



# B2D2 Project

## Lynn Creek Estuary

### Construction Environmental Management Plan

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PLAN-B2D2-0010

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## ACRONYMS AND DEFINITIONS

ACRONYM	DEFINITION
AISR	Aquatic Invasive Species Regulations
B2	Berth 2
B2 Project	B2 Shiploader Project
B2D2 Project	Berth 2 Shiploader Replacement Project and Dumper 2 Potash Replacement Project
BC	British Columbia
BC ENV	Ministry of Environmental and Climate Change Strategy
BC HWR	Hazardous Waste Regulations
BC SRR	BC Spill Report Regulations
BMPs	Best Management Practices
CCME	Canadian Council of Ministers of the Environment
CD	Chart Datum
CEMP	Construction Environmental Management Plan
CEPA	<i>Canadian Environmental Protection Act, 1999</i>
CMA	<i>Canadian Marine Act</i>
CNWA	<i>Canadian Navigable Waters Act</i>
D2	Potash Dumper 2
D2 Project	Dumper 2 Potash Replacement Project
DFO	Fisheries and Oceans Canada
DFO-FFHPP	Fisheries and Oceans Canada Fisheries and Fish Habitat Protection Program
DPC	Director of People & Community
EcoLogic	EcoLogic Consultants Ltd.
EI	Environmental Inspector
EM	Environmental Monitor
FAA	<i>Fisheries Act</i> Authorization
HADD	Harmful alteration, disruption or destruction of fish habitat
Hatfield	Hatfield Consultants LLP
HWL	High Water Line
IAA	<i>Impact Assessment Act</i>
IAAC	Impact Assessment Agency of Canada
KWL	Kerr Wood Leidal
LCE	Lynn Creek Estuary
LCE CCEMP	Lynn Creek Estuary Contractor Construction Environmental Management Plan
LCE CEMP	Lynn Creek Estuary Construction Environmental Management Plan
MMR	Marine Mammal Regulations
Musqueam	Musqueam Indian Band
NBT	Neptune Bulk Terminals (CANADA) Ltd.
NHC	Northwest Hydraulic Consultants Ltd.
NSSK	North Shore Streamkeepers



ACRONYM	DEFINITION
NTU	nephelometric turbidity units
PER	Project and Environmental Review
QP	Qualified Professional
the Port Authority	Vancouver Fraser Port Authority
the Terminal	Located at 1001 Low Level Road, in the City of North Vancouver, British Columbia (BC) is a bulk materials handling venture of Canpotex and Teck Resources Ltd.
RAs	Regulatory Authorities
SAR	Species at Risk
SARA	<i>Species at Risk Act</i>
SDS	Safety Data Sheet
Squamish	Squamish Nation
Tsleil-Waututh	Tsleil-Waututh Nation
VanPile	Vancouver Pile Driving Ltd.
WHMIS	Workplace Hazardous Materials Information System
WQG	Water Quality Guidelines
WQO	Water Quality Objectives



# 1 INTRODUCTION

## 1.1 Neptune Bulk Terminals

Neptune Bulk Terminals (Canada) Ltd. (NBT) is a bulk materials handling venture of Canpotex Ltd. and Teck Resources Ltd. (the Terminal). The Terminal is located at approximately 49° 18.218'N, 123° 2.913'W, on the north shore of Vancouver Harbour in Burrard Inlet's Inner Harbour and is approximately 2.5 km northwest from the Second Narrows Bridge (Figure 1-1). The Terminal is located in the Vancouver Fraser Port Authority (the Port Authority) jurisdiction and is operated under tenancy by NBT.

## 1.2 Background

NBT is undertaking end of life replacement of several of its assets. The Berth 2 Shiploader Project (B2 Project) and the Dumper 2 Potash Replacement Project (D2 Project), collectively referred to as the B2D2 Project, are considered maintenance works to facilitate ongoing operations. Given the entirely land-based nature of the D2 Project, the B2 and D2 Projects underwent regulatory review and permitting separately. The B2 Project is currently being reviewed as a Category C permit through the Port Authority (PER 21-068). The D2 Project was authorized by the Port Authority under a Category B permit which was issued on October 6, 2022 (PER 21-172).

A *Fisheries Act* Authorization (FAA) from Fisheries and Oceans Canada Fish and Fish Habitat Protection Program (DFO-FFHPP) is required for the B2 Project which requires an Offsetting Plan. The Offsetting Plan is designed around a habitat restoration project in the Lynn Creek Estuary (LCE) (hereafter referred to as the LCE Offset Project). Hatfield Consultants LLP (Hatfield) and Northwest Hydraulic Consultants Ltd. (NHC) have been contracted to support the regulatory and design components for the Offsetting Plan. The offsetting for the B2 Project will be permitted through the Port Authority as a component of the B2 Category C application (PER 21-068).

The objective of the LCE Construction Environmental Management Plan (CEMP) is to support environmental compliance for the LCE Offset Project in LCE, by defining both general and specific environmental requirements and providing methods to facilitate the attainment of those environmental requirements.

## 1.3 Project Scope and Purpose

The LCE Offset Project is a habitat restoration project designed to meet the offsetting requirements of the B2 FAA. The LCE Offset Project is designed to create high value habitat for fish by introducing a complex intertidal and subtidal rocky reef within the LCE (NHC, 2023b). The design of the rock reef will include larger rock placed as a berm in deeper waters to contain smaller material. Construction will be undertaken with marine-based equipment and is further described in Section 3.3.



#### 1.4 Lynn Creek Estuary Offset Project Location

Lynn Creek originates in Lynn Headwaters Regional Park in North Vancouver, British Columbia (BC) . The creek flows south-southeast for about 18 km before draining into Burrard Inlet, at approximately 49° 17.929'N, 123° 2.417'W, between the Vancouver Pile Driving Ltd. (VanPile) work yard and Lynnterm Terminal (Lynnterm), near Harbourview Park (Figure 1-2). The LCE Offset Project is located entirely within the Port Authority managed federal lands that are designated as a conservation area (Figure 1-2).





**LEGEND:**

- ROV Survey Area
- LCE Offset Project
- Port Authority Conservation Area
- B2 Project Footprint

**Depth**

5.0 m Contour

**SOURCE / NOTE:**

- ROV survey area, LCE study area, Hatfield 2022
- Contours generated using depth points provided by Neptune Terminals in December 2022, Hatfield 2022. Contours have been adjusted to chart datum using a +3.0 m offset.
- Conservation area, VFPA 2023.
- B2 project footprint, digitized by Hatfield (2023) using Drawing No. 20230328-002, Rev: A "Berth 2 and Lynn Creek Estuary Project Location and Footprint", Neptune Bulk Terminals, March 2023.
- Background, Orthophoto 10 cm, 13 April 2021, Esri Online Service.

REV	YYYY-MM-DD	DESCRIPTION	DRAWN	APPROVED
ISSUES/REVISIONS				

**VENDOR:**

ISSUED AS RECORD COPY (YES/NO) NO

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**TITLE:**  
Overview map and Lynn Creek Estuary Study Area

**Figure 1-1**

<b>SCALE:</b>	<b>SHEET</b>	<b>OF</b>	<b>DRAWING NO.</b>	<b>REV:</b>
	1	1		A

497,000

497,100

497,200

5,460,800

5,460,700



**LEGEND:**

5.0 m Contour	ROV Survey Area	Habitat Restoration (2014 - 2016)
0.5 m Contour	LCE Offset Project	Approximate Lynn Creek Estuary Offset Project Location
	Port Authority Conservation Area	Boulder Augmentation (2020)

**SOURCE / NOTE:**

- ROV survey area, study area, Hatfield 2022.
- Contours generated using depth points provided by Neptune Terminals in December 2022, Hatfield 2022. Contours have been adjusted to chart datum using a +3.0 m offset.
- Conservation area, VFPA 2023.
- Habitat restoration, created from "Restoring fish habitat in the Lynn Creek Estuary" District of Vancouver, Hatfield 2023.
- Approximate Lynn Creek Estuary Offsetting Location, boulder augmentation, NHC 2023.
- Background, Orthophoto 10 cm, 13 April 2021, Esri Online Service.

REV	YYYY-MM-DD	DESCRIPTION	DRAWN	APPROVED
ISSUES/REVISIONS				

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TITLE: Lynn Creek Estuary Study Area				<b>Figure 1-2</b>
SCALE:	SHEET 1	OF 1	DRAWING NO.	
REV: A				

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## 1.5 Project Setting

Lower Lynn Creek and the LCE have been modified from their original state due to industrial development, historical channelization, dredging, and riprap armouring. A rock wall spit comprised of rip rap and cobbles divides the VanPile water lot from the west side of the LCE. South of the LCE Offset Project footprint is the Lynnterm dock that is supported above the water line by many cylindrical steel piles (Figure 1-2).

### 1.5.1 Terrestrial Setting

The estuary channel is approximately 55 m wide at the top-of-bank, with the wetted channel substantially narrower at low flows and low tides (NHC, 2023b). The banks are generally 3 m to 5 m high and are for the most part riprapped with 600 to 900 mm angular rock (NHC, 2023b). The riprap tends to be loosely interlocked.

The LCE has been modified from its original state, mainly due to the industrial development in the surrounding area. The terrestrial and riparian habitats were described following habitat surveys in November 2022 (NBT, 2023e). The terrestrial and riparian habitat contained many invasive plants, mainly Himalayan blackberry (*Rubus ellipticus*) and scotch broom (*Cytisus scoparius*).

### 1.5.2 Marine Setting

The depth of the LCE ranges from approximately -8m to +5 m Chart Datum (CD), and is mostly comprised of cobble and sand (NBT, 2023e). In the LCE Offset Project footprint, the substrate is mostly sand, with the exception of the boulder augmentation placed in 2020 (Figure 1-2). The local salmon population in Lynn Creek is relatively small and includes chum, coho, chinook, and pink salmon. The LCE may be used for spawning migration.

In 2020, a boulder augmentation reef was created in the LCE, led by the North Shore Streamkeepers (NSSK) (Figure 1-2) between 0 m and + 1.2 m CD. The boulder reef was created to provide additional macroalgae habitat (i.e., fish habitat) for juvenile salmonids out-migrating through the LCE. Assessment of the boulder reef in 2021 and 2022 revealed that at least 22 invertebrate species and 10 algae species, including sugar kelp, have colonized the boulders (Seacology, 2021, 2022). The LCE Offset Project incorporates the existing boulder reef and has been designed to build on the work that has already been done by extending the rocky habitat beyond the current boulder reef boundary.

## 1.6 Document Scope

This document serves as the LCE CEMP for the construction of the LCE Offset Project and has the following objectives:

- Outline mitigation and monitoring measures to be implemented to minimize negative effects to the physical, biological, and socio-economic features associated with the LCE Offset Project.
- Identify commitments made during consultation and adherence to relevant Best Management Practices (BMPs).

The LCE CEMP was developed in alignment with the BMPs summarized in Section 6.1 and with the following guidance:

- DFO: Measures to Protect Fish and Fish Habitat (DFO, 2022).
- DFO: Fish and Fish Habitat Protection Policy Statement (DFO, 2019).
- Burrard Inlet Action Plan (KWL, 2017).
- Port Authority: ‘Project & Environmental Review – Guidelines – Construction Environmental Management Plan’ (Port Authority, 2021b).
- Tsleil-Waututh Nation (Tsleil-Waututh): ‘Construction Environmental Management Plan Requirements’ (Tsleil-Waututh, 2022).
- Tsleil-Waututh Nation Stewardship Policy (Tsleil-Waututh, 2019).

The LCE CEMP is an evolving document and will be updated as required based on changes to the proposed design, construction activities, acquisition of regulatory approvals, or as informed through consultation with Indigenous Groups and stakeholders. Permits and approvals for the LCE Offset Project, as they are received, will be provided in Appendix B.

### 1.7 Supporting Documents

Supporting documentation, in addition to this LCE CEMP, has been developed to support the regulatory approvals for the LCE Offset Project and is summarized in Table 1-1.

NBT has been and will continue to engage with Indigenous Groups through their respective project referrals process, which includes the Tsleil-Waututh, Squamish Nation (Squamish), and the Musqueam Indian Band (Musqueam). All LCE Offset Project related compliance documentation, including those developed by the Contractor, will be shared with interested Indigenous Groups.

