permittee shall notify the Regulator prior to implementing changes to any process that may affect the quality and/or quantity of the Discharge.

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3.4. Sampling Procedures

The Permittee shall carry out sampling in accordance with the procedures described in the most recent version of the "British Columbia Field Sampling Manual" or by alternative procedures as authorized by the Regulator.

3.5. Analytical Procedures

The Permittee shall carry out analyses in accordance with the procedures described in the most recent version of the "British Columbia Environmental Laboratory Manual" or by alternative procedures as authorized by the Regulator. Laboratory shall be accredited by the Canadian Association for Laboratory Accreditation (CALA).

3.6. Methods and Mitigations

The Permittee shall manage all authorized works based on the methods and any mitigations set out in the Application, unless superseded by conditions in this permit.

3.7. Permit Non-Compliance

Instances of permit non-compliance shall be self-disclosed upon discovery, as outlined in Chapter 3 of the BCER Compliance and Enforcement Manual and as amended from time to time; Waste.Management@bc-er.ca shall also be informed of the self-disclosure.

3.8. Sediment Transport Model

The Permittee shall develop a sediment transport model related to the Discharge and submit the modelling report to the BCER by December 31, 2026. The results must be described in the annual report submitted by March 31, 2027, to evaluate the adequacy of the far-field monitoring stations established in Kitimat Arm.

3.9. Combined Effluent Characterization

The Permittee must provide, no later than December 31, 2025, an effluent characterization report including parameters determined by the Regulator.

3.10. Permittee Name Change or Transfer of the Facility

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Any change to the name of the Permittee, such as sale of the facility or a corporate name change, shall be reported to the BCER in writing within 30 days of the transaction.

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4. SAMPLING AND MONITORING REQUIREMENTS

The Regulator may alter the monitoring requirements as needed. The need for changes to the monitoring and sampling requirements shall be based upon the reports submitted as well as any other scientific information obtained by the BCER and the Ministry of Environment & Climate Strategy (ENV) Environmental Protection Division in connection with the Discharge.

4.1. Discharge and Compliance Monitoring

4.1.1. The Permittee shall retain a Qualified Professional to implement and oversee the effluent monitoring and sampling program. The effluent monitoring and sampling program must demonstrate that the effluent Discharge meets the water quality criteria defined in Section 2.1.9.

4.1.2. Effluent monitoring shall occur at the Stormwater Retention Basins (0T-6422A/B) and Effluent Treatment Plant Retention Basin (0T-6452) for pH, chlorine, COD, ammonia, turbidity, and temperature, and visible sheen utilizing online analyzers, field measurements, and/or visible observation. Data shall be reviewed by the Permittee prior to opening outlet sluice gates and commencing Discharge. Monitoring records shall be maintained and made available to the BCER upon request.

4.1.3. Combined Effluent sampling according to Table 1 and 2 shall occur at the point of compliance.

4.1.4. If the Permittee is using or plans to use turbidity monitoring as a monitoring tool, the Permittee must develop and maintain site-specific TSS-turbidity regression curves. Annual updates to the TSS and turbidity datasets and any modifications to the regression curves must be submitted in the annual reports.

4.1.5. If, in the opinion of the Qualified Professional responsible for the effluent monitoring and sampling program, the Discharge is or is likely causing an adverse effect to the environment, the Discharge shall be immediately halted if it is safe to do so, and the Regulator shall be notified immediately at (250) 883-4958.

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Table 1: Monitoring Locations and Parameters