**Table 1-1: List of Supporting Documents**

DOCUMENT TITLE	DESCRIPTION
Lynn Creek Estuary Fish and Fish Habitat Existing Conditions Report (NBT, 2023e)	The existing conditions report was developed to summarize the fish (including marine mammals) and fish habitat existing conditions within the LCE location. Study areas were defined for the LCE which is described in Section 1.1 of the report. Field programs were conducted to assess the subtidal, intertidal, and terrestrial habitats available.
Application for Authorization Supplemental Report (NBT, 2023b)	This document includes all the components required under the DFO Applicant’s Guide to Supporting the “Authorizations Concerning Fish and Fish Habitat Protection Regulations”. A table of concordance based on DFO-FFHPP criteria was developed and included within the document to support clear communication on application content.
Lynn Creek Estuary Offsetting Plan (NBT, 2023h)	This document summarizes the offsetting commitments and includes all the components required under the DFO Applicant’s Guide to Supporting the “Authorizations Concerning Fish and Fish Habitat Protection Regulations”. A table of concordance based on DFO-FFHPP criteria was developed and included within the document to support clear communication on application content.



DOCUMENT TITLE	DESCRIPTION
Lynn Creek Estuary Offsetting Basis of Design (NHC, 2023b)	The LCE Offsetting Basis of Design Report provides a design basis memo and preliminary engineering drawings. The Basis of Design Report outlines the technical basis of design supporting the habitat offset requirements outlined in the application. It includes environmental and engineering design criteria, operating conditions, user requirements, codes, safety, materials, and constructability. The design drawings provide the geodetic location of the structure, plans, sections and details of the proposed habitat offset, including elevation and areas of specific features, types and volumes of materials.
Lynn Creek Estuary Offset Hydraulic Assessment (NHC, 2023a)	Results of the hydraulic model Northwest Hydraulic Consultants is developing is presented in the Lynn Creek Estuary Preliminary Hydraulic Assessment Memorandum. The model will be used to inform potential for localized sedimentation in the vicinity of the LCE Offset Project, and will include wind-wave and tidal functions in Burrard Inlet, as well as freshwater inputs from Lynn Creek. The assessment will be part of the Detailed Design Report.
Lynn Creek Estuary Offset Project – Project and Environmental Review Permit Application Supporting Letter (NBT, 2023f)	This letter supports the Port Authority application and addresses the permit application’s information requirements which were provided through the respective PER checklists (Port Authority, 2023c).
Lynn Creek Estuary Offset Project – Request to Conduct Construction Outside of Vancouver Fraser Port Authority Standard Work Hours (NBT, 2023g)	This letter provides information required to support the LCE Offset Project’s request to conduct construction activity outside of Port Authority standard working hours. This letter was prepared in accordance with the Port Authority Project and Environmental Review Guideline – Construction Outside Regular Work Hours (Port Authority, 2023a).
Lynn Creek Estuary Archaeological CFMP (EcoLogic, 2023)	A project-specific Chance Find Procedure has been developed by EcoLogic Consultants Ltd. to outline procedures and response protocols to be followed in the event that archaeological or cultural materials are encountered during the LCE Offset Project. The CFMP will be developed in consideration of the guidelines available by Tsleil-Waututh Nation, Squamish Nation, and the Port Authority Archaeological Chance Find Procedure (Port Authority, 2021a).
Indigenous Consultation and Stakeholder Engagement Report (NBT, 2023d)	The Indigenous Consultation and Stakeholder Engagement report summarizes the consultation and engagement activities NBT has conducted with Indigenous Groups and pertinent Stakeholders for the B2 and LCE Offset Project.
Lynn Creek Estuary Contractor Construction	The Contractor will be responsible for the development of a CCEMP which will at a minimum meet the requirements stipulated in this LCE CEMP and the



DOCUMENT TITLE	DESCRIPTION
Environmental Management Plan (LCE CCEMP)	<p>commitments identified in any issued permits or approvals, including, but not limited to, the following:</p> <ul style="list-style-type: none"> <li>• Spill response and clean-up procedures in the form of a Spill and Emergency Response Plan.</li> <li>• Fuel management procedures.</li> <li>• Any site staging/access information.</li> </ul>
B2 and LCE Public Engagement Plan	<p>The B2 and LCE Public Engagement Plan outlines and documents NBT’s goals and commitments to conducting thorough public engagement for the B2 Project. The plan will outline the types of activities, opportunities, and materials developed to request feedback from the public on the B2 Project’s construction-related impacts, mitigations, and activities.</p> <p>The B2 Public Engagement Plan will be developed in accordance with the Port Authority’s PER Guidelines for Public Engagement (Port Authority, 2023b), and will include:</p> <ul style="list-style-type: none"> <li>• Overview of the B2 Project.</li> <li>• NBT’s goals and objectives for undertaking public engagement.</li> <li>• Description of the communities affected, including target audiences and possible impacts of the B2 Project during construction.</li> <li>• Planned public engagement opportunities, including opportunities to provide feedback through NBT’s website (neptuneterminals.com), email contact information, newspaper ads, distribution of a notice to invite community members located within 700 m of the Terminal.</li> </ul>

## 1.8 Roles and Responsibilities

### 1.8.1 Key Project Personnel

NBT will maintain an active key LCE Offset Project personnel list throughout the construction of the LCE Offset Project. Responsibilities are described in Table 1-2, and key Project contacts are provided in Appendix C, Table C-1. Project emergency contacts are provided in Appendix C, Table C-2.

**Table 1-2: Project Roles and Responsibilities**

ROLE	RESPONSIBILITY
<b>NBT</b>	
NBT Environmental Manager	Responsible for the overall environmental management of the LCE Offset Project.
	Provide the Contractor with a copy of the LCE CEMP.
	During construction, confirm compliance with the permits/approvals issued by Regulatory Authorities (RAs) (e.g., Port Authority, DFO-FFHPP), legislation (e.g.,

ROLE	RESPONSIBILITY
	<p>Regulations, Acts), contract documents, this CEMP, and guidelines and BMPs (Section 6.1).</p> <p>Retains the authority and the responsibility to issue stop works orders (see Section 6.7) to cease any construction activities that are deemed unsafe, environmentally unsound, or non-compliant.</p> <p>Confirm the lead Environmental Monitor (EM) who will be considered a Qualified Professional (QP). Consultants and/or Contractors undertaking the QP role will submit resumes and qualifications to the Director of Engineering and Projects (DEP). NBT can share associated documentation with RAs and interested Indigenous Groups.</p> <p>Confirm that any complaints received are communicated as indicated in the Project and Environmental Review (PER) approval and with the NBT Environmental Complaints Procedure (NBT, 2022).</p> <p>In advance of LCE Offset Project commencement, notifications to neighbours will follow the conditions stipulated in the respective PER approval.</p> <p>Confirm a plan is in place for the LCE Offset Project reporting commitments (see Section 6.5).</p> <p>Review and confirm that documents developed by the Contractor meet functionality and compliance with this LCE CEMP (see Section 1.7).</p> <p>Verify that Contractor personnel are updated on the environmental conditions, approvals, and regulatory requirements as required.</p> <p>Maintain and share up to date versions of this LCE CEMP and other applicable guidelines and BMPs (as described in Section 6.1).</p> <p>Report incidents and non-compliances as required. Alternatively, be responsible for confirming appropriate delegate(s) are overseeing this responsibility (e.g., Contractor, Environmental Inspector (EI)).</p>
<p>Director of People &amp; Community (DPC)</p>	<p>Responsible for communication with the public, Indigenous Groups, and stakeholders.</p> <p>Coordinate on-site visits by interested Indigenous Group to facilitate compliance monitoring when requested.</p> <p>Will confirm an appropriate plan is in place for communication and coordination with interested Indigenous Groups and the environmental monitoring team.</p>
<p>Environmental Inspector (EI) / Regulatory Lead</p>	<p>The NBT Environmental Manager will delegate responsibilities to the EI and/or Regulatory Lead as required.</p>



ROLE	RESPONSIBILITY
Project Manager	Reviews the construction schedule and communicate with the NBT Environmental Manager and DPC as required.
	The NT Environmental Manager will delegate responsibilities to the Project Manager as required.
	Confirm that details provided in Appendix C, Table C-1 are updated appropriately with future LCE CEMP revisions.
<b>Consultants</b>	
Archaeologist	Ecologic Consultants Ltd. (EcoLogic) will be retained as the professional archaeologist and their duties and responsibilities will be incorporated into a future revision of this LCE CEMP.
<b>Contractor</b>	
Project Manager	Provide NBT with a responsibilities matrix to assign roles and responsibilities outlined in this section.
	Verifying required permits, licenses, and approvals are in place prior to the start of the construction activities and complying with them throughout construction.
	Review the LCE CEMP with construction personnel and sub-contractors prior to commencing work.
	Develop Contractor related documents as required (see Section 1.7, Table 1-1).
	Developing project-specific Work Procedures that comply with the requirements of appropriate RAs and recognized BMPs in construction safety.
	Cooperate with the EM appointed for the work. Comply with written or verbal instructions with respect to conducting activities in compliance with the mitigation measures outlined in this LCE CEMP.
	Correct any deficiencies and any non-compliance issues upon direction from the EM, whether written or verbal. Corrections shall be made as soon as reasonably possible.
	Confirm that appropriate communication has occurred for non-compliances and accidental spills (see Section 6.5).
	Review of construction schedules and procedures for potential implications on construction personnel health and safety, site security and environmental effects.
	Appoint a spill coordinator who has knowledge of spill mitigation, containment, and reporting procedures to the NBT as per Section 6.3.2 and 6.5.2. Whether this role requires a dedicated position or can be assumed as a dual tasking (e.g., by the EM) will be a contractor decision with appropriate justification provided for the position.
Have an appropriate equipment inspection program in place to confirm that equipment brought to the LCE Offset Project site is in good working order. Equipment inspection records will be provided to NBT upon request.	



ROLE	RESPONSIBILITY
	Confirm an appropriate plan is in place for communication with the EM and the construction personnel which includes: <ul style="list-style-type: none"> <li>• Emergency response and communication.</li> <li>• General communication for all compliance aspects with the EM.</li> </ul>
<b>Lead EM (QP) – To be determined if this role reports to the Contractor or NBT</b>	
EM	Will be appropriately qualified to be considered as a QP with experience in marine construction monitoring.
	Develop the LCE CCEMP (see Section 1.7, Table 1-1) and confirm that appropriate compliance requirements are appropriately met throughout construction, and that construction personnel understand compliance requirements pertinent to their scope of work.
	Conduct a General Environmental Orientation, which should provide an overview of environmental sensitivities for the LCE Offset Project and an overview of environmental obligations, roles, and responsibilities.
	Provide leadership to the Contractor’s construction staff about the importance of meeting regulatory requirements and complying with industry and company BMPs and standards.
	Review, complete and submit an EM report to the NBT Environmental Manager.
	Confirm that all non-compliances or unanticipated environmental effects are reported to the NBT Environmental Manager immediately.
	Direct the NBT or Contractor’s PM to stop a construction activity if the activity is deemed to pose a risk to the environment (stop work described in Section 6.7).

## 2 REGULATORY FRAMEWORK

Legislation pertinent to the LCE Offset Project are described in this section, with guidelines and BMPs described in Section 6.1. As the LCE Offset Project is located on federal lands within Port Authority jurisdiction, environmental review and regulatory approvals are legislated under the *Canada Marine Act (CMA)* and the *Impact Assessment Act (IAA)*.

### 2.1 Permitting and Approvals

Applicable Project permits and compliance requirements are provided in Table 2-1.