Monitoring Sample Point	Description of Sample Point	Location		Parameter
		Latitude (° N)	Longitude (° W)	
COMBINED EFFLUENT				
Point of compliance	Sample points on the two (2) effluent pipelines	54.01590	128.68173	TABLE 2: Effluent Water Quality Monitoring and Sampling Requirements
		54.01589	128.68170	
RECEIVING ENVIRONMENT				
Point of Discharge	Outfall at the end of the two (2) effluent pipelines	53.99195	128.67830	Temperature, turbidity, and residual chlorine (4 times per year)
IDZ-N	Monitoring site, at the north edge of the IDZ	53.99264	128.67829	TABLE 3: Marine Water Quality Monitoring and Sampling Requirements for Kitimat Arm
IDZ-E	Monitoring site, at the east edge of the IDZ	53.99196	128.67716	
IDZ-S	Monitoring site, at the south edge of the IDZ	53.99129	128.67831	
IDZ-W	Monitoring site, at the west edge of the IDZ	53.99197	128.67944	TABLE 4: Marine Sediment Monitoring and Sampling Requirements for Kitimat Arm
WQ9	Far field site	53.99044	128.68275	
WQ1	Reference site – freshwater influence	53.98914	128.66482	
WQ2	Reference site – saltwater background conditions	53.98457	128.69368	TABLE 5: Marine Aquatic Biota Monitoring and Sampling Requirements for Kitimat Arm
Kitamaat Village	Reference site	53.97562	128.65805	

Notes:

- Locations are approximate and precise sample locations shall be recorded at the time of monitoring.

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Table 2: Effluent Water Quality Monitoring and Sampling Requirements

Parameter	Unit	Sampling Frequency	
		Early Operation	Operation
FIELD PARAMETERS			
Flow[1]	m^3/s	Continuous	Continuous
Temperature	°C	Online analyzers or daily during discharge	Online analyzers or daily during discharge
Total residual chlorine[2]	mg/L		
pH	pH Units	Daily during discharge	Daily during discharge
Turbidity	NTU		
PHYSICAL AND CHEMICAL PARAMETERS[3]			
Total coliforms	MPN/100mL	Once every week	Once per month
Escherichia coli			
Fecal coliforms			
Enterococcus			
5-day carbonaceous Biochemical oxygen demand (BOD_5)	mg/L		
Chemical oxygen demand (COD)			
Extractable petroleum hydrocarbons (EPH)			
Total phosphorus			
Total ammonia	mg N/L		
Nitrate			
Hardness ($CaCO_3$)	mg/L		
Total suspended solids (TSS)			
Total organic carbon (TOC)			
Metals – dissolved & total[4]			
BTEX[5]			
Polycyclic aromatic hydrocarbons (PAH)			
Acute toxicity testing[6]	NA	Once per month	Once per year
Chronic toxicity testing of diluted effluent[7]			

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Notes:

- Combined Effluent water quality sampling to occur at the point of compliance (Table 1).
- [1]Flow measured by the flow meters (064FIQ-0251/0261) on the two (2) effluent pipelines.
- [2]Total residual chlorine measured by the online analyzers (064QISA-0251/0261) or grab samples at the point of compliance or calculated at the end of the two (2) effluent pipelines.
- [3]Effluent samples collected at point of compliance.
- [4]Metals – total and dissolved metals, including mercury
- [5]BTEX – benzene, toluene, ethylbenzene, ortho xylene, meta xylene, and para xylene.
- [6]Acute toxicity tests (Rainbow Trout (*Oncorhynchus mykiss*) 96 Hour and Daphnia (*Daphnia magna*) 48 Hour Acute Lethality Tests) will be conducted.
- [7]A marine bivalve larval development test (Mussel (*Mytilus* sp.) Embryo Larval Development Test Method) and an invertebrate fertilization test (Sea Urchin (*Strongylocentrotus purpuratus*) 20-minute Sublethal Fertilization Test) will be conducted in a series of five diluted effluent concentrations (20%, 10%, 5%, 2.5%, 1.25%). The sampling frequency during Early Operation may vary due to constraints regarding the availability of test organisms.

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Table 3: Marine Water Quality Monitoring and Sampling Requirements for Kitimat Arm