**Table 2-1: Project Permitting and Approval Requirements**

LEGISLATION	REGULATORY AUTHORITY	FEDERAL, PROVINCIAL, MUNICIPAL	DESCRIPTION	CONSTRUCTION ACTIVITY	PERMIT/APPROVAL
<b>Permits and Approvals</b>					
CMA  IAA	Port Authority  Impact Assessment Agency of Canada (IAAC) [specific to IAA registry public posting]	Federal	The CMA establishes the Port Authority and assesses protection for the environment and safeguards the economic objectives of local, regional, and national governments. Permitting processes are required by owners or tenants conducting projects on Port Authority lands.  Project information will be posted to the IAA Registry for public review for the respective projects.	Construction at the LCE Offset Project site has the potential to impact Federal lands owned by the Port Authority.	The LCE Offset Project will be permitted as a component of the B2 Project, PER Permit (Category C) No. 21-068.
<i>Canadian Navigable Waters Act (CNWA), Collision Regulations</i>	TC	Federal	Regulation of works with the potential to obstruct or interfere with navigation through the Navigation Protection Program. The LCE Offset Project is located in scheduled waters under the CNWA, but the construction of the LCE Offset Project is not expected to interfere with navigation.	Marine construction with the potential to impact navigation.	No Interference with Navigation notification
<i>Fisheries Act</i>	DFO-FFHPP	Federal	Protection of fish and fish habitat under Section 34.4[1] and Section 35[1]. Section 34.4[1], prohibition against causing the death of fish, by means other than fishing. Section 35[1], prohibition against causing the harmful alteration, disruption, or destruction of fish habitat (HADD).	Marine construction with the potential to impact fish and fish habitat.	<i>Fisheries Act</i> Authorization (FAA). The LCE Offset Project will be permitted as part of the B2 Project FAA Application.
<b>Compliance Requirements</b>					
Aquatic Invasive Species Regulations (AISR)	DFO-FFHPP	Federal	Prevention of the spread or introduction of aquatic invasive species in BC.	Marine construction equipment has the potential to introduce aquatic invasive species.  There is no machinery or equipment being used for the LCE Offset Project that will be travelling from outside of BC.	No
Marine Mammal Regulations (MMR)	DFO-FFHPP	Federal	Prohibits the disturbance (e.g., feed, interact with, trap, tag) of marine mammals.	During in-water work, there is the potential to encounter marine mammals.	No
<i>BC Wildlife Act</i>	Ministry of Forests [BC]	Provincial	Defines wildlife including native and some non-native amphibians, reptiles, birds, and mammals, including the designation of wildlife species at risk (SAR) (e.g., endangered, threatened, or vulnerable status). Regulates the protection of wildlife from direct harm. Protects the majority of bird species and their nests.	No loss or alteration of vegetation or land-based habitat is anticipated.	No
SARA	DFO-FFHPP, ECCC	Federal	Sections 32, 33, and 58[1] govern the protection of threatened, endangered or species of special concern. Under <u>SARA, it is an offence to:</u> <ul style="list-style-type: none"> <li>• Kill, harm, or harass a listed species.</li> <li>• Damage or destroy a residence of a listed wildlife species.</li> <li>• Damage critical habitat of a listed species.</li> </ul>	During construction, there is low potential to encounter nesting at risk birds or other SAR. No impacts to SAR are expected as long as mitigation measures are followed. No critical habitat will be lost or altered.	No

LEGISLATION	REGULATORY AUTHORITY	FEDERAL, PROVINCIAL, MUNICIPAL	DESCRIPTION	CONSTRUCTION ACTIVITY	PERMIT/APPROVAL
<i>Fisheries Act (Section 36)</i>	ECCC	Federal	Pollution prevention provisions including the prohibition of depositing deleterious substances into waters frequented by fish.	Construction activities below the high water line (HWL) including placement of rocks for construction of a rock reef.	No
<i>Canada Shipping Act</i>	TC, DFO-FFHPP	Federal	Regulates pollution prevention and response measures in addition to various other shipping related items including vessel registration, safety, navigation services, and accidents.	Marine construction will involve the use of barges, tugboats, and work skiffs. The potential for accidental spills is managed through the LCE CCEMP (see Section 1.7).	No
Collision Regulations	TC	Federal	Governs safe passage, rights of way, crossing and overtaking, lights, shapes, sound signals and fog signals for vessels.	Marine construction will involve the use of barges, tugboats, and work skiffs.	No
<i>Canadian Environmental Protection Act, 1999 (CEPA)</i>	ECCC	Federal	Protects the environment, and the health and well-being of Canadians through pollution prevention and addresses potentially dangerous chemical substances.	Construction activities create the potential to release pollution and wastes into the environment through fueling, emissions, and potential spills. Management of deleterious substances and potential spills will be through the LCE CEMP and CCEMP (see Section 1.7).	No

### 3 CONSTRUCTION ACTIVITIES AND PROJECT SCHEDULE

Engineering design, construction activities, schedule, equipment, and site staging are discussed in this section. Engineering design for the LCE Offset Project has been supported by NHC. A list of relevant design drawings is provided in Appendix A of NHC (2023b):

- Sheet No. 001: Title Sheet and Notes.
- Sheet No. 002: Tenure Boundary Plan.
- Sheet No. 003: Plan and Profile (provided in Appendix A of this report).
- Sheet No. 004: Sections.
- Sheet No. 005: Typical Section and Detail.

#### 3.1 Engineering Design and Construction

The LCE Offset Project has a seabed footprint of approximately 1,710 m<sup>2</sup> (see Figure 1-2). The constructed rocky reef slopes and top surface are designed to withstand tidal current and orbital wave velocities and promote macroalgal growth for species-specific ideal growth elevation ranges (approximately -5.0 m to 1.0 m CD) (NHC, 2023b). The design of the rock reef will include larger rock placed as a berm in deeper waters to contain smaller material. The purpose of this placement is to add complexity and create a refuge for fish (NHC, 2023b). The elevation of the rock reef was a critical design element for optimal kelp growth. The elevation chosen is between -0.5 m to -3 m CD range.

Three rock types will be placed to form the rocky reef (NHC, 2023b):

- 545 m<sup>3</sup> of Type 1 (600mm diameter with a gradation from 300 mm to 900 mm or MoTI class 250kg).
- 335 m<sup>3</sup> of Type 2 (nominal diameter 200 mm with a gradation from 100 mm to 450 mm or MoTI class 10-25kg).

High-level construction activities for the LCE Offset Project include the following and are summarized in Table 3-1:

- Mobilization.
- Preparation of the rock reef location.
- Placement of rock as per engineering design.
- Demobilization.



**Table 3-1: Lynn Creek Estuary Offset Project Construction Summary**

ACTIVITY NO.	ACTIVITY	ACTIVITY DETAIL	CONSTRUCTION DETAIL	DRAWING NO.
1	Mobilization	Mobilization, use of, and demobilization of marine equipment.	The LCE Offset Project will be completed using marine-based equipment. It is expected that at a minimum, at least one barge-mounted crane and one materials scow for containing rock material will be required for completion of the construction activity (see Section 3.3).	NA
2	Preparation of rock reef location	The preparation of the rock reef location will be completed prior to placement of rocks.	The Contractor will be responsible for confirming the elevations, dimension, and stationing of the rock reef prior to placement of rock.	Sheet No: 003
3	Placement of rock	Placement of rocks will be completed a per engineering design: <ul style="list-style-type: none"> <li>• 390 m<sup>3</sup> of Type 1.</li> <li>• 470 m<sup>3</sup> of Type 2.</li> <li>• 100 units of Type 3.</li> </ul>	Rocks will be placed via a barge-mounted crane equipped with a clamshell bucket. Rocks will be lowered through the water column and placed as close to the seabed as possible; rocks will not be dumped or released from above the water surface.	Sheet No: 003, 004, 005
4	Demobilization	Upon completion of the LCE Offset Project, all equipment and materials will be demobilized from site.	The Contractor will be required to remove all equipment from the site upon completion of work.	NA



### 3.2 Schedule

Construction is expected to require two to three weeks and will occur between January and February of 2024, within DFO's recommended least risk window (Area 28, Vancouver – Burrard Inlet: August 16 – February 28) (DFO, 2014).

The LCE Offset Project will occur primarily within the Port Authority standard work hours (Monday to Saturday, 7:00 a.m. to 8:00 p.m., none on Sundays/holidays). However, authorization for construction activities outside of the Port Authority's standard work hours will be requested since the construction activities are tide dependent (see Section 3.3). A letter to request the out of construction hours approval has been developed to support the Port Authority approval (NBT, 2023g)<sup>1</sup>.

### 3.3 Site Access, Staging and Equipment

The LCE Offset Project construction is expected to be entirely marine based, with construction activities carried out using conventional marine construction methods and equipment from a floating barge. Marine equipment would include a barge-mounted crane for rock installation, materials barges, work skiffs/punts, and tugs to assist in barge movement. A draft Marine Construction Staging Plan will be developed to support Port Authority approvals. The Contractor will provide the final MCSP as a pre-construction requirement to confirm the staging and construction sequencing.

The construction schedule will be tidally dependent to allow for safe access by the marine equipment and to minimize negative effects to the marine environment (e.g., barge grounding). It is expected that a minimum working tide of 3.2 m will be required.

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<sup>1</sup> Prepared based on the guidance provided in the Port Authority document titled 'Project & Environmental Review – Guidelines – Construction Outside of Regular Work Hours' (Port Authority, 2023a).

## 4 POTENTIAL ENVIRONMENTAL EFFECTS

Construction activities as listed in Section 3.1 have the potential to impact the environment. Potential effects due to the LCE Offset Project are described in the following sections and are summarized in Table 4-1. Archaeological effects are described in Section 5.

**Table 4-1: Potential Effects of Offset Construction**

EFFECT	SECTION
Land-based effects	4.1
Marine water quality degradation	4.2
Physical damage to marine fauna (crushing, burial, or mortality)	4.3
Accidental invasive species introduction	4.4
Contaminated sediment and water	4.2
Construction noise	4.5
Air quality	4.6

### 4.1 Land-Based Effects

Project activities will occur primarily from water, and the import of the rocks will be marine-based on barges and/or other vessels. Importing fill materials by barge greatly reduces, if not eliminates, congestion and delays caused by trucking.

Vegetation is not present within the LCE Offset Project footprint, and vegetation removal is not anticipated as a required activity.

### 4.2 Marine Water Quality

Degradation of marine water quality has the potential to occur due to accidental spills and turbidity generated through seabed interactions (e.g., rock placement). However, effects are expected to be minimal, temporary, and localized to the immediate LCE Offset Project vicinity. The LCE Offset Project activities will occur within the DFO least risk fisheries window (Area 28: Vancouver, Burrard Inlet – August 16 – February 28). Monitoring measures will be in place to respond to concerns through monitoring for turbidity (see Section 6.4.3) and mitigations will be implemented (see Section 6.3.1, Table 6-1). The EM will implement a turbidity monitoring program to prevent exceedance of the Burrard Inlet Water Quality Objectives, BC Water Quality Guidelines (WQG) and Canadian Council of Ministers of the Environment (CCME) Canadian Environmental Quality Guidelines. A Contractor Spill Prevention and Emergency Response Plan (CSERP) will be included in the CCEMP and will be in place during all LCE Offset Project activities to minimize the likelihood of the release of a deleterious substance into the marine environment.

#### 4.3 Physical Damage to Marine Organisms

There is potential for crushing and burial of sessile or slow-moving marine invertebrates during LCE Offset Project activities, such as from the placement of the rock and from spuds dropping from the marine derrick. However, it is anticipated that there will be negligible effect on the ongoing productivity of the species in Burrard Inlet. It is expected that similar species assemblages from neighbouring habitats will recolonize the area post-construction, in addition to supporting additional species once the completion of the LCE Offset Project.

A marine salvage program will be undertaken prior to the commencement of the LCE Offset Project to remove mobile invertebrates (e.g. crabs, sea stars and urchins) from the seabed footprint (see Section 6.4.4).

#### 4.4 Accidental Invasive Species Introduction

In the absence of natural predators, invasive species (e.g., terrestrial and/or marine plants, animals, insects, etc.) can often out-compete native species, causing disruption and harm to existing ecosystems. Accidental introduction of invasive species can occur via the movement of construction equipment on- and off-site. Mitigation measures will be implemented to prevent the introduction and spread of invasive species (see Section 6.3.1, Table 6-1).

As vegetation is not present within the LCE Offset Project footprints, land-based invasive species are not anticipated to be encountered during the LCE Offset Project. However, *Sargassum muticum*, an invasive seaweed, has the potential to be present in the LCE Offset Project footprint. Small patches were observed nearby in the NBT B2 Project footprint in August 2022 (NBT, 2023c). However, Seacology did not observe this species during follow up monitoring of the pilot rock reef (Seacology, 2021, 2022). Mitigation measures to reduce the likelihood of the import/export of invasive species and the spread of *Sargassum muticum* from the Terminal are described in Section 6.3.1, Table 6-1.

#### 4.5 Construction Noise

It is expected that LCE Offset Project activities will generate minimal atmospheric noise impacts to the community.

Underwater noise and vibration are also likely to be minimal. There is no pile driving activity associated with the LCE Offset Project and project-generated underwater noise levels are expected to be below underwater noise thresholds for the protection of fish and marine mammals; as such, underwater noise monitoring is not required.

Equipment required for the LCE Offset Project is outlined in Section 3.3 and the Contractor will be expected to implement mitigations outlined in Section 6.3.1, Table 6-1 to minimize extraneous noise generated during the LCE Offset Project. Measures to address management of construction outside of the Port Authority standard working hours are described in Section 6.3.1, Table 6-1.

#### 4.6 Air Quality

Air quality management issues, including fugitive emissions, have the potential to occur due to vehicle and equipment operations, transport of materials, and other LCE Offset Project construction activities producing deleterious air emissions. Potential exposure pathways include emissions from machinery and equipment. Deleterious air emissions from the LCE



Offset Project will have minimal impact to the surrounding nearby receptors. Mitigation measures outlined in Section Section 6.3.1, Table 6-1 will be implemented by the Contractor to minimize negative impacts

## 5 ARCHAEOLOGICAL RESOURCES

An LCE Chance Find Management Plan (CFMP) will be developed for the LCE Offset Project by EcoLogic to confirm that appropriate measures are in place to manage archaeological procedures and response protocols during construction in the event that archaeological or cultural materials are encountered during construction activities. The LCE CFMP will be developed by EcoLogic and shared with RAs and interested Indigenous Groups once available.

## 6 ENVIRONMENTAL MANAGEMENT

### 6.1 Guidelines and Best Management Practices

Guidelines and BMPs that will be incorporated into operational procedure include:

- A Field Guide to Fuel Handling, Transportation and Storage (MWLAP, 2002).
- BC Approved Water Quality Guidelines (WQG) (BC ENV, 2021).
- Burrard Inlet Action Plan (KWL, 2017).
- Burrard Inlet Water Quality Objectives (WQO) (BC ENV, 2022).
- Canadian Environmental Quality Guidelines (CEQG) (CCME, 2022).
- DFO: Fish and fish habitat protection policy statement (DFO, 2019).
- DFO: Measures to protect fish and fish habitat (DFO, 2022).
- DFO: Projects near water: BC marine/estuarine timing windows for the protection of fish and fish habitat (DFO, 2014).
- Government of Canada's Archaeological Heritage Policy Framework (Parks Canada, 1990).
- NBT: Environmental Complaint Procedure (NBT, 2022).
- Parks Canada Guidelines for the Management of Archaeological Resources (Parks Canada, 2005).
- Squamish Nation Guidelines for Archaeological Chance Find Management 2020 (SFN, 2020).
- Tsleil-Waututh Nation Stewardship Policy (Tsleil-Waututh, 2019).
- Vancouver Fraser Port Authority – Archaeological Chance Find Procedure (Port Authority, 2021c).
- Vancouver Fraser Port Authority – Non-Road Diesel Emissions Program (Port Authority, 2020).
- Vancouver Fraser Port Authority – Project & Environmental Review Guidelines: Construction Environmental Management Plan (Port Authority, 2021b).

- Vancouver Fraser Port Authority – Project & Environmental Review Guidelines: Construction Outside of Regular Work Hours (Port Authority, 2023a).

## 6.2 Notifications, Engagement and Consultation

### 6.2.1 Regulatory Authorities

Notifications will be sent as required by RAs through permits and approvals. This CEMP will be updated to incorporate any additional requirements from the Port Authority and DFO-FFHPP, if necessary.

### 6.2.2 Indigenous Consultation

NBT supports early engagement with Indigenous Groups and has provided the opportunity to discuss the B2D2 Project with the Tsleil-Waututh, Squamish and Musqueam, and discussions are underway to confirm their support for the LCE Offset Project. The LCE Offset Project strategy will be to maintain an open dialogue with these Indigenous Groups throughout all stages of the LCE Offset Project planning and construction. Indigenous Groups who request it will be provided with all notifications and reports that are provided to RAs (e.g., incident reporting, weekly reports, and non-compliances). A record of Indigenous engagement is summarized in the Indigenous Consultation and Stakeholder Engagement Report (NBT, 2023d).

NBT will also support DFO-FFHPP and the Port Authority through their respective consultation processes as required.

### 6.2.3 Public Comment

The LCE Offset Project is being reviewed as part of the B2 Project Port Authority PER review (PER No. 21-068). As part of the PER process, a public commenting period will be undertaken for the B2 and LCE Offset Projects by the Port Authority and will include the 30-day posting on the IAA Registry. The public will have the opportunity to comment and provide community knowledge during this period.

### 6.2.4 Stakeholder

Several stakeholders have been engaged by NBT in advance of the Port Authority's engagement process either due to their interest in habitat restoration initiatives or due to their proximity to the LCE Offset Project. Communications with each stakeholder is underway and NBT have shared regulatory supporting documents for review in order to address any stakeholder questions or concerns. A list of stakeholders engaged is as follows:

- Vancouver Pile Driving Ltd. (VanPile).
- Lynnterm Terminals (Lynnterm).
- District of North Vancouver (DNV).
- North Shore Streamkeepers (NSSK).
- Council of Marine Carriers (CMC).

A summary of stakeholder engagement is provided in the Indigenous Consultation and Stakeholder Engagement Report (NBT, 2023d).

### 6.2.5 Public Engagement

As the LCE Offset Project is being reviewed as part of the B2 Project, community members will also have the opportunity to provide feedback on the LCE Offset Project as part of the B2 Project’s public engagement requirement. Public engagement for the B2 and LCE Offset Projects will be required to be undertaken by NBT for community members located within 700 m of the Terminal. Public engagement will occur over a period of 20 business days and the public engagement strategy will be detailed in the B2 and LCE Public Engagement Plan (NBT, 2023a) (see Table 1-1). A Public Engagement Summary and Consideration Report will be developed to summarize the feedback received and how it has been considered, in addition to identification of any proposed mitigations and commitments. This report will be posted on the NBT’s website (neptuneterminals.com) and provided to the Port Authority for posting.

## 6.3 Mitigation Measures and Procedures

Mitigation measures for the protection of the environment (including fish and fish habitat, water quality, air quality and noise) and procedures (spill and emergency response, fuel and waste management) to support the LCE Offset Project are outlined in Section 6.3.1, Table 6-1 and 6.3.2, Table 6-2.

### 6.3.1 Mitigation Measures

Mitigation measures for the proposed construction activities and their applicability to the LCE Offset Project are presented in Table 6-1. The EM will be responsible for confirming that appropriate measures are followed throughout all aspects of construction. Procedures for Emergency Response, Fuel Management and Waste Management are provided in Section 6.3.2, which will be supplemented by the Contractor developed LCE CCEMP (see Section 1.7, Table 1-1).

**Table 6-1: Mitigations**

NO.	DESCRIPTION
<b>General</b>	
G1	An EM will be on-site as described in Section 6.4.
G2	If injury or mortality to marine mammals or fish is observed, there is a Duty to Notify DFO immediately through the DFO-Pacific Observe, Record, and Report phone line (toll-free) at 1-866-845-6776. The Port Authority and interested Indigenous Groups will also be notified (Appendix C, Table C-2).
G3	All in-water work will cease if fish kill/injury to marine organisms or HADD of fish habitat is observed near the LCE Offset Project until the EM can provide guidance for the continuation of works. See Section 6.7 for stop-work procedures.



NO.	DESCRIPTION
G4	Stop-work procedures will be implemented if any non-compliance concerns arise that cannot be managed through adaptive management (see Section 6.6).
G5	The DPC or their delegate will engage with interested Indigenous Groups to confirm the opportunity to be present on-site is provided. Indigenous Groups will be requested to provide a point of contact to facilitate efficient communication. Advanced notice will be required to confirm appropriate safety training for on-site presence.
G6	The NBT Environmental Manager will confirm that documents developed by the Contractor are compliant with this CEMP (see Section 1.7 for document commitments).
G7	The EM will advise the LCE Offset Project team if construction activities have caused or are likely to cause an environmental incident and make recommendations for corrective action. Any changes to the compliance procedures will be documented through appropriate adaptive management communications (Section 6.6).
G9	The NBT Environmental Manager will be responsible for reporting incidents and non-compliances as required. Alternatively, the NBT Environmental Manager will be responsible for confirming appropriate delegate(s) are overseeing this responsibility (e.g., Contractor, EI).
G10	A Communication Plan will be implemented to confirm necessary communications between the Contractor(s), NBT (Environmental Manager, EI, DPC), environmental personnel and interested Indigenous Groups are appropriate.
G11	Complaints will be immediately forwarded to the NBT Environmental Manager, and notification and a response summary will be sent to the Port Authority within two days of the complaint.
G12	Personnel will be adequately trained and will use appropriate personal protective equipment.
G13	Copies of issued permits will be on-site and readily available.
G14	Work shall comply with requirements of applicable laws, legislation and BMPs (see Sections 2, 6.1), as well as compliance with recommendations or conditions outlined in pertinent RA approvals (e.g., Port Authority, DFO-FFHPP).
G15	Construction-related restrictions, conditions, or mitigation measures that are in the CEMP and part of RA approvals (the Port Authority, DFO-FFHPP) will be communicated to construction personnel by the EM (e.g., through pre-construction meetings; roles and responsibilities are described in Section 1.8).
G16	The construction schedule will be provided to interested Indigenous Groups and stakeholders in advance of construction.
G17	During vessel-related activities, the Contractor shall monitor the VHF channel in the respective area and execute the LCE Offset Project in a way that does not impede navigation or interfere with vessel operations. During the night, ensure marine vessels are moored outside the navigation channel and lit in accordance with applicable regulations.
G18	Inform the harbour master two days prior to work starting.



NO.	DESCRIPTION
<b>Fish and Fish Habitat</b>	
FFH1	In-water activities will not interfere with fish passage or result in the stranding or death of fish.
FFH2	The EM will establish a communication plan with the Contractor so that stop-work procedures can be effectively communicated should there be concerns during the LCE Offset Project.
FFH3	Any debris that enters the marine environment will be retrieved and disposed of at an approved facility.
FFH4	Barges or other vessels will not ground on the foreshore or seabed or otherwise disturb the foreshore or seabed (including disturbance as a result of vessel propeller wash).
FFH5	Rocks will be placed in a controlled manner so as to minimize turbidity resulting from the impact of the placed rock on the seabed
FFH6	Construction will be undertaken in compliance with the of the water quality guidelines outlined in Section 6.4.3, Table 6-3.
<b>Marine Mammals</b>	
MM1	Activities shall cease if there is risk of physical harm to a marine mammal from direct contact. Activities shall only resume once there is no longer risk of injury to marine mammals from direct contact.
MM2	Compliance with the MMR.
<b>Sensitive Habitat Features and SD</b>	
SHFS1	If any SAR is observed during construction, the EM will immediately be notified. The EM will document species, abundance, and behaviour, and provide notification to the Port Authority.
SHFS2	Stop-work procedures will be implemented if construction activities may cause harm to any identified SAR (see Section 6.7).
<b>Invasive Species Management</b>	
IS1	The Contractor shall verify that any rock brought to the LCE Offset Project is free of invasive species.
IS2	If the Contractor or EM observed <i>Sargassum muticum</i> during construction, the Contractor or EM will contain and remove the invasive seaweed for appropriate disposal.
<b>Water Quality (also see Section 6.4.3)</b>	
WQ1	The EM will confirm that no “in-water” construction activities result in exceedances of WQGs outside of the LCE Offset Project footprint. Turbidity monitoring will be carried out as described in Section 6.4.3.
WQ2	The Contractor shall not, directly, or indirectly; a) deposit or permit the deposit of a deleterious substance of any type into water frequented by fish in a manner contrary to Section 36(3) of the <i>Fisheries Act</i> ; or (b) adversely affect fish or fish habitat in a manner contrary to Section 35(1) of the <i>Fisheries Act</i> .
WQ3	Placed material should be free of fine sediments and shall be lowered through the water column and deposited near the seabed and not dumped or deposited from above or near the water surface.