Parameter	Unit	Sampling Frequency
FIELD PARAMETERS		
pH	pH units	4 times per year (5 samples over 30 days, quarterly)
Temperature	°C	
Dissolved oxygen	mg/L	
Conductivity	µS/cm	
Salinity	ppt or %	
Total chlorine	mg/L	
PHYSICAL AND CHEMICAL PARAMETERS		
pH	pH units	4 times per year (5 samples over 30 days, quarterly)
Turbidity	NTU	
Total dissolved solids (TDS)	mg/L	
5-day carbonaceous Biochemical oxygen demand (BOD_5)		
Chemical oxygen demand (COD)		
Total suspended solids (TSS)		
Dissolved organic carbon (DOC)		
Total organic carbon (TOC)		
Hardness ($CaCO_3$)		
Total ammonia	mg N/L	
Total Kjeldahl nitrogen		
Nitrate		
Nitrite + Nitrate		
Total phosphorus	mg P/L	
Orthophosphate		
Total coliform	MPN/100mL	
Metals – dissolved & total	mg/L	
BTEX		
Polycyclic aromatic hydrocarbons (PAH)		

Notes:

- Marine water samples are collected at 3 depths: 1 m above seafloor, mid-depth between water surface and seafloor, and at 1 m below water surface. If water depth is less than 10 m, samples will be collected 1 m above seafloor and 1 m below water surface. If water depth is less than 3m, one mid-depth sample will be collected
- Metals = total and dissolved metals, including aluminum, antimony, arsenic, barium, beryllium, bismuth, boron, cadmium, calcium, chromium, cobalt, copper, iron, lead, lithium, magnesium, manganese, mercury, molybdenum, nickel, potassium, selenium, silver, sodium, strontium, thallium, tin, titanium, vanadium, and zinc.
- BTEX = benzene, toluene, ethylbenzene, ortho-xylene, meta-xylene, and para-xyle

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Table 4: Marine Sediment Monitoring and Sampling Requirements for Kitimat Arm

Parameter	Unit	Sampling Frequency
Paste pH	pH units	Once every 3 years
Particle size	% sand, silt, clay	
Total organic carbon	0.05%	
Total nitrogen	0.02%	
C:N ratio	-	
Redox potential (Eh)	mV	
Acid volatile sulphide (AVS)	mg/L	
Metals	mg/L	
Total polycyclic aromatic hydrocarbon (PAH)	0.05 mg/kg dry wt.	

Notes:

- Metals = total extractable metals including aluminium, antimony, arsenic, barium, beryllium, bismuth, boron, cadmium, calcium, chromium, cobalt, copper, iron, lead, lithium, magnesium, manganese, mercury, molybdenum, nickel, phosphorus, potassium, selenium, silver, sodium, strontium, thallium, tin, titanium, vanadium, and zinc.

Table 5: Marine Aquatic Biota Monitoring and Sampling Requirements for Kitimat Arm

Parameter	Sampling Frequency
Abundance of infauna and epifauna	Once every 3 years
Taxonomic richness (family level)	
Evenness (Simpson's evenness index)	
Similarity to reference areas (Bray-Curtis similarity index)	

Notes:

- Aquatic Biota = benthic invertebrate community

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5. REPORTING REQUIREMENTS

The Regulator may alter the reporting requirements as needed. The need for changes to the reporting requirements will be based upon the results submitted as well as any other scientific information obtained by the BCER and Ministry of Environment & Climate Strategy (ENV) Environmental Protection Division in connection with the Discharges. All reports shall be prepared by a Qualified Professional and shall be submitted to Waste.Management@bc-er.ca.

All quarterly reports required by this permit are to be compiled and submitted to the BCER on or before the end of the month following the last month of the quarter in which the information was collected, unless otherwise authorized in writing by the Regulator.

The Permittee shall compile and submit all annual reports required by this permit to the Regulator on or before March 31st of the year following the year in which the information was collected, unless otherwise authorized in writing by the Regulator.

5.1. Reporting to First Nations

The Regulator may require the Permittee to submit electronic copies of reports required under Section 5 to First Nations specified by the Regulator in writing. The Permittee may exclude proprietary information that may be exempt from disclosure if the reports were disclosed pursuant to a request under the *Freedom of Information and Protection of Privacy Act*.

5.2. Reporting to Public

The Permittee shall post electronic copies of the annual reports required under Section 5.5 to the Permittee's website. The Permittee may exclude proprietary information that may be exempt from disclosure if the reports were disclosed pursuant to a request under the *Freedom of Information and Protection of Privacy Act*.

5.3. Changes to Reporting Frequency

Reporting frequency may be reduced upon a history of compliance and by written confirmation from the Regulator.