NO.	DESCRIPTION
<b>Air Quality</b>	
AQ1	There will be no idling of vehicles and construction equipment when not in use. Idling is allowed for no more than 2 minutes in a 60-minute period when equipment is in use. Some exemptions to this can be referenced in the Port Authority Non-Road Diesel Emissions (NRDE) program (Port Authority, 2020) if reviewed and approved by NBT.
AQ2	Machinery, equipment, and stationary emission sources (e.g., diesel generators) will be well maintained in good working order and operated at optimal loads to minimize emissions.
AQ3	Stationary emission sources such as diesel generators will only be used as necessary and will be shut off when not in use.
AQ4	No burning of oils, rubber, tires, and any other material will take place.
AQ7	Material loads that could create dust will be covered as appropriate.
<b>Noise</b>	
N1	Conduct construction activities within the Port Authority's standard work hours (Monday to Saturday, 7:00 a.m. to 8:00 p.m., with no work permitted on Sundays or holidays) with the exception of approved/permitted construction activities outside of standard work hours (described in Section 3.2).
N2	A construction notice will be distributed a minimum of 10 days prior to construction or as outlined within conditions stipulated in the PER approval.
N3	Equipment will be properly maintained and fitted with exhaust and muffler systems.
N4	Engines will be turned off when not in use or reduced to idle.
N5	Where possible and safe to execute, barge and equipment is to be placed to obstruct the dominant sound path between the source and the receptor of noise during construction activities occurring outside of standard working hours. Should this not be sufficient, implementation of a noise barrier may be required.
N6	Lighting will be positioned away from residences, placed at low levels, and focused only on work areas, enabling the crews to perform work safely during construction activities outside of standard working hours.
N7	During construction activities outside of standard working hours, the expected crew size will be limited to only required personnel and is not expected to exceed the number of personnel present during daytime activities.
N8	Where possible and safe to do so, diesel engines will be shut off when not in use, electrically powered equipment will be preferentially used, back-up alarm volumes will be lowered when appropriate and used in combination with strobe lights, and use of high-noise power tools will be avoided.

NO.	DESCRIPTION
<b>Machinery and Equipment (see Section 6.3.2.2 for refuelling measures)</b>	
ME1	Equipment will be inspected prior to the commencement of construction to confirm it is in good operating condition, free of fluid leaks and invasive species.
ME2	Fuel-filled machinery will carry spill containment kits as described in Section 6.3.2.2.
ME3	Every piece of machinery and equipment brought to site must have a dedicated spill tray. The spill tray is to be put in place when the equipment is not in use or positioned in one location for work.
ME5	Regular equipment maintenance shall be performed as per manufacturer's requirements or as required to confirm all equipment is in good working order. The Contractor will be responsible for maintaining appropriate maintenance records and will be available upon request.
ME6	Construction lighting will reduce light-spill beyond the barge and placing task lighting close to the LCE Offset Project footprint.
ME7	Marine equipment operators will exhibit appropriate lights and day shapes, monitor VHF channels used for marine communications and traffic services, be familiar with vessel movements and not obstruct line of sight to navigational aids.
ME8	All NRDE used by the Contractor shall be reported by the Contractor as required under the NRDE Program (Port Authority, 2020) through the use of the Port Authority declaration form.
ME9	NRDE must be tier 3 or above and use low-sulphur diesel.
<b>Site Access, Mobilization and Laydown Areas</b>	
SAML1	While not working, marine equipment will be moored such that it does not obstruct charted Aids to Navigation and does not obstruct navigation.
SAML2	Marine equipment in operation must not prevent vessels from navigating past the LCE Offset Project site.
SAML3	Any false works, silt curtains, construction material or debris are to be completely removed from the waterway subsequent to construction completion.
SAML4	Navigational warning actions shall be taken by contacting the Canadian Coast Guard in advance of start date. Submissions can be made via email to NavWarn.MCTSPRinceRupert@innav.gc.ca or by phone at (250) 627-3070.

### 6.3.2 Procedures

Measures will be in place for emergency response, and for fuel and waste management. The mitigation measures outlined in Table 6-2 will be incorporated in the LCE CCEMP.

#### 6.3.2.1 Spill and Emergency Response

An emergency response plan allows for the rapid response of emergency services and/or containment and clean up of environmental emergencies. Emergency response and spill prevention measures outlined in Table 6-2 are to be included in the Contractor prepared CCEMP.

In the event of a release of deleterious substances (as defined by the BC Spill Report Regulations [SRR]) to water or to land that is over the volume of the listed BC SRR schedule, communication with RAs will be followed as described in Section 6.5.2. The Reportable Volumes for Spill to the Environment are provided in Appendix C, Table C-3. The LCE Offset Project and NBT emergency contact list is provided in Appendix C, Table C-2.

#### 6.3.2.2 Fuel Management

It is important to appropriately manage fuel storage, use, and refuelling activities during construction. The LCE CCEMP will describe fuel management strategies where commitments will be incorporated as described in Table 6-2.

#### 6.3.2.3 Waste Management

Waste generated from the LCE Offset Project has the potential to adversely affect the marine environment if not managed appropriately. The LCE CCEMP will describe their waste management strategies to reduce the risk of potential adverse effects. The mitigation measures outlined in Table 6-2 will be implemented and included in the LCE CCEMP.

**Table 6-2: Procedures**

CATEGORY	NO	DESCRIPTION
<b>Spill Emergency Response and Prevention</b>		
General	SERP 1	The Contractor will develop and adhere to a CCEMP including the Reportable Spill Volumes (Appendix C, Table C-3) and Spill Report Form (Appendix C, Table C-4).
Training and Responsibility	SERP 2	All construction personnel shall be trained in spill prevention and response, including the use of hazardous materials during site induction and subsequent toolbox talk sessions. All construction personnel will be familiar with the location and use of spill response equipment, including the deployment and use of spill booms.
	SERP 3	The spill coordinator will keep an inventory of hazardous materials required for the LCE Offset Project on site.
Spill Response Materials	SERP 4	Appropriate spill containment and clean-up supplies shall be available and kept at accessible locations during construction.
	SERP 5	Spill response materials are required to be readily available when working on the LCE Offset Project. These materials include, but are not limited to: <ul style="list-style-type: none"> <li>• Spill kits.</li> <li>• Containment booms.</li> <li>• Personal protective equipment (e.g., nitrile gloves, safety glasses, suits).</li> <li>• Fire extinguishers.</li> <li>• Shovels.</li> </ul>
	SERP 6	Spill kits will be inspected on a basis outlined within the LCE CCEMP and refilled immediately after use.





CATEGORY	NO	DESCRIPTION
	SERP 7	The LCE CCEMP will specify the contents of spill kits for marine-based activities.
Spill Response Procedures	SERP 8	The Contractor will utilize environmentally sensitive (e.g., biodegradable/food-grade/ environmentally friendly) oils, hydraulic fluids and lubricants that are non-toxic to marine life and that are readily biodegradable in equipment and machines unless the Contractor can demonstrate it is accepted by the Port Authority, or that it is not feasible because of: <ol style="list-style-type: none"> <li>1. Unavailability of biodegradable/food-grade/environmentally friendly oils and lubricants.</li> <li>2. Technical performance issues/constraints.</li> <li>3. Negative impacts on equipment.</li> <li>4. Other reasons deemed acceptable to the Port Authority.</li> </ol>
	SERP 9	The spill coordinator and Contractor will provide an immediate response to emergencies and incidents and notify the NBT Environmental Manager. The NBT Environmental Manager will notify appropriate RAs and will engage with the DPC for communication and with interested Indigenous Groups. All emergencies and incidents will be reported as described in Section 6.5.2.
	SERP 10	Initial response to the spill will at a minimum include the following: <ol style="list-style-type: none"> <li>1. Stop work.</li> <li>2. Maintain your own safety and the safety of others.</li> <li>3. Wear personal protective equipment, such as nitrile gloves and safety glasses.</li> <li>4. Identify the spilled materials and refer to the material data safety sheet to determine if human health or ignition hazards exist.</li> <li>5. If possible and safe to do so, contain the spill by any safe means possible (e.g., plug leak, close/isolate leaking valve).</li> <li>6. Obtain assistance of others.</li> <li>7. Begin containment of the spill and stop it from spreading.</li> <li>8. Clean up the spilled substance using available supplies from the on-site spill kits.</li> <li>9. If the spill is to water, use measures such as installing sorbent rolls as floating booms to contain the spill and sorbent pads to soak up the material.</li> <li>10. Report the spill as described in Section 6.5.2.</li> </ol>
	SERP 11	All reportable incidents will be documented and investigated by NBT to determine the cause. The incident reports will be prepared by the EM. Additional mitigation or updates to this LCE CCEMP will be implemented to prevent the recurrence of any similar event.
Reporting	SERP 12	Incident reporting procedures are described in Section 6.5.2.
<b>Fuel Management</b>		
Fuel Management	FM1	The Contractor will develop CCEMP (described in Section 1.7), which will include fuel management.
	SERP 3	The spill coordinator will keep an inventory of hazardous materials required for the LCE Offset Project on site.



CATEGORY	NO	DESCRIPTION
Training	FM2	Construction personnel responsible for refuelling of equipment and machinery will be familiar with the spill response training procedures and response measures described in Section 6.3.2.1 and the LCE CCEMP.
Fuel Handling Guide	FM3	Fuel handling, storage, and labelling procedures shall be consistent with A Field Guide to Fuel Handling, Transportation and Storage (the Field Guide) (MWLAP, 2002). If there are discrepancies between this LCE CEMP and the Field Guide, the Contractor will follow the more conservative, unless approved otherwise by the Port Authority.
	FM4	Spill trays shall be in place and a spill containment kit shall be immediately accessible in the event of an accidental spill.
	FM5	All fuel-carrying equipment will be accompanied with spill prevention, containment, and clean-up materials that are suitable for the volume of fuels carried.
	FM6	Fuel storage and refuelling facilities will be equipped with drip trays, or other secondary containment of 110% of the fuel stored.
	FM7	Portable fuel tanks (e.g., jerry cans) will be stored within leak-proof secondary containment with absorbent pads with a capacity of 110% of its volume.
	FM8	Fuel storage, including secondary containment, shall be kept free and clear of collected rainwater and snowfall. Accumulated water in the containment shall be removed regularly, to not diminish the capacity of the containment.
Fuelling	FM9	For the LCE Offset Project, fuelling and maintenance of equipment will be required to occur on (e.g., barge) or near the marine environment. Industry standard measures will be in place to minimize or prevent spills to the marine environment. If any fuelling occurs in or on the marine environment secondary containment shall be utilized.
	FM10	Fuel transfer lines will be equipped with check valves to prevent spillage in case of equipment failure.
	FM11	While refuelling, the operator will stay with the fuel nozzle. Vehicles and equipment will be shut off while refuelling.
	FM12	Refuelling shall be conducted on impermeable surfaces where possible.
<b>Waste Management</b>		
Waste Management	WM1	The Contractor must adhere to applicable legislation for handling, transporting, and disposing of waste material (including hazardous waste) in accordance with Provincial (BC EMA, Hazardous Waste Regulations (BC HWR), SRR) and Federal ( <i>Transportation of Dangerous Goods Act</i> ) legislation.
	WM2	Under no circumstances will waste materials be deliberately introduced into the marine or terrestrial environment, and any that does accidentally will be retrieved.
	WM3	Contractors shall separate and store waste materials and recyclable materials in appropriately labelled, covered, and secured containers on-site.



CATEGORY	NO	DESCRIPTION
	WM4	All waste will be collected and transported off-site for disposal and/or recycling at an approved facility by a barge or by truck according to applicable legislation, guidelines, and BMPs.
	WM5	All waste material will be removed in a timely matter to prevent the attraction of wildlife (e.g., birds).
	WM6	Used petroleum products, including their empty containers, will be collected by the Contractor, and transported to a licensed recycling facility in approved storage containers following applicable regulations.
Training	WM7	The Contractor will provide on-site staff with training in the use of hazardous materials and the location and use of spill kits and containment booms.
	WM8	Hydrocarbon products and other hazardous wastes potentially present during construction activities will be identified, stored, and handled in accordance with the associated Workplace Hazardous Materials Information System (WHMIS) and Safety Data Sheets (SDSs). SDSs will be kept on-site and made available to all construction team members. A list of hazardous materials can be provided to RAs or interested Indigenous Groups if requested.
	WM9	The Contractor will provide separate labelled containers for potentially hazardous waste such as oily rags and hydrocarbon absorbent pads. Liquid Hazardous waste will be contained in appropriate leak-proof labelled containers and stored in dedicated and secure storage areas with at least 110 % capacity for secondary containment.
	WM10	Sorbent materials or soils saturated with hydrocarbons (greater than or equal to 3% by weight) are classified as hazardous waste under the BC CMA and will be managed by the Contractor accordingly.
Portable toilets	WM11	Portable toilets staged on marine-based barges or near water (<30 m from Burrard Inlet) will be appropriately secured. Sewage from portable toilets will be disposed of in an approved sewage disposal facility on an as-needed basis.
Documentation	WM12	The Contractor shall maintain waste disposal manifests (e.g., for Hazardous Waste and/or transportation of dangerous goods manifests) and provide these to NBT or the EM upon request. Disposal records can be shared with pertinent RAs and interested Indigenous Groups upon request.
	WM13	The percentage of waste materials being reused or recycled will be tracked/documentated by the Contractor.

## 6.4 Monitoring Procedures

### 6.4.1 General

The general monitoring responsibilities of the EM are described in Section 1.8. Specific monitoring measures are described below:

- Monitor during in-water activities (e.g., placement of the boulders).

- Conduct regular monitoring (weekly at a minimum) with additional presence based on the sensitivity of the construction activities.
- Undertake monitoring during in-water construction activities as described in the following sections and during any other high-risk activities such as equipment encroachment near marine environments or those associated with emergency events.
- Visual monitoring of construction for potential risks to marine species.
- Monitor and adaptively manage work procedures.
- Routinely check to ensure equipment used for construction is in good working condition.
- Routinely check that the required emergency response materials (e.g., spill kits) are readily available on-site.
- Ensure construction personnel are aware of and trained in emergency response procedures and knowledgeable on the LCE CCEMP and in Section 6.3.2.

#### 6.4.2 Visual

Visual monitoring of construction will be ongoing for signs of stressors on marine species, fish kills, or any fish spawning/migration activity. All works will cease in the event of schooling herring, fish kill/injury, marine mammal or fish stress, or HADD to fish habitat, observed near the activity until the EM, the Port Authority, or DFO-FFHPP can provide guidance for the continuation of work.

#### 6.4.3 Turbidity

During in-water construction activities, turbidity monitoring will be conducted based on the Burrard Inlet WQO, provincial (Ministry of Environmental and Climate Change Strategy (BC ENV)), and federal (CCME) WQG for turbidity (see Table 6-3).

Turbidity monitoring will be undertaken if there are visual concerns for turbidity and as requested by RAs or through Indigenous consultation. The EM will confirm an appropriate compliance monitoring zone in the CCEMP (e.g., 30 m from the source). If visual observations of turbidity extend beyond this zone, compliance monitoring will be undertaken. Turbidity compliance is relative to a background measurement, and therefore the EM will select an appropriate reference/background sample location that is not affected by the construction activities. Reference samples will be collected within one hour and on the same tidal cycle as the compliance sample.

**Table 6-3: Turbidity Guideline and Criteria**

GUIDELINE	CRITERIA
ENV approved WQG	<p>During clear flows: change from background of 8 NTU at any one time for a duration of 24 hours or change from background of 2 NTU at any one time for a duration of 30 days.</p> <p>When background is between 8 and 50 NTU, during high flows or in turbid waters: change from background of 5 NTU at any time.</p> <p>When background is greater than 50 NTU, during high flows or turbid waters: change from background of 10%.</p>
Burrard Inlet WQO	5 NTU maximum increase over background.
CCME	<p>For clear flow water: maximum increase of 8 NTUs from background levels for short-term exposure (e.g., 24-h period). Maximum average increase of 2 NTUs from background levels for a longer-term exposure (e.g., 30-day period).</p> <p>For high flow or turbid waters: maximum increase of 8 NTUs from background levels at any one time when background levels are between 8 and 80 NTUs. Shall not increase more than 10% of background levels when the background is &gt; 80 NTUs.</p>

Source: BC ENV (2021, 2022); CCME (1999)

#### 6.4.4 Salvage

A marine salvage program will be undertaken within five days of the start of the LCE Offset Project. The objective of the salvage program will be to hand capture marine epifaunal invertebrates (e.g., crabs, sea stars, sea urchins, sea cucumbers) from the seabed footprint. Specific methodologies to be undertaken will be developed through discussions with DFO-FFHPP and interested Indigenous Groups. Appropriate approvals (e.g., DFO License to Fish for Scientific Purposes) will be in place before the salvage program. All salvaged animals will be retained in aerated coolers filled with seawater collected from the salvage area, kept out of direct sunlight, and immediately relocated (within 1-2 hours of capture) to a location 100-500 m away, to an area with same depth and substrate type.

### 6.5 Reporting

The EM will prepare an end of construction monitoring report. The monitoring report will be available for submission if requested to the Port Authority, DFO-FFHPP, interested Indigenous Groups, and other RAs.

#### 6.5.1 General

The end of construction summary will, at a minimum, contain:

- Description of activities and identification of construction activities that are: within the water lot (below HWL [in, out-of-water], above the HWL, over water) and on land.

- Photographs of construction and status of LCE Offset Project work activities (e.g., percent complete).
- Name(s) of EM on-site.
- Date.
- Weather conditions and visibility.
- Equipment used and its condition.
- An organized checklist or table of key mitigation requirements of the LCE CEMP, including those of the Port Authority and DFO-FFHPP, to verify implementation and effectiveness.
- Environmental meeting notes and key issues discussed.
- Design updates and construction activities for that period.
- Summary of environmental issues (e.g., spill, underwater threshold and turbidity exceedances, non-compliance with the CEMP) and mitigation measures, including corrective actions, implemented in response to these issues during the reporting period.
- Sampling data (e.g., turbidity).
- An overview of fish and wildlife observations, and potential negative interactions with construction activities.
- A summary of the marine mammal species observed.

#### 6.5.2 Incident Reporting

Environmental incident reporting is the responsibility of the Contractor with support of the EM. Reporting shall be carried out for incidents that pose or may pose a threat to the environment, such as spills, encroachment into sensitive areas, or disruption or destruction of fish or fish habitat.

Spill and emergency response procedures are described in Section 6.3.2, Table 6-2. In the event of an emergency that is reportable under the CEPA, 1999 and through the SRR, the Contractor will adhere to the incident reporting requirements outlined in the following sections.

Pertinent RAs and interested Indigenous Groups will be notified of reportable incidents within 24 hours. A reportable incident is defined as an incident resulting in:

- A potential/actual contravention of legislation. According to Section 64 of CEPA, 1999, substances are considered harmful if they are entering or could enter the environment in quantities or concentrations or under conditions that:
  - Have or may have an immediate or long-term harmful effect on the environment or its biological diversity.
  - Constitute or may constitute a danger to the environment on which life depends.

- Constitute or may constitute a danger to human life or health in Canada.
- Contravention of a permit/approval condition.
- As defined in the BC SRR.
- A significant non-compliance with the LCE CEMP resulting in environmental effect, including injury or mortality to fish and marine mammals.

## 6.6 Adaptive Management

During the LCE Offset Project, it may be necessary to modify methodology and address conditions not initially foreseen. Should adaptive measures be required, the EM, in conjunction with the Contractor, interested Indigenous Groups and NBT, will develop an update to the methodology. The EM will then evaluate any additional potential environmental effects or regulatory requirements. Mitigation and/or monitoring measures will be updated.

## 6.7 Stop Work Procedures

The EM will have the authority to implement stop work procedures where activities are adversely affecting, or will adversely affect, the environment or archaeological resources. The EM will also make recommendations in the field for avoiding and mitigating effects.

Indigenous Groups representatives can discuss any concerns with the EM, and the archaeologist will work collaboratively with the Indigenous Group's representative to ensure the protection of archaeological and heritage sites.



## 7 CONTRIBUTIONS

Regulatory professionals from Hatfield and NBT (through Dynamic Ocean) have contributed to the development of this CEMP.

ORGANIZATION	NAME
Hatfield	Stewart Wright, MSc.
	Becca Kordas, PhD. RPBio
	Francine Beaujot, MSc. RPBio
NBT	Victoria Burdett-Coutts, MSc. RPBio
Dynamic Ocean	Laura Borden, MSc. RPBio
	Carmen Wu, BSc. BIT

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vburdett-coutts@neptuneterminals.com



## 8 REFERENCES

- BC ENV. (2021). Approved Water Quality Guidelines: Aquatic Life, Wildlife & Agriculture - Guideline Summary. Water Quality Guidelines Series, WQG-20. Available at: [https://www2.gov.bc.ca/assets/gov/environment/air-land-water/water/waterquality/water-quality-guidelines/approved-wqgs/wqg\\_summary\\_aquaticlife\\_wildlife\\_agri.pdf](https://www2.gov.bc.ca/assets/gov/environment/air-land-water/water/waterquality/water-quality-guidelines/approved-wqgs/wqg_summary_aquaticlife_wildlife_agri.pdf). Accessed: June 2023.
- BC ENV. (2022). Burrard Inlet Water Quality Objectives. Available at: <https://www2.gov.bc.ca/gov/content/environment/air-land-water/water/water-quality/water-quality-objectives/south-coast-region-water-quality-objectives/burrard-inlet-water-quality-objectives> Accessed: June 2023.
- CCME. (1999). Canadian Council of Ministers of the Environment. Turbidity CCME Summary Table: Turbidity factsheet. Available at: <http://stts.ccme.ca/en/index.html?lang=en&factsheet=219>. Accessed: January 2023.
- CCME. (2022). Canadian Environmental Quality Guidelines (CEQGs). Available at: <https://ccme.ca/en/current-activities/canadian-environmental-quality-guidelines> Accessed: January 2023.
- DFO. (2014). British Columbia Marine/Estuarine Timing Windows for the Protection of Fish and Fish Habitat - South Coast and Lower Fraser Areas Available at: <https://www.dfo-mpo.gc.ca/pnw-ppe/timing-periodes/bc-s-eng.html#area-28> Accessed: July 2023.
- DFO. (2019). Fish and Fish Habitat Protection Policy Statement. August 2019. Available at: <https://www.dfo-mpo.gc.ca/pnw-ppe/policy-politique-eng.html>. Accessed: March 2023.
- DFO. (2022). Measures to Protect Fish and Fish Habitat. Available at: <https://www.dfo-mpo.gc.ca/pnw-ppe/measures-mesures-eng.html>. Accessed: March 2023.
- EcoLogic. (2023). Lynn Creek Estuary Offset Project Archaeological Chance Find Management Plan. Prepared for: Neptune Bulk Terminals (Canada) Ltd. April 24, 2023. Rev0.
- KWL. (2017). Burrard Inlet Action Plan: A science-based, First Nations-led initiative to improve the health of the Burrard Inlet ecosystem by 2025. Prepared for: Tsleil-Waututh Nation. October, 2017.
- MWLAP. (2002). A Field Guide to Fuel Handling, Transportation and Storage. 3rd Edition. February 2002. Available at: [https://www2.gov.bc.ca/assets/gov/environment/waste-management/industrialwaste/industrial-waste/oilandgas/fuel\\_handle\\_guide.pdf](https://www2.gov.bc.ca/assets/gov/environment/waste-management/industrialwaste/industrial-waste/oilandgas/fuel_handle_guide.pdf) Accessed: February 2022.
- NBT. (2022). Environmental Complaint Procedure. Doc No: PRO-NBT-191029. January 21, 2022. Rev. 2.
- NBT. (2023a). Berth 2 and Lynn Creek Estuary Offset Project Public Engagement Plan. Doc No: PLAN-B2D2-0011. April 24, 2023. Rev2.
- NBT. (2023b). Berth 2 Shiploader Replacement Project Application for Authorization Supplemental Report. Doc No: REP-B2D2-0001. July 14, 2023. Rev3.
- NBT. (2023c). Berth 2 Shiploader Replacement Project. Marine Fish and Fish Habitat Existing Conditions Report. Doc No: REP-B2D2-0004. July 14, 2023. Rev4.