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5.4. Quarterly Reporting

Upon permit issuance, the quarterly reports shall include a summary of all authorized effluent Discharges and monitoring activities set out herein, that occurred during the previous quarter. The report shall include the following information at a minimum:

a) Tables summarizing sampling sites and monitoring frequency

b) Monthly and daily average Discharge volumes

c) Monthly precipitation data

d) Summary of sampling equipment / methodology

e) Summary of weather and tidal conditions, operating conditions, and system upsets

f) Maps illustrating sampling locations

g) Quality Assurance (QA)/Quality Control (QC) results

h) Monitoring results compared to permit effluent limits, *BC Ambient Water Quality Guidelines* (BC WQGs), and/or *Water Quality Objectives* (WQO) for Kitimat Arm as appropriate

i) Acute and chronic toxicity testing results for the quarters when such testing was conducted

j) Interpretation of the results including a discussion of trends in the effluent quality and the receiving environment relative to baseline conditions

k) A summary of permit effluent limit, BC WQGs, or WQO exceedances and actions taken. A statement indicating compliance with permit requirements.

5.5. Annual Reporting

Annual reports shall provide an overview and evaluation of the monitoring performed during the year. They provide additional review of the data and present annual summaries that highlight overall performance of the IDZ, changes at the facility, seasonal patterns, annual trends, occurrences of water quality that exceed BC WQGs, comparison to the BC WQGs and exceedances of permit limits.

The Permittee shall include the following information within the annual report:

a) Tables summarizing sampling sites and monitoring frequency

b) Annual, monthly, and daily average Discharge volumes

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c) Annual and monthly precipitation data

d) Summary of sampling equipment / methodology

e) Summary of weather and tidal conditions, operating conditions, and system upsets

f) Map(s) illustrating sampling locations

g) QA/QC results

h) Outlier evaluation

i) Monitoring results compared to permit effluent limits, BC WQGs, and/or WQO for Kitimat Arm as appropriate

j) Statistical analysis of the data and supporting discussion regarding the statistical power of the analyses to detect the effect size of interest.

k) Acute and chronic toxicity testing results

l) Development and refinement of site specific TSS-turbidity relationship

m) Interpretation of the results including a discussion of trends in the effluent quality and the receiving environment relative to baseline conditions

n) Comparison of observed water quality compared with predicted water quality at the edge of the IDZ, particularly but not limited to the following parameters:
   - °C change in temperature
   - mg/L change in TSS
   - mg/L change in total nitrogen and total ammonia
   - mg/L change in total phosphorus
   - mg/L change in BOD_5
   - mg/L change in COD
   - MPN/100 mL change in microbiological parameters
   - mg/L change in residual chlorine.

o) A summary of permit effluent limit, BC WQGs, or WQO exceedances and actions taken

p) Sediment quality data and interpretation and benthic invertebrate community data and interpretation for the years when such monitoring was conducted

q) Identification of any changes to monitoring locations, monitoring methods or significant changes to monitoring equipment.

r) A statement indicating compliance with permit requirements.

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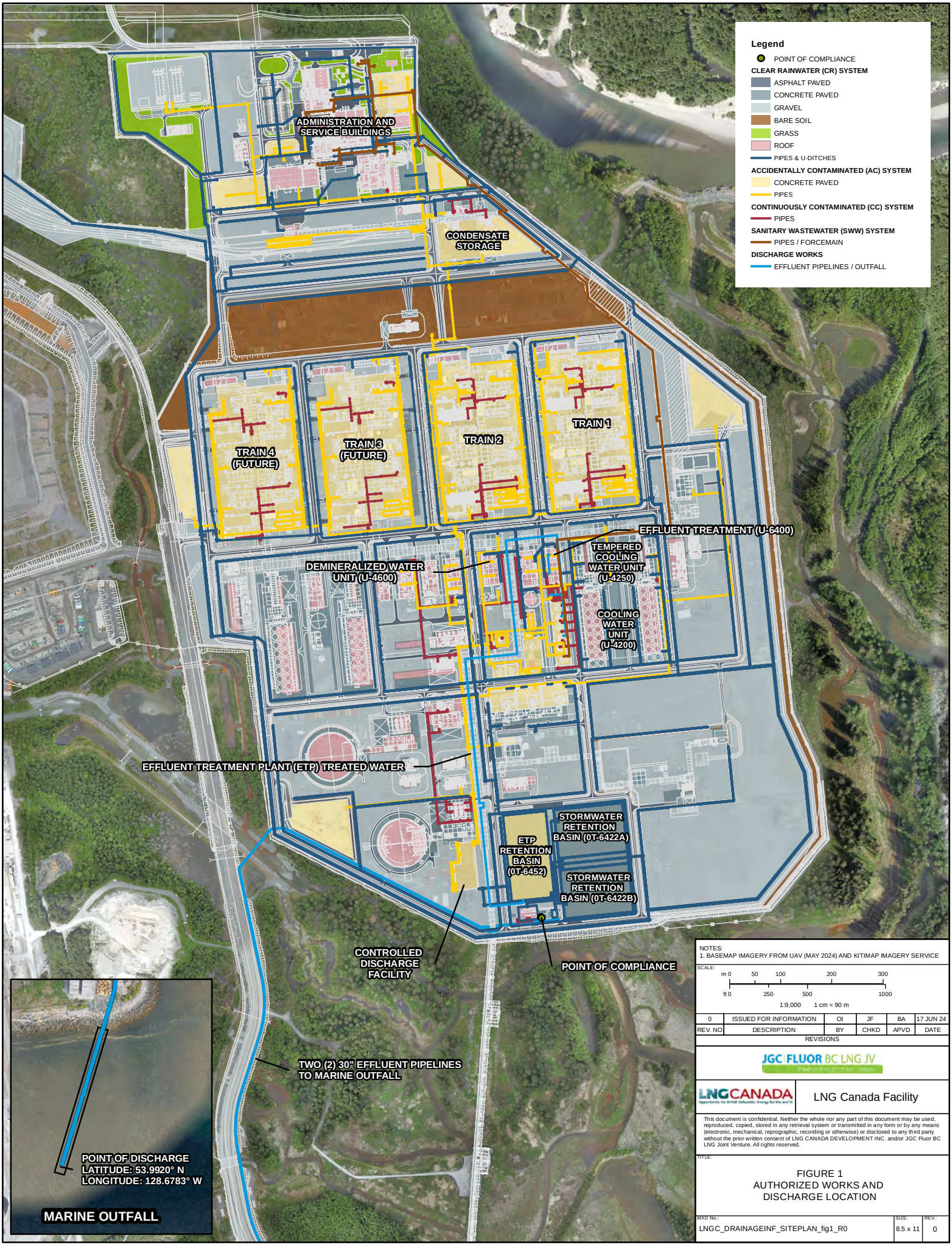