- NBT. (2023d). Indigenous Consultation and Stakeholder Engagement Report. Doc No: REP-NBT-0006. July 14, 2023. Rev1.
- NBT. (2023e). Lynn Creek Estuary Fish and Fish Habitat Existing Conditions Report. B2D2 Project. Doc No: REP-B2D2-0002. July 14, 2023. Rev2.
- NBT. (2023f). Lynn Creek Estuary Offset Project – Category C - Vancouver Fraser Port Authority – Project and Environmental Review Permit Application (PER 21-068). Doc No: LET-VFPA-0007. July 14, 2023. Rev3.
- NBT. (2023g). Lynn Creek Estuary Offset Project – Request to Conduct Construction Outside of Vancouver Fraser Port Authority Standard Work Hours (PER 21-068). Doc No: LET-VFPA-0006. July 14, 2023. Rev3.
- NBT. (2023h). Lynn Creek Estuary Offsetting Plan. B2D2 Project. Doc No: PLAN-B2D2-0008. July 14, 2023. Rev3.
- NHC. (2023a). Lynn Creek Estuary Offset Sedimentation Assessment. Doc No: LET-NHC-LCE Sedimentation Modelling. June 12, 2023. Rev3.
- NHC. (2023b). Lynn Creek Estuary Offsetting Basis of Design Report. July 14, 2023. Rev3.
- Parks Canada. (1990). Archaeological Heritage Policy Framework - 1990. Available at: <https://www.pc.gc.ca/en/docs/pc/poli/arch> Accessed: March 2022.
- Parks Canada. (2005). Guidelines for the Management of Archaeological Resources: Available at: <https://www.pc.gc.ca/en/docs/pc/guide/gra-mar/index> Accessed: March 2022.
- Port Authority. (2020). Non-Road Diesel Emissions Program. Available at: <https://www.portvancouver.com/environmental-protection-at-the-port-of-vancouver/climate-action-at-the-port-of-vancouver/nrde/>. Accessed: January 2022.
- Port Authority. (2021a). Archaeological Chance Find Procedure. July 19, 2021. Available at: <https://www.portvancouver.com/wp-content/uploads/2021/09/2021-07-19-Vancouver-Fraser-Port-Authority-Archaeological-Chance-Find-Procedure-1.pdf>. Accessed: March 2023.
- Port Authority. (2021b). Project & Environmental Review Guidelines - Construction Environmental Management Plan (CEMP). September 2021. Available at: <https://www.portvancouver.com/wp-content/uploads/2021/09/2021-09-16-CEMP-Guidelines-Update.pdf>. Accessed: January 2023.
- Port Authority. (2021c). Project and Environmental Review Guidelines - Demolition. January 31, 2022. Available at: <https://www.portvancouver.com/wp-content/uploads/2022/02/2022-02-03-PER-Guideline-Demolition.pdf>. Accessed: November 2022.
- Port Authority. (2023a). Project and Environmental Review Guideline - Construction Outside of Regular Work Hours. March 2023. Available at: <https://www.portvancouver.com/wp-content/uploads/2023/03/2023-03-09-PER-Guideline-Construction-Outside-Regular-Work-Hours.pdf>. Accessed: March 2023.
- Port Authority. (2023b). Project and Environmental Review Guidelines - Public engagement. January 2023. Available at: <https://www.portvancouver.com/wp-content/uploads/2023/01/2023-01-20-PER-guidelines-public-engagement.pdf>. Accessed: February 2023.



Port Authority. (2023c). RE: Lynn Creek Estuary Project Description - PER 21 068. Email correspondence from Port Authority (T. Mitchell) to NBT (V. Burdett-Coutts) on February 23, 2023.

Seacology. (2021). Lynn Creek Estuary Boulder Habitat Inspection, Summer 2021. NW Seacology Environmental Consultants.

Seacology. (2022). Lynn Creek Estuary Boulder Habitat Augmentation Inspection, Summer 2022. NW Seacology Environmental Consultants.

SFN. (2020). Guidelines for Archaeological Chance Find Management. Revised: January 13, 2021.

Spill Reporting Regulations. B.C. Spill Reporting Regulations. B.C. Reg. 187/2017. Enabling Act: BC Environmental Management Act. Last amended: December 5, 2017 by B.C. Reg. 221/2017. Available at: [https://www.bclaws.gov.bc.ca/civix/document/id/complete/statreg/187\\_2017](https://www.bclaws.gov.bc.ca/civix/document/id/complete/statreg/187_2017).

Tsleil-Waututh. (2019). Subject: Treaty Negotiations - Proposed Stewardship Policy from the Tsleil-Waututh Nation.

Tsleil-Waututh. (2022). Tsleil-Waututh Nation. Construction Environmental Management Plan Requirements. January 2022.



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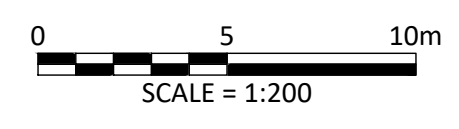
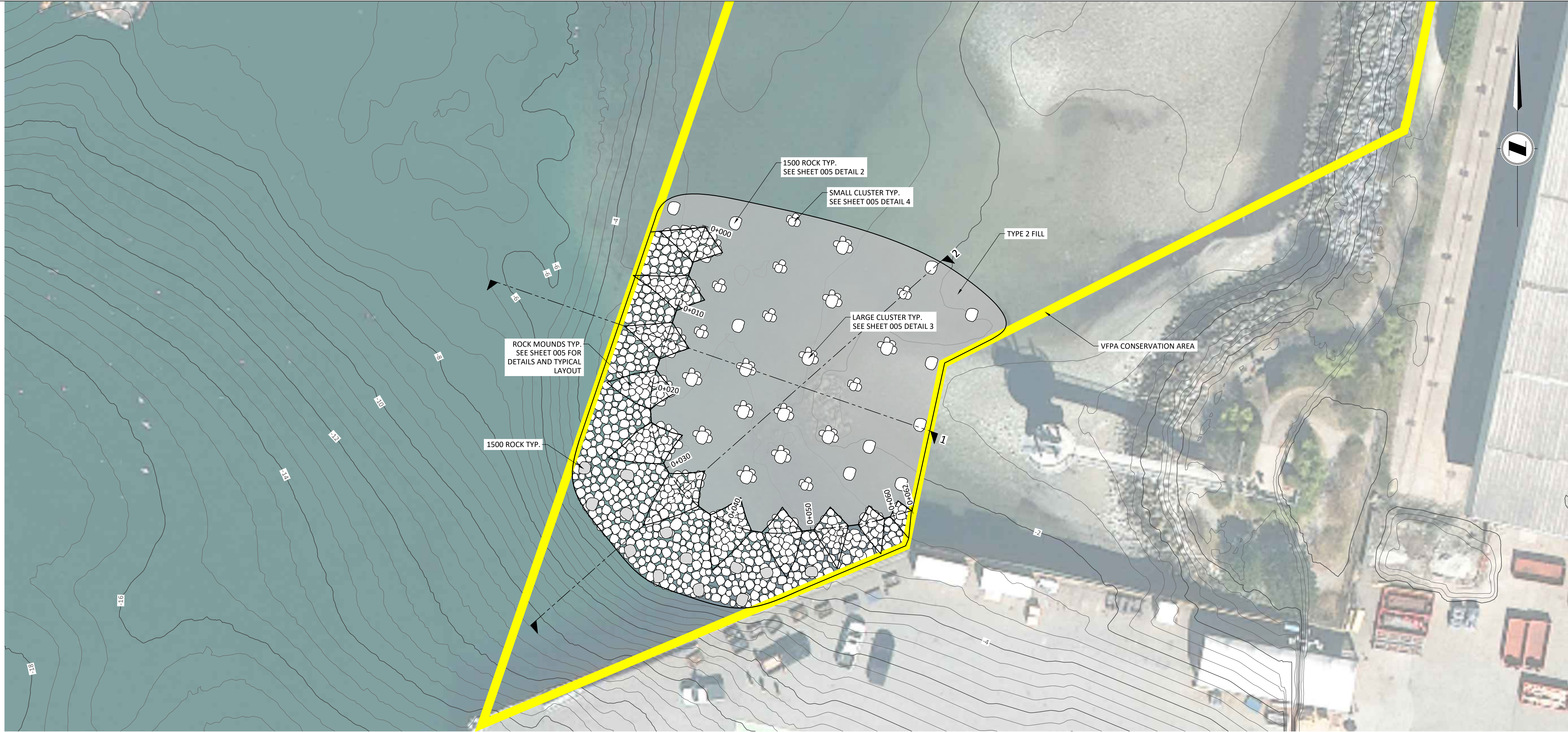
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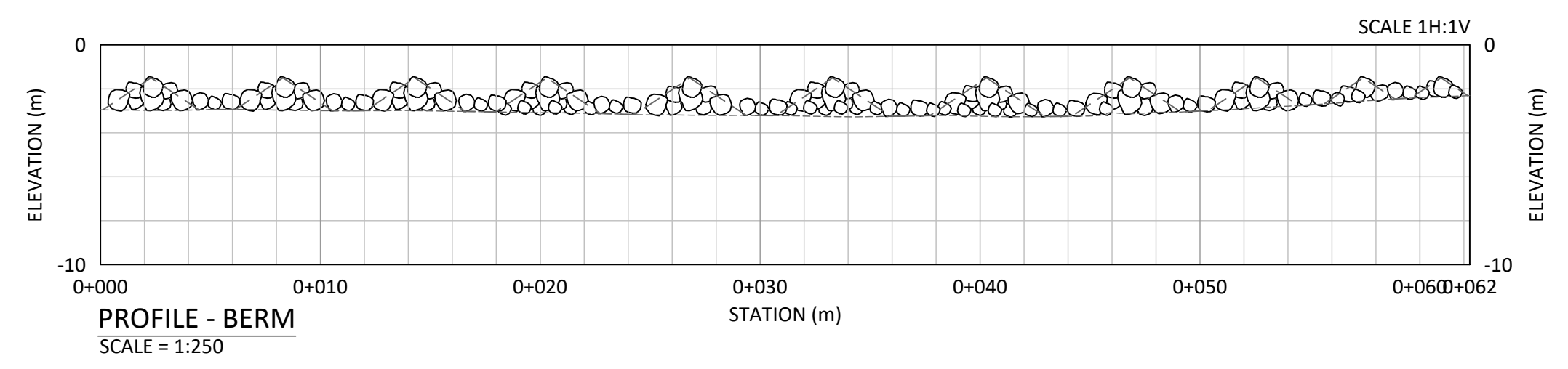
## APPENDIX A – CONCEPTUAL DESIGN DRAWING

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PLAN VIEW  
1:250



CLIENT:  
**NEPTUNE TERMINALS**  
 SUITE 100 - 340 BROOKSBANK AVE  
 NORTH VANCOUVER, BC  
 V7J 2C1

REV.	DATE	DESCRIPTION
0	13 01 2023	ISSUED FOR PERMITTING



SEAL:

LOWER LYNN CREEK HABITAT OFFSETTING ROCKY REEF CONCEPTUAL DESIGN		
PLAN AND PROFILE		
DESIGNED: GMG	SHEET ID: 3007864-2332-IFP-NEPTUNE LOWER LYNN-R1F-003 R0	SHEET No: 003
DRAFTED: CZZ	STATUS: ISSUED FOR PERMITTING	
CHECKED: BMC	SCALE: AS SHOWN WHEN PLOTTED D SIZE	
APPROVED: ----	DATE: 13 JUL 2023	REV No: R0

Drawing A-1

SUPERSEDES ALL REVISIONS WITH NUMBER PRECEDING



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## APPENDIX B – PROJECT PERMITS AND APPROVALS

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**Vancouver Fraser Port Authority, Category C, PER 21-068**

(to come)



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**Fisheries and Oceans Canada – Fish and Fish Habitat Protection Program (DFO-FFHPP) – *Fisheries Act* Authorization**

(to come)





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Doc Ref #:  
Doc Rev #:

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## APPENDIX C – SUPPORTING TABLES

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**Table C-1: Key Project Personnel**