NOTES:
1. BASEMAP IMAGERY FROM UAV (MAY 2024) AND KITIMAP IMAGERY SERVICE

SCALE:
m 0 50 100 200 300
ft 0 250 500 1000
1:9,000 1 cm = 90 m

REV. NO	DESCRIPTION	BY	CHKD	APVD	DATE
0	ISSUED FOR INFORMATION	OI	JF	BA	17 JUN 24

REVISIONS

JGC | FLUOR BC LNG JV

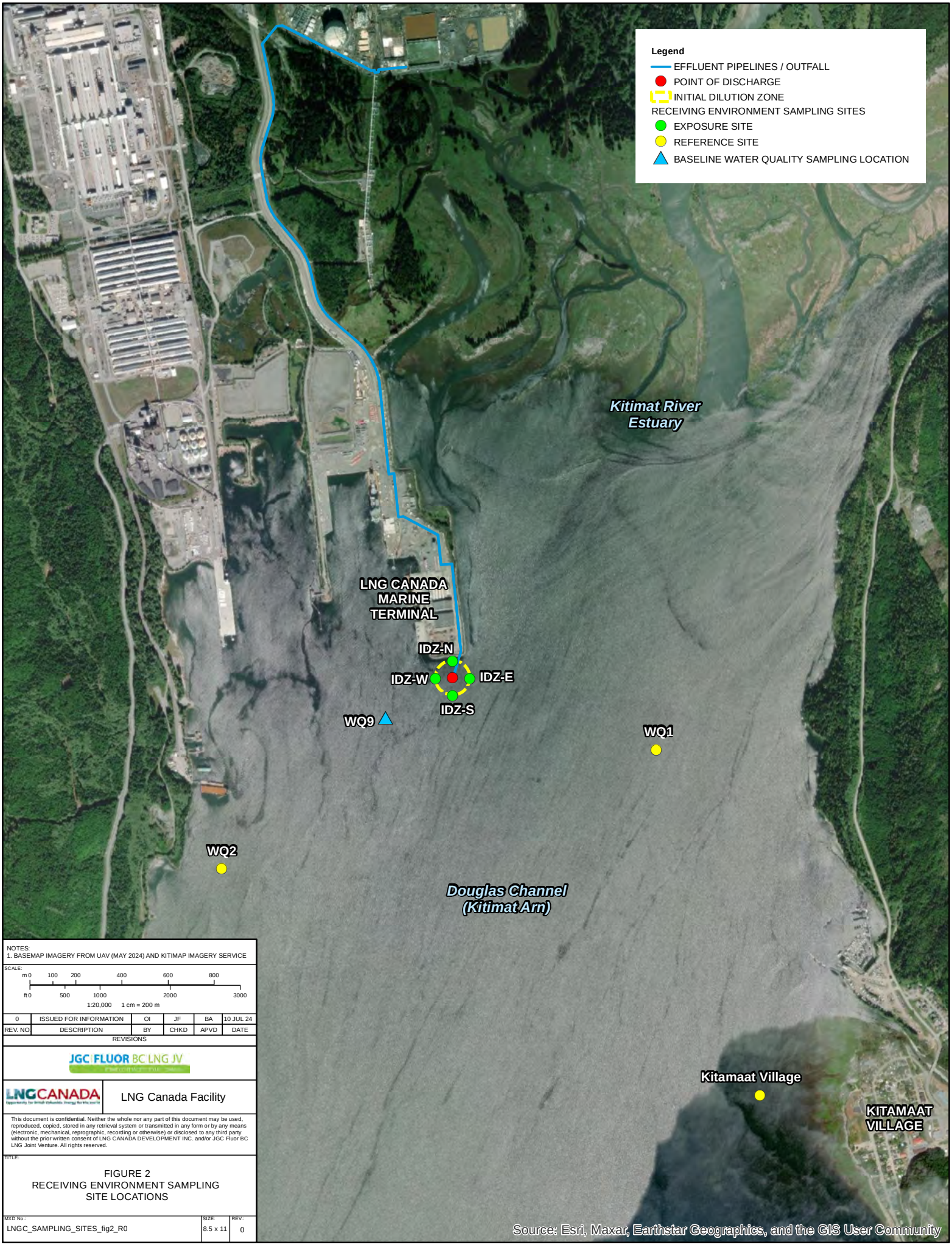
LNGCANADA

LNG Canada Facility

TITLE:

FIGURE 1
AUTHORIZED WORKS AND DISCHARGE LOCATION

MXD No.:	SIZE:	REV.:
LNGC_DRAINAGEINF_SITEPLAN_fig1_R0	8.5 x 11	0



NOTES:
1. BASEMAP IMAGERY FROM UAV (MAY 2024) AND KITIMAP IMAGERY SERVICE

SCALE:
m 0 100 200 400 600 800
ft 0 500 1000 2000 3000
1:20,000 1 cm = 200 m

REV. NO	DESCRIPTION	BY	CHKD	APVD	DATE
REVISIONS					
0	ISSUED FOR INFORMATION	OI	JF	BA	10 JUL 24

JGC | FLUOR BC LNG JV

LNG CANADA

LNG Canada Facility

TITLE:

FIGURE 2
RECEIVING ENVIRONMENT SAMPLING SITE LOCATIONS

MXD No.:	SIZE:	REV.:
LNGC_SAMPLING_SITES_fig2_R0	8.5 x 11	0