TITLE	NAME	PHONE	EMAIL
<b>Neptune Bulk Terminals</b>			
Vice President of Health, Safety and Environment	Brad Walker	778-888-9190	<a href="mailto:bwalker@neptuneterminals.com">bwalker@neptuneterminals.com</a>
Director of Community & Stakeholder Engagement	Lisa Dooling	604-968-4804	<a href="mailto:ldooling@neptuneterminals.com">ldooling@neptuneterminals.com</a>
Project Manager	Nelly Francois	604-838-3677	<a href="mailto:nfrancois@neptuneterminals.com">nfrancois@neptuneterminals.com</a>
Environmental Inspector/Regulatory Lead	Victoria Burdett-Coutts	778-839-2372	<a href="mailto:vburdett-coutts@neptuneterminals.com">vburdett-coutts@neptuneterminals.com</a>
<b>Regulatory Authorities</b>			
Port Authority	Taisha Mitchell	236-558-6785	<a href="mailto:Taisha.Mitchell@portvancouver.com">Taisha.Mitchell@portvancouver.com</a>
DFO-FFHPP (RFR)	Rebecca Barrick	236-330-3053	<a href="mailto:Rebecca.Barrick@dfo-mpo.gc.ca">Rebecca.Barrick@dfo-mpo.gc.ca</a>
DFO-FFHPP (FAA)	Sara Jossul	236-334-3806	<a href="mailto:Sara.Jossul@dfo-mpo.gc.ca">Sara.Jossul@dfo-mpo.gc.ca</a>
<b>Contractor(s)</b>			
To be updated subsequent to contract award (e.g., Contractor Project Manager)			
<b>Environmental Consultants</b>			
Hatfield	Stewart Wright	604-375-9118	<a href="mailto:swright@hatfieldgroup.com">swright@hatfieldgroup.com</a>
	Becca Kordas	604-926-3261	<a href="mailto:rkordas@hatfieldgroup.com">rkordas@hatfieldgroup.com</a>
<b>Professional Archaeologist</b>			
Senior Archaeologist	Greg Morrissey	604-537-5615	<a href="mailto:gmorrissey@ecologicconsultants.com">gmorrissey@ecologicconsultants.com</a>
<b>QP – Environmental Team</b>			
Lead EM	To be provided once confirmed		
Primary On-site EM			
<b>Engineering Team</b>			
Design Engineer – NHC	Barry Chillibeck	604-790-6780	<a href="mailto:bchillibeck@nhcweb.com">bchillibeck@nhcweb.com</a>

**Table C-2: Project Emergency Contacts**

EMERGENCY	NAME	NUMBER
Facility	Fire, Ambulance, Police	911
	Neptune Site Security	604-985-7461 Local 250
	Neptune Site First Aid Attendant	Site Radio Channel #2 or Local 222
For observations of injured, stranded, entangled, or dead marine mammal or sea turtle	BC Marine Mammal Response Network (Observe, Record, Report)	1-800-465-4336 <a href="mailto:DFO.ORR-ONS.MPO@dfo-mpo.gc.ca">DFO.ORR-ONS.MPO@dfo-mpo.gc.ca</a> VHF Channel 16
If injury or mortality to marine mammals or fish is observed, there is a Duty to Notify DFO immediately	DFO-Pacific Observe, Record, and Report phone line (toll-free)	1-800-465-4366 1-866-845-6776.
	Port Authority	PER@portvancouver.com
Archaeological chance find	Port Authority	PER hotline at 604.665.9047 PER Team at PER@portvancouver.com
	BC Archaeological Branch	1-250-953-3334
Spill Reporting for all regulatory reportable spills to land and water	Emergency Management BC (EMBC) and Environment Canada	1-800-663-3456
Search and rescue incident	Canadian Coast Guard	250-413-8933 1-800-567-5111 (Toll Free) VHF Channel 16
Additional Spill Response /Reporting Contacts	Canadian Coast Guard (For an oil spill into water)	1-800-889-8852
	Land Response – CEDA Reactor Ltd	604-540-4100 (Emergency) 604-540-4100 (Non-Emergency)
	Land Response – McRae’s Septic Tank Service	604-856-8344 (Emergency) 1-888-894-4411 (Toll Free)
	Marine Response - WCMRC	604-294-9116 (Emergency) 604-293-2384 (Non-Emergency)
	Vancouver Pile Driving	604-986-5911 (Emergency) 604-986-5911 (Non-Emergency)



EMERGENCY	NAME	NUMBER
Death of fish (Non-Emergency Contact)	DFO Fish and Fish Habitat Protection Program	1-866-845-6776 <a href="mailto:ReferralsPacific@dfo-mpo.gc.ca">ReferralsPacific@dfo-mpo.gc.ca</a>
Port Emergencies (security threats, access issues), and marine vessels	Port Metro Vancouver (24/7 Operations Centre / Harbour Master Office)	604-665-9086
For water and sewerage emergency only	PAH (Greater Vancouver Regional District)	604-444-8401
For unauthorized air discharges and discharges to sewer		604-436-6777 (07:30 to 23:30 hrs) 604-643-8488 (23:30 to 07:30 hrs)
For Health & Safety Emergencies	WorkSafe BC Prevention Emergency Line	604-276-3301 1-888-621-7233 (Toll Free)
For Health & Safety Emergencies	Human Resources and Skills Development Canada (HRSDC)	1-800-641-4049
Additional notification	I.L.W.U. Local 500	604-254-7131
	I.L.W.U. Local 514	604-298-9684
	CN Rail Lynn Creek Yardmaster	604-903-7133
	Cargill Grain Terminal Security	604-990-2554
	BC Hydro Emergency Line	1-888-769-3766
	Fortis BC	1-800-663-9911
	City of North Vancouver – Sewer and Water Emergency	604-987-7155 (Daytime) 604-988-2212 (After Hours)

**Table C-3: Reportable Volumes for Spills to the Environment**

FLUID	ACTIVE INGREDIENT	PACKAGING	SPILL THRESHOLD <sup>2</sup>	POSSIBLE LOCATIONS
Deleterious Substance <sup>3</sup>	Any	None	Any amount	Burrard Inlet
Listed substance <sup>4</sup>	Any	Various	Any amount	Burrard Inlet
Antifreeze	90-99% ethanediol (ethylene glycol)	205 Litre Drum	5 L Note 4	Heavy Duty Shop
R-134A, R-22, R- 410 A	Refrigerant	Unit reservoirs	10 kg	HVAC Units
Gasoline or Diesel Fuel (Class 3)	Fuel	Tanks	100 L	Mobile Equipment
Varsol (Class 3)	70-100% Mineral Spirits	205 Litre Drum	100 L	Lube Shed
Waste Oil	Oil	5000 Litre Drum	100 L	Lube Shed Tank
New Oil (e.g., Automatic Transmission Fluid, XD3 OW – 40 Oil, Essa Trans 30 Oil, Univis Bio 40 Oil, Mobilgear SGC – 150 Oil)	Oil	205 Litre Drum to 2400 Litre Totes	100 L	Lube Shed
Fluid Film Liquid A	Oil	205 Litre Drum	100 L	Oil Storage Facility (OSF)
Soil-Cement	Acrylic and Vinyl Acetate polymer	1000 Litre Tote	200 L	Near Gas Fueling Station
Aerosol Paint (Class 2.1)	Light Hydrocarbons	12 to 16 oz cans	10 kgs	Stores

<sup>2</sup> The listed reportable volumes do not apply to spills within the confines of the CWTS or DBWTS catchment area, nor inside any storage sheds or buildings, unless there is a risk of the spill reaching the environment, i.e., via storm drains. Limits are based on the definition of deleterious substance in the *Fisheries Act*, the *Transportation of Dangerous Goods Regulations*, and the *BC SRR*, as amended or replaced from time to time.

<sup>3</sup> As per *Fisheries Act*: A deleterious substance is substance that, if added to any water, would degrade, alter, or form part of a process of degradation or alteration of the quality of that water, so that it is rendered or is likely to be rendered deleterious to fish or fish habitat or to the use by man of fish that frequent that water.

<sup>4</sup> as per *BC SRR*: A substance listed in the Schedule of the *BC SRR* identified as Items 1 to 24 (in the schedule) but not including item 25 natural gas. This may include but not limited to dangerous goods from Class 1 to Class 9, hazardous wastes as defined in the *HWR* such as waste oil, PCBs, and leachable toxic waste, or other substances which can cause pollution or are deleterious as described in Footnote No. 9 above.



FLUID	ACTIVE INGREDIENT	PACKAGING	SPILL THRESHOLD <sup>2</sup>	POSSIBLE LOCATIONS
Flammable Paint (Class 3)	Solvents	Open Pail, etc.	100 L	Outside Construction
Corrosive Resins (Class 8)	Epoxy Resin	500ml to 38 L containers	5 kg or 5 L	Stores
Lead Acid Battery (Class 8)	Lead and Sulphuric Acid	Size of battery	5 kg or 5 L	Stores
Caustic Soda 25% (Class 8)	Sodium Hydroxide	Tote	5 kg or 5 L	CWTS and Purification Pond (TP10)
Envirobind PCW and 834F	Soap + tackifier agent	Tote or Tank	200 kg or 200 L	Empty Coal Cars and Coal Barge
Coagulant: Carbonet CK-311	Polyaluminum Chloride	Tote	5 kg or 5 L	Coal Water Treatment Plant
Flocculent: Carbonet CE-633	Anionic Polyacrylamide	Tote	5 kg or 5L	Coal Water Treatment Plant
Coal <sup>5</sup>	None	Bulk	200kg	Shiploaders
Potash <sup>6</sup>	None	Bulk	Any Amount	Shiploaders

<sup>5</sup> Even though coal is non-toxic, not deleterious and not a transportation of dangerous goods-controlled substance, Neptune elects to consider that in sufficient quantity, this product may “cause pollution”. Coal is thus classified as an Item 24 Substance, in the Schedule to the BC SRR with a reportable level of 200 kg.

<sup>6</sup> See Footnote No. 11 above.



**Table C-4: Spill Report Form**

<b>Incident Information:</b>			
Date of Incident:	Investigation Team:		
Time of Incident:	Name:		
Date of Investigation:	Position:		
<b>Person Reporting Incident:</b>			
Name:	Man #:	Job Title:	Years of Experience:
<b>Type of Incident:</b>			
<input type="checkbox"/> Fuel Spill <input type="checkbox"/> Other Spill <input type="checkbox"/> Water Pollution/Contamination <input type="checkbox"/> Breach of Permit Conditions			
<input type="checkbox"/> Uncontrolled Air Emission <input type="checkbox"/> Management of Waste <input type="checkbox"/> Explosion <input type="checkbox"/> HVAC Release			
<input type="checkbox"/> Damage to Vegetation or Fauna <input type="checkbox"/> Excessive Noise <input type="checkbox"/> Near Miss			
<input type="checkbox"/> Other Type of Incident (please describe):			
<b>Other/Additional Comments:</b>			
<b>Type of Impact:</b>			
<input type="checkbox"/> Effects on Natural Environment of Land <input type="checkbox"/> Controlled/Uncontrolled Discharges to Water			
<input type="checkbox"/> Controlled/Uncontrolled Emissions to Air Wastes <input type="checkbox"/> Noise, Dust, Vibration, Odour			
<input type="checkbox"/> Contamination <input type="checkbox"/> Health and Safety (i.e., any injuries) <input type="checkbox"/> Solids and Other			
<input type="checkbox"/> Other Type of Impact (please describe):			
<b>Other/Additional Comments:</b>			
<b>Incident Specifics:</b>			
Incident Location:			
Distance to nearest stream, water bodies, sensitive areas (as applicable):			
Material Type:			
Material Quantity:			



Weather Conditions:				
Cause(s) and Effect(s) of Incident:				
Witness Names and Statements <i>(attach extra sheets if necessary)</i> :				
Description & Estimate of Property Damage:				
Item #	Corrective Action	Person Responsible	Target Date	Completed (Initial)
Is this a reportable incident? <input type="checkbox"/> Yes <input type="checkbox"/> No				
<i>Please refer to Table 16 of Environmental Management System Manual for Reportable Volumes for Spills to the Environment (as applicable).</i>				
Agencies contacted in the event of a reportable incident:  <input type="checkbox"/> BC Spill Reporting Hotline (1-800-663-3456)  <input type="checkbox"/> Environment Canada (604-666-6100)  <input type="checkbox"/> Transport Canada (604-666-2955)  <input type="checkbox"/> CANUTEC [Canadian Transport Emergency Centre] (613-996-6666)  <input type="checkbox"/> ICBC (1-800-910-4222)  <input type="checkbox"/> Police/Fire Dept. (911)  <input type="checkbox"/> Others:			NOTES:	





Other comments/actions taken:

Measures to be implemented to prevent/minimize this type of incident from occurring again:

Report completed by:

Phone #:

Title:

Date: