



SUNSHINE COAST REGIONAL DISTRICT

# CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN

MCNEIL, CHAPMAN & EDWARDS DAM IMPROVEMENTS,  
SECHELT, BC

June 12, 2023

CONFIDENTIAL





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MCNEIL, CHAPMAN &  
EDWARDS DAM  
IMPROVEMENTS, SECHELT,  
BC

SUNSINE COAST REGIONAL DISTRICT

FIRST ISSUE  
CONFIDENTIAL

PROJECT NO.: 211-09410-01  
DATE: JUNE 12, 2023

WSP  
840 HOWE STREET, SUITE 1000  
VANCOUVER, BRITISH COLUMBIA  
V6Z 2M1 CANADA

WSP.COM



June 12, 2023

Confidential

Sunshine Coast Regional District  
1975 Field Road  
Sechelt, BC  
V7Z 0A8

Attention: Bryan Shoji

Dear Sir:

Subject: Construction Environmental Management Plan – McNeil, Chapman, and Edward  
Lake Dam Upgrades

WSP Canada Inc. is pleased to submit a PDF copy of the Construction Environmental Management Plan report for the above-referenced project.

We trust that the enclosed report meets your current requirements. If you have any questions regarding this project, the enclosed reports, or our services, please do not hesitate to call the undersigned at (780) 410-6856.

Thank you for utilizing our professional services. We look forward to serving your future environmental and engineering needs.

Yours sincerely,

Mark Visser, B.Sc., RP.Bio., P.Biol.  
Experienced Fisheries Biologist,  
Earth & Environment

Encl. Construction Environmental Management Plan

WSP ref.: 211-09410-01

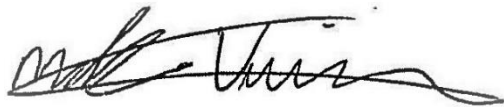
# REVISION HISTORY

FIRST ISSUE			
April 28, 2023	Issued for Tender		
Prepared by	Approved By		
Mark Visser, Experienced Fisheries Biologist, ECO & EIA	Michael Taylor, Group Lead, ECO&EIA – Lower Mainland		
SECOND ISSUE			
June 12, 2023	Updated based on comments from Ministry of Forest		
Prepared by	Approved By		
Mark Visser, Experienced Fisheries Biologist, ECO & EIA	Michael Taylor, Group Lead, ECO&EIA – Lower Mainland		

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# SIGNATURES

## PREPARED BY



June 12, 2023

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Mark Visser, B.Sc., P.Biol., RP.Bio.  
Experienced Fisheries Biologist, ECO & EIA

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Date

## APPROVED<sup>1</sup> BY



June 12, 2023

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Michael Taylor, BLA, MRM, RPP, MCIP  
Group Lead, ECO&EIA

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Date

WSP prepared this report solely for the use of the intended recipient, Sunshine Coast Regional District, in accordance with the professional services agreement between the parties. In the event a contract has not been executed, the parties agree that the WSP General Terms for Consultant shall govern their business relationship which was provided to you prior to the preparation of this report.

The report is intended to be used in its entirety. No excerpts may be taken to be representative of the findings in the assessment.

The conclusions presented in this report are based on work performed by trained, professional and technical staff, in accordance with their reasonable interpretation of current and accepted engineering and scientific practices at the time the work was performed.

The content and opinions contained in the present report are based on the observations and/or information available to WSP at the time of preparation, using investigation techniques and engineering analysis methods consistent with those ordinarily exercised by WSP and other engineering/scientific practitioners working under similar conditions, and subject to the same time, financial and physical constraints applicable to this project.

WSP disclaims any obligation to update this report if, after the date of this report, any conditions appear to differ significantly from those presented in this report; however, WSP reserves the right to amend or supplement this report based on additional information, documentation or evidence.

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Benchmark and elevations used in this report are primarily to establish relative elevation differences between the specific testing and/or sampling locations and should not be used for other purposes, such as grading, excavating, construction, planning, development, etc.

Design recommendations given in this report are applicable only to the project and areas as described in the text and then only if constructed in accordance with the details stated in this report. The comments made in this report on potential construction issues and possible methods are intended only for the guidance of the designer. The number of testing and/or sampling locations may not be sufficient to determine all the factors that may affect construction methods and costs. We accept no responsibility for any decisions made or actions taken as a result of this report unless we are specifically advised of and participate in such action, in which case our responsibility will be as agreed to at that time.

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This limitations statement is considered an integral part of this report.

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# 1 INTRODUCTION

The Sunshine Coast Regional District (SCRD) retained WSP Canada Inc. (WSP) to develop a Construction Environmental Management Plan (CEMP) for the rehabilitation works to the McNeil Lake Dam, Chapman Lake Dam and Edwards Lake Dam (referred to collectively as the “Project”; individually referred to as the “Site”).

The purpose of this CEMP is to assist the SCRД and its Contractor(s) in adhering to applicable environmental legislation by providing environmental requirements, standard protocols, and mitigation measures to reduce the potential for adverse environmental effects that could result from Project. Changes in the Project scope of work will require updates to the CEMP to reflect potential changes in environmental risks. An up-to-date copy of the CEMP will be kept on site for reference.

The specific objectives of this CEMP are to provide the following:

- Provide an overview of key environmental issues related to dam rehabilitation works.
- Identify relevant regulatory requirements.
- Identify responsibility for environmental management and structure.
- Identify best management practices (BMPs) and mitigation measures to mitigate, and where possible, avoid or reduce potential adverse effects to terrestrial and aquatic resources including species at risk and sensitive habitats.

This CEMP provides the template for the primary document to guide overall environmental management practices to be implemented during all phases of the Project. This CEMP, will include project specific information, is intended to be a “living” document and can be updated as new information becomes available.

## 2 PROJECT LOCATION CONSTRUCTION COMPONENTS AND SCHEDULE

### 2.1 PROJECT LOCATION

McNeil Lake Dam is located near Madeira Park, BC and Chapman Lake Dam and Edwards Lake Dam are both located within Tetrahedron Provincial Park, near Sechelt, BC (Appendix A, Figure 1).

### 2.2 CONSTRUCTION COMPONENTS

The SCR D is proposing to undertake improvements of three a reinforced concrete dam (McNeil Lake Dam, Chapman Lake Dam, and Edward Lake Dams).

- McNeil Lake Dam, originally built in 1965, is a reinforced concrete gravity dam, 18.3 m long and 4.0 m high that was raised by 0.9 m and four concrete buttresses installed in 1976.
- Chapman Lake Dam, originally built in 1978, is a reinforced concrete gravity dam, 35 m long and 3.7 m high and is founded on bedrock.
- Edward Lake Dam, originally built in 1991, is a reinforced concrete gravity dam, 11 m long and 5.5 m high.

During the 2020 Dam Safety Review (DSR), deficiencies and non-conformances of the dams were observed. To ensure the Dams comply to current Canadian standards, improvements to the dams are required. Table 2.1 provides a description of the proposed upgrade works for each Site.

**Table 2.1 Proposed works and upgrades at each dam.**

SITE NAME	PROPOSED WORK AND UPGRADES
McNeil Lake Dam	<ul style="list-style-type: none"><li>— Raising the steel walkway and platform above Inflow Design Flood (IDF) level with appropriate freeboard. The existing platform will be removed, with a new platform installed on concrete columns.</li><li>— Revised access down to left bank of dam to suit new raised platform.—Replacement of handrail along right wing wall.</li><li>— Replacement of existing stoplogs with new stoplogs and associated stoplog hoist rack.</li><li>— Removal of existing low level outlet valve and replacement with new low level outlet gate, complete with beaver screen.</li><li>— Erosion protection measures at the left abutment.</li><li>— Security gate and fencing provide at and right and left ends of platform to restrict access onto the steel walkway and platform.</li><li>— Installation of Standard Vertical Staff Gauge.</li><li>— Provide signage in accordance with BC Dam Safety Regulations.</li><li>— Undertake site investigations to confirm depth of bedrock at right abutment.</li></ul>

Chapman Lake Dam	<ul style="list-style-type: none"> <li>— Dam strengthening.</li> <li>— Raising the existing steel walkway and platform above Inflow Design Flood (IDF) level with appropriate freeboard.</li> <li>— Installation of debris booms.</li> <li>— Erosion protection measures.</li> <li>— Modifications to low level outlet,</li> <li>— Security gate and fencing provide at and right ends of platform to restrict access onto the steel walkway and platform.</li> <li>— Installation of Standard Vertical Staff Gauge.</li> <li>— Provide signage in accordance with BC Dam Safety Regulations.</li> </ul>
Edward Lake Dam	<ul style="list-style-type: none"> <li>— Raising the existing steel walkway and platform above Inflow Design Flood (IDF) level with appropriate freeboard.</li> <li>— Installation of debris booms.</li> <li>— Replacement/modifications to stoplog lifters and low-level outlets.</li> <li>— Security gate and fencing provide at left ends of platform to restrict access onto the steel walkway and platform.</li> <li>— Installation of Standard Vertical Staff Gauge.</li> <li>— Provide signage in accordance with BC Dam Safety Regulations.</li> </ul>

## 2.3 PROJECT SCHEDULE

The Project is anticipated to occur over a 3-month period in the summer of 2023. A detailed schedule outlining major phases of the Project should be detailed in the Contractor(s) Environmental Protection Plan.

Construction activities within the wetted perimeter of McNeil Lake, Chapman Lake and Edwards Lake will need to consider the below least risk fish timing window.

### 2.3.1 TIMING WINDOWS

#### 2.3.1.1 LEAST RISK TO FISH TIMING WINDOW

The least risk to fish timing window for each Site is summarized below:

- McNeil Lake: August 1<sup>st</sup> to October 31<sup>st</sup>.
- Chapman Lake: August 1<sup>st</sup> to October 31<sup>st</sup> for Rainbow trout and June 15<sup>th</sup> to August 31<sup>st</sup> for Dolly varden
- Edwards Lake: As no fish are present there is no least risk period and work can occur anytime during the year.

Construction activity within the wetted perimeter of the above Sites will be required to occur within the least risk to fish timing window.

Refer to Section 6.2.1 for further details regarding protection of fish and fish habitat.

### 2.3.1.2 WILDLIFE BIRD PROTECTION WINDOWS

Timing windows for the protection of birds at all the Sites are as follows:

- The general bird-breeding season is March 1<sup>st</sup> to August 31<sup>st</sup> (BC MOE, 2014).
- The raptor-breeding window is January 1<sup>st</sup> to August 31<sup>st</sup> (BC, MOE, 2013).
- Marbled Murrelet nesting period is from Early April to Late September.
- Nests of bald eagle, golden eagle, peregrine falcons, gyrfalcons, ospreys, and herons are protected year-round under the *Wildlife Act* (BC, MOE, 2013).

Timing window for protection of wildlife (amphibians, reptiles, mammals) surrounding McNeil Lake Dam are as follows:

- Avoid construction during amphibian breeding window for aquatic environments which is anticipated to be early spring until August before tadpole emergence.
- Avoid construction during the overwintering period when western painted turtle are potentially in a state of brumation in the soft lake substrate.

Refer to Section 6.2.5 for further details regarding protection of wildlife.

### 3 ENVIRONMENTAL SETTING

The information below is based on a review of the following assessment report completed for the Project:

- *Environmental Impact Assessment – McNeil Dam Improvements* (WSP, 2022a)
- *Environmental Impact Assessment – Upgrades to Chapman Lake and Edwards Lake Reinforced Concrete lake Dams* (WSP, 2022b)

A summary of existing environmental conditions is described below:

- McNeil Dam: McNeil Lake Dam controls water flow from McNeil Lake (Waterbody ID: 00741JERV) downstream into Haslam Creek (Watershed Code: 900-135300)
  - McNeil Lake (00741JERV) a man-made reservoir that contains Coastal Cutthroat Trout, and Threespine Stickleback.
  - Haslam Creek (900-135300) is a 3<sup>rd</sup> order watercourse which flows into the Malaspina Strait. According to provincial mapping and fisheries information, Haslam Creek contains Coastal Cutthroat Trout and Chum Salmon. Coastal Cutthroat Trout is a provincially blue-listed species and is a species of conservation concern. Based on the Fisheries and Oceans Canada (DFO) Aquatic Species at Risk map no critical habitat is present at the Site (DFO, 2022a).
- Chapman Lake Dam controls water flow from Chapman Lake (Waterbody ID: 00796JERV) and Chapman Creek (Watershed Code 900-120400). Chapman Creek is a 3<sup>rd</sup> order stream that flows into the Strait of Georgia and is designated as a sensitive creek in Schedule B of the *Water Sustainability Act*.
  - A series of falls downstream from the dam itself create impassable barriers upstream to fish.
  - Chapman lake has historical records for presence of Dolly varden and Rainbow trout, the latter captured in a small tributary upstream of the Lake.
  - Downstream of Chapman Lake and below the fish barriers eight species including seven salmonids have been recorded.
- Edwards Lake Dam controls water flow from Edwards Lake (Waterbody ID: 00779JERV) into a small unnamed tributary that flows to Chapman Creek.
  - Edwards Lake and the small downstream tributary has no historical fish records available and may be due to the presence of fish barriers downstream.

Mitigation measures as described below will be implemented to reduce potential effects of the dam rehabilitation works to McNeil Lake, Chapman Lake, and Edwards lake.

## 4 REGULATORY CONTEXT

The SCRD and the Contractor(s) will adhere to all laws and regulations of the federal, provincial, and municipal bylaws and guidelines. Where such requirements have not been identified by the CEMP, it is the responsibility of the Contractor to ensure they have obtained the necessary permits and approvals. The Contractor shall ensure that copies of all permits and approvals are always available on site.

The following are key provincial and federal approvals/permits that have/will be obtained for the Project:

- A DFO Request for Review application has been submitted to DFO for each Site on February 7, 2023.
  - A Letter of Advice (LoA # 23-HPAC-00145) was received on April 11, 2023, for the works on McNeil Lake Dam. The terms and conditions of the Letter of Advice must be followed during construction (Expires April 11, 2024).
  - A Letter of Advice (LoA # 23-HPAC-00153) was received on April 25, 2023, for the works on Chapman Lake Dam. The terms and conditions of the Letter of Advice must be followed during construction (Expires April 25, 2024).
  - A Letter of Advice (LoA # 23-HPAC-00151) was received on April 25, 2023, for the works on Edwards Lake Dam. The terms and conditions of the Letter of Advice must be followed during construction (Expires April 25, 2024).
- An application for a Change Approval has been submitted to the Ministry of Forest lands and Natural Resource Operations (MOF) for the Project on August 16, 2022. A response from MOF has not been obtained; however, the terms and conditions of the Approvals will be followed during construction.

Relevant regulatory requirements pertinent to the Project are include in Table 4.1; however, this list is not exhaustive, and the Contractor should be aware that other acts, regulations and guidelines may apply.

**Table 4.1 Summary of Applicable Federal and Provincial Legislation**

LEGISLATION	PURPOSE	RELATIONSHIP TO PROJECT
<b>Federal</b>		
<i>Fisheries Act (1985), 2019 amendment</i>	The <i>Fisheries Act</i> (1985) provides provisions for protection of fish and fish habitat including freshwater and marine fisheries resources. The 2019 amendment restores the prohibition against HADD of fish habitat (Subsection 35[1]) and protects all fish species and their life stages [Subsection 34.4[1]]. The introduction of deleterious substances, such as soils, sediments, hydrocarbons, contaminated materials, or hydraulic fluids into any watercourse would be considered unlawful under Section 36 of the Act (Government of Canada [GOC], 1985).	As not all measures to protect fish and fish habitat can be complied with during the proposed rehabilitation works the <i>Fisheries Act</i> applies and a Request for Project Review application to DFO was submitted for each Dam on February 7, 2023. No work can occur until approval under the <i>Fisheries Act</i> has been obtained.  DFO's measures to protect fish and fish habitat (DFO, 2022b) and any conditions of the approvals from DFO will be implemented to protect fish and fish habitat.
<i>Migratory Birds Convention Act</i>	The <i>Migratory Birds Convention Act</i> (1994) implements an internationally recognized convention between Canada and the United States to protect various species of migratory game birds, migratory insectivorous birds, and migratory non-game birds. This Act prohibits disturbance and	Due diligence will need to be demonstrated during vegetation clearing and grubbing to reduce the risk of incidental take (i.e., inadvertent destruction of migratory birds, their nests or eggs). This may include applying

	destruction of migratory birds, their nests or eggs and the deposition of substances harmful to migratory birds. The Migratory Birds Regulations and the Migratory Birds Sanctuary Regulations protect migratory birds under this Act (GOC, 1994).	timing windows, completing bird nest surveys, and establishing setback buffers around active nests. No permits or approvals are anticipated to be required.
<i>Species at Risk Act (SARA)</i>	The <i>Species at Risk Act</i> (2002) protects Canadian indigenous species, subspecies, and distinct populations from becoming extirpated or extinct, provides for the recovery of endangered or threatened species, and encourages the management of other species to prevent them from becoming at-risk. It is prohibited to kill, harm, harass, capture, or take wildlife listed as Extirpated, Endangered or Threatened under this Act. The Act prohibits damage to residences or critical habitat of listed species and applies only on federal land with the exception of aquatic species and migratory birds listed in the federal <i>Migratory Birds Convention Act</i> , 1994. In some circumstances, the federal prohibitions can be applied to other species on private or provincial Crown land if it is deemed that provincial or voluntary measures do not adequately protect a species and its residence (GOC, 2002).	<p>All three sites are located within designated critical habitat for Marbled Murrelet and McNeil Lake dam is also located within designated critical habitat for Western painted turtle.</p> <p>Due diligence requires assessment and measures to protect at-risk species and their habitat. Permits would be necessary for capture and relocation of any at-risk species on federal land. No permits are anticipated for the Project Works.</p> <p>Implementation of appropriate mitigation in Section 6 to protect these species will be required.</p>
<b>Provincial</b>		
<i>Environmental Management Act</i>	Regulates the discharge or emission of effluent, waste or contaminants and requires spill reporting for certain substances. Prohibits causing pollution (Government of BC, 2003a).	Permits would be required for discharge or emission of effluent, waste or contaminants including pesticides and herbicides.
<i>Integrated Pest Management Act</i>	The <i>Integrated Pest Management Act</i> outlines regulations, prohibitions, restrictions, and permits for use of pesticides in BC (Government of BC, 2003b).	Permits may be required if pesticides are used to manage specific invasive plant species within the Project Area.
<i>Weed Control Act</i>	The <i>Weed Control Act</i> mandates a duty to control noxious weeds by landowners (Government of BC, 1996a).	Requires the control of noxious weeds within the Project Area.
<i>Water Sustainability Act</i>	The <i>Water Sustainability Act</i> ensures that water quality, quantity (i.e., for licensed users), and riparian habitat are not compromised when there are changes in and about a stream (includes a lake, pond, river, creek, spring, ravine, gulch, wetland or glacier, whether or not usually containing water, including ice, but does not include an aquifer). The release of debris, refuse, carcasses, human or animal waste, pesticides, fertilizers, contaminants, or another matter of substance is prohibited unless authorized under this enactment or another. (Government of BC, 2014).	The proposed rehabilitation works require a Change Approval for changes in and about a stream under Section 11 of the WSA. No work can occur until approval under the WSA has been obtained.
<i>Wildlife Act</i>	<p>The BC <i>Wildlife Act</i> (1996) protects wildlife and wildlife habitat in British Columbia by identifying wildlife areas, defining human interactions with wildlife, and regulating hunting, trapping and angling. Section 34 of the <i>Act</i> prohibits possessing, taking or destroying (Government of BC, 1996b):</p> <ul style="list-style-type: none"> <li>(i) a bird or its egg,</li> <li>(ii) the nest of an eagle, peregrine falcon, gyrfalcon, osprey, heron or burrowing owl, or</li> </ul>	<p>If vegetation clearing is to occur within the breeding bird window (1 March – 30 August; BC MOE, 2014a), a bird nest survey should be completed by a Qualified Environmental Professional to reduce the risk of inadvertent destruction of birds, their nests or eggs.</p> <p>Implementation of mitigation in Section 6 will be required to comply with the <i>Wildlife Act</i>.</p>

	the nest of a bird not mentioned in (ii), when the nest is occupied by a bird or its egg unless authorized under permit.	
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## 5 ROLES AND RESPONSIBILITIES

The project contact list for the works proposed in this CEMP is provided in Table 5.1. Additional details on responsibilities of each role are described below.

**Table 5.1 Summary of Applicable Federal and Provincial Legislation**

ROLE	COMPANY	PRIMARY CONTACT	EMAIL/PHONE
Owner	Sunshine Coast Regional District	Bryan Shoji	<a href="mailto:Bryan.Shoji@scrd.ca">Bryan.Shoji@scrd.ca</a> 604-212-1200
Engineer Lead	WSP	Rob Moore	<a href="mailto:Rob.Moore@wsp.com">Rob.Moore@wsp.com</a> 604-601-6842
Contractor	TBD	TBD	TBD
WSP Environmental Contact	WSP	Mark Visser	Mark.Visser@wsp.com 780-410-6856
Environmental Monitor	TBD	TBD	TBD

### 5.1 OWNER (SUNSHINE COAST REGIONAL DISTRICT)

SCRD has overall responsibility for the administration of contracts, including their environmental requirements which includes the following:

- Overall responsibility for compliance with all environmental regulatory requirements.
- Delegates authority and communicates requirements as required on all aspects of the Project.
- Communicates directly with regulatory agencies, interested, and potentially affected First Nations, and public stakeholders, as required.
- Ensure that the Contractor is aware of the environmental requirements of the work and are trained and competent to implement them.
- Ensure effective environmental communication with the Contractor to ensure that environmental responsibilities and requirements are understood prior to the commencement of the Project and are implemented through tailboard and other meetings.

### 5.2 CONTRACTOR

The Contractor will be responsible for adhering to proposed environmental mitigation measures and regulatory requirements outlined in this CEMP and regulatory approvals. In meeting the environmental requirements of the Project, the Contractor will be required to:

- Confirm the on-site crew have an appropriate level of training and competency to perform the work.



- Evaluate effective communication to confirm the on-site crew are aware of the environmental issues and requirements, and their responsibilities are understood prior to the commencement of work.
- Implement appropriate work procedures and controls to prevent and/or reduce the potential for adverse environmental impacts.
- Inspect the work practices to evaluate adherence to regulatory and CEMP requirements.
- Appoint an Environmental Monitor (EM) to evaluate and report on compliance of the work procedures and practices with environmental requirements established in this CEMP.
- Develop a site-specific Environmental Protection plan in collaboration with the EM, to be reviewed and approved by the SCRD prior to construction.
- Verify that emergency spill response materials are available on site for immediate use and appropriately stocked.
- If emergency spill response is required, the Contractor will be responsible for implementation of spill response measures and implementation of spill clean up activities.
- In the event of release of deleterious substances, that requires Spill Reporting under the Spill Reporting Regulations (Government of BC, 2017). The Contractor will be responsible for reporting the spill to the Provincial Environmental Emergency Program (24-hour phone number: 1-800-663-3456) and documenting the clean up of the spill.
- Respond immediately and effectively to environmental incidents including leaks and spills.

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### 5.3 ENVIRONMENTAL MONITOR (EM)

The EM will work under the supervision of a Qualified Environmental Professional (QEP) with experience reviewing construction activities near environmental sensitivities. Responsibilities of the EM include the following:

- The EM in collaboration with the Contractor will need to develop a site-specific Environmental Protection Plan to be reviewed and approved by the SCRD prior to construction.
- Attend pre-job and/or tailboard meetings and communicate environmental sensitivities and environmental requirements of the work to on-site crew.
- Monitor the Contractors adherence to environmental requirements and evaluate the effectiveness of the mitigation measures being implemented.
- Available to be on site fulltime during works within 30 m of any watercourse to monitor that there are no Project interactions with McNeil, Chapman or Edward Lake and the associated environment.
  - If Operations are deemed to be low risk by the EM or QEP, monitoring can be decreased to part-time.
- Provide recommendations to the Contractor for installing and/or improving environmental controls and mitigation measures to avoid and reduce potential for environmental incidents.
- The EM has authority to stop work in circumstances that pose immediate risk to the environment or public or are in non-compliance with regulatory approvals.
  - Issuing of a stop work order must be immediately reported to the SCRD followed by a written report outlining the circumstances of the stop work order and any actions that were taken.
- Make visual observations during dam rehabilitation works and conduct water quality monitoring (as required).

- Provide the Contractor and SCRD (or their representative) with daily monitoring reports summarizing construction activities, implementation and effectiveness of mitigation measures and associated recommendations, any environmental incidents and non-compliant events, and corrective actions taken.

## 6 POTENTIAL EFFECTS AND MITIGATION MEASURES

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### 6.1 POTENTIAL EFFECTS

Potential environmental effects that may be encountered during the rehabilitation works include the following:

- Potential effects on riparian and aquatic resources
  - Increase in contaminant concentrations may occur from the accidental release of deleterious substances from construction equipment.
  - Introduction of invasive plant species
  - Direct/indirect effects to native vegetation
  - Direct/indirect effects to listed wildlife species of conservation concern due to Project noise and human disturbance and changing water levels
  - Attraction of wildlife to the work area due to garbage and / or food waste (e.g., bears).
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### 6.2 ENVIRONMENTAL MITIGATION MEASURES

The following environmental mitigation measures should be implemented during the work activities to achieve compliance with the Project's environmental requirements:

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#### 6.2.1 FISH AND FISH HABITAT PROTECTION

The following mitigation measures to avoid the death of fish or the harmful alteration, disruption, or destruction (HADD) of fish habitat are to be implemented during the Project:

- Work will occur during the least-risk window for each Site described in Section 2.3.1.1.
- Schedule work to avoid wet, windy, or rainy periods.
- Limit vegetation removal and ground disturbance to as much as possible to carry out the works and delineate any riparian area setbacks or areas not to be cleared.
  - Utilize existing cleared areas for access, laydown/staging areas, etc. where possible.
- Avoid the release of deleterious or hazardous substances into watercourse or waterbody.
  - A release of a deleterious substance that enters or is likely to enter any waterbody or watercourse must be reported to the Provincial Environmental Emergency Program (1-800-663-3456) with appropriate follow up reporting.

- Erosion and sediment control (ESC) provisions will be implemented prior to construction and in accordance with DFO's *Measures to Protect Fish and Fish Habitat* (DFO, 2022b) and *Land Development Guidelines for the Protection of Aquatic Habitat* (DFO and BC MOE, 1993).
- Ensure equipment arrives on site in a clean condition and is maintained free of fluid leaks, invasive species, or soils from other sites.
- Equipment working adjacent to or in any waterbody shall operate using biodegradable hydraulic fluids or be inspected prior to the start of work and at the beginning of each shift to ensure they have no leaks.
- All equipment operating adjacent to any waterbody will require a spill kit and a larger spill kit will be present at the top of bank. The Contractor will be responsible for providing and deploying the spill response measures, if required. Appropriate quantities of spill kit supplies should be kept on site as appropriate for the volume of deleterious substance that are present, should an uncontrolled release occur.
- Refuel and wash equipment off site or at least 30 m away from the top of bank of waterbodies or watercourses.
- All work should take place from above the top of bank. If work is required to occur below the top of bank the following will be implemented:
  - Work should be completed in such a way to prevent bank instability.
  - The site should be isolated to avoid unnecessary impacts and sedimentation to the aquatic environment.
  - A fish salvage will be undertaken, by the EM, prior to any works taking place within an isolated area.
    - A Fish Collection permit from the appropriate regulatory authorities will be required prior to the fish salvage occurring.
- The Contractor will be required to always maintain flow to the downstream creeks. If construction activities will impact flows at the site, the Contractor will be required to provide a plan to the Owner on who they will maintain flows downstream.

The Contractor is responsible for maintaining conditions that protect the environment not only during active construction on the Site, but also during periods when the Contractor has suspended its construction activity for any reason. The EM will monitor any turbidity plumes (visual and with a turbidity meter) and hydrocarbon sheens (visual) at the sites.

Requirements for Total Suspended Solids (TSS) in site runoff water are outlined in the *Land Development Guidelines for the Protection of Aquatic Habitat* (Chilibeck et al., 1993). Visual assessment and *in-situ* measurements will be taken upstream and downstream of the Project Area to provide background levels for comparison. Turbidity will be used as a substitute measure for suspended solids. If sediment-laden water is encountered as a result of construction work and/or environmental incidents, and if turbidity levels exceed the thresholds outlined in Table 6.1 below, the EM will inform the Contractor(s) and corrective measures will be implemented. A turbidity meter will be available on-site during the work.

**Table 6.1 BC Summary of Water Quality Guidelines for Freshwater Aquatic Life <sup>1</sup>**

PARAMETER	MAXIMUM ALLOWABLE
Turbidity	<ul style="list-style-type: none"><li>— Change from background of 8 NTU at any one time for a duration of 24 hours in all waters during clear flows or in clear waters</li><li>— Change from background of 2 NTU at any one time for a duration of 30 days in all water during clear flows or in clear waters</li><li>— Change from background of 5 NTU at any time when background is 8 to 50 NTU during high flows or in turbid waters</li><li>— Change from background of 10% when background is &gt;50 NTU at any time during high flows or in turbid waters</li></ul>
Suspended Solids	<ul style="list-style-type: none"><li>— Change from background of 25 mg/L at any one time for a duration of 24 hours in all waters during clear flows or in clear waters</li><li>— Change from background of 5 mg/L at any one time for a duration of 30 days in all waters during clear flows or in clear waters</li><li>— Change from background of 10 mg/L at any time when background is 25 to 100 mg/L during high flows or in turbid waters</li><li>— Change from background of 10% when background is &gt;100 mg/L at any time during high flows or in turbid waters</li></ul>
pH <sup>2</sup>	<ul style="list-style-type: none"><li>— Restricted changes in pH where background levels are less than 6.5. No statistically significant decrease in pH from background levels are permitted</li><li>— Unrestricted change in pH within the range of 6.5 to 9.0</li><li>— Restricted changes in pH where background levels are greater than 9.0. No statistically significant increase in pH from background levels are permitted.</li></ul>

<sup>1</sup> Source: Tables 30, 44; NTU - nephelometric turbidity units;<sup>2</sup> Statistical significance is determined as outlined in Table 30 footnotes (British Columbia Ministry of Environment and Climate Change Strategy, 2021)

## 6.2.2 SOIL MANAGEMENT

Although it is unlikely that soil will be removed and stockpiled during the Project, proper soil storage must be implemented. The following mitigation will be implemented where soil handling or storage of uncontaminated soil is anticipated:

- Uncontaminated soil may be temporarily stockpiled on-site in a location that minimizes the risk of sediment entering any surrounding ditches, drainages, watercourses or waterbodies.
  - Erosion and sediment controls (ESC) will be installed by the Contractor around all soil stockpiles and inspected daily.
  - If soil material is to be stockpiled for more than seven days or during periods of rainfall or wind, it will be covered with polyethylene sheeting that is anchored securely to prevent displacement by wind or migration from the bottom.
  - Stockpiles will be located greater than 15 m from the top of bank of any waterbody.
- If stockpiles become a source of siltation within any ditches, drainages, watercourses or waterbodies, the Contractor must immediately remedy the siltation as necessary to the satisfaction of the EM.

- Should area constraints at the Sites be identified, the Contractor will complete a site-specific Soil Management Plan to determine appropriate locations for potential stockpiles prior to any soil stockpiling or soil removal activities.

If contaminated soils are uncovered during construction activities, the soil must be handled, transported, and disposed of in accordance with the BC *Environmental Management Act* and its Regulations (Contaminated Sites Regulation and Hazardous Waste Regulation), and the federal Canadian Council of Ministers of the Environment (CCME) Guidelines and Transportation of Dangerous Goods (TDG) Regulations (GOC, 2001). The Contractor(s) must not remove surplus soil from the Sites before the EM has assessed the proposed soil disposal location.

If soil odour, debris, discolouration and/or water sheen is encountered during construction activities, the Contractor(s) must:

- Stop work and contact the SCRD and EM immediately to report the location and nature of the suspected contamination;
- Under the supervision of an appropriately trained Environmental Professional (or delegate), segregate these soils from potentially un-contaminated soils during excavation;
- Arrange with EM for sampling, analysis, and removal/disposal options of the contaminated soils;
- Stockpile soils on polyethylene sheeting (6 mil or greater) at least 30 metres from any ditch, drainages and/or other waterbodies;
- Cover each pile with polyethylene sheeting to prevent erosion, silt and/or contaminant runoff.
- If stockpiling the soil is not possible, the EM will arrange for the soils to be handled as inferred contaminated. The suspect soils will be removed from site by a licensed carrier for direct transport to a permitted facility.
- The contractor(s) must be prepared with the following materials in the event that contaminated soil and/or water is encountered:
  - Six mil (or greater) polyethylene sheeting to place contaminated soils on, and cover the soils with;
  - Sufficient, non-erodible ballast material to secure the polyethylene sheeting on the contaminated soil;
  - Ample oil absorbent materials;
  - Shovels;
  - Waterproof drums

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### 6.2.3 EROSION AND SEDIMENT CONTROL

Any work with the potential for ground disturbance has the potential to result in increased suspended sediment which may affect fish and fish habitat. The following mitigation will be implemented where ground disturbance is anticipated:

- Utilize existing access routes, where possible.
  - Access route and work areas shall be clearly marked such that adjacent riparian vegetation is not disturbed.
  - Vehicles/equipment will be restricted to designated work areas and access routes
- ESC will be implemented by the Contractor prior to the start of construction activities.

- ESC measures will be inspected daily by the Contractor. Damaged or ineffective ESC measures will be repaired or replaced within 24 hours, as required
- ESC measures, if installed, will be removed from site when no longer needed.
- Additional ESC materials will be stockpiled on site for use in any emergency situation that may arise
- Sandbags will be available to create check dams and/ or containment berms around the work areas. Pumps will be available to drain water within the work area if necessary.
  - Sediment-laden water will be pumped into a vegetated settling area away from any waterbody.
- Work will be suspended during intense rainfall events or whenever surface erosion occurs that may potentially affect conditions downstream.
- If ground disturbance occurs, temporarily disturbed areas will be graded, contoured, and seeded, following completion of the works to promote re-vegetation and to reduce surface erosion and/or proliferation of invasive weeds.
- Exposed areas will be stabilized and reseeded with native plants as quickly as is feasible to reduce erosion potential.

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#### 6.2.4 MATERIALS STORAGE, HANDLING AND WASTE MANAGEMENT

Cleanup of the site will be an ongoing process. Contractor(s) will, at all times, keep the work site free from accumulations of waste materials or rubbish caused by employees or by works. All garbage and recycling containment will be animal proof. Upon completion of work activities, the Contractor(s) will remove and properly dispose of all temporary structures, rubbish, and waste materials resulting from the operation.

The following mitigation measures will be implemented on-site by the Contractor(s), as required:

- All reasonable efforts will be made to reduce, reuse and/or recycle to reduce the amount of material being disposed of. All wastes will be disposed of in compliance with applicable legislation such as the *BC Environmental Management Act*.
- Hazardous waste registration, storage, permit and transportation requirements will be met, if applicable, and waste materials will be removed from the Project Area as soon as possible in accordance with applicable standards and regulations.
- If activities involve the handling, storage, and removal of hazardous wastes, the following records will be maintained: (1) Inventories of types and quantities of Hazardous Wastes generated, stored, or removed; (2) Manifests identifying Hazardous Waste haulers and disposal destinations; and (3) Disposal certification documents.
- Contractor(s) will be responsible for maintaining Safety Data Sheets (SDS) for all products used on the Project.
- Temporary sanitary facilities in the form of portable toilets will be provided during the Project. Sanitary facilities will be secured so they do not fall over and located in an area greater than 30 m from any watercourse or waterbody.
- If suspected contaminated materials are found during the works, they will be managed in accordance with the *BC Environmental Management Act* and Regulations.

The following mitigation measures will be implemented specifically for use of hydrocarbon-based materials:

- Plastic containers used to carry petroleum products will be designed for that purpose and will not be more than five years old.
- Containers will be fitted with a proper fitting cap or lid.
- All containers containing hydrocarbon products will be labelled and transported according to the Transportation of Dangerous Goods Regulations.
- Containers under 23 L (5 gallons) will be stored and transported in the equipment box of a vehicle that can contain the total quantity of the fuel in the container will it leak or spill.
- Containers greater than 23 L (5 gallons), including 205 L (45 gallon) drums, must be transported upright, and secured to prevent shifting and toppling.

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## 6.2.5 TERRESTRIAL RESOURCE MANAGEMENT

The following mitigation measures will be implemented to prevent, reduce, or manage potential effects on terrestrial resources (wildlife and vegetation):

- The amount of new disturbance and tree clearing will be reduced where possible. Clearing boundaries will be clearly marked, and vegetation outside the work area will not be disturbed.
  - Use existing access routes and laydown areas where possible.
- No tree removal is anticipated during the Project. If tree removal is required, removal activities will be reviewed by the EM prior to removal to minimize impacts and ensure the appropriate permitting is in place as per the Tree Replacement Criteria (MELP, 1996)
- Vegetation clearing and grubbing activities at the Sites will be conducted within the appropriate “least risk windows” outlined in *Develop with Care 2014: Environmental Guidelines for Urban and Rural Land Development in British Columbia* (BC MOE, 2014) to reduce potential contravention of Section 34 of the BC *Wildlife Act*, and concurrently, the federal *Migratory Birds Convention Act* for the protection of migratory birds and their nests. Where vegetation clearing and grubbing activities cannot happen within the least risk windows, pre-clearing bird nest surveys must be completed by a biologist with experience conducting these surveys. “Least risk windows” as defined by the *Develop with Care 2014* document (BC MOE, 2014) and presented in Section 2.3.1.2
  - Bird nesting window: March 1 – August 31<sup>st</sup>.
  - Raptor nesting window: January 1 – August 31<sup>st</sup>.
- Pre-clearing nest surveys for Marbled Murrelet will be completed within the construction area at McNeil Lake and Edwards Lake prior to construction by a qualified biologist. The qualified biologist will provide written mitigation and protection measures (e.g., setbacks, timing restrictions) to minimize effects to the species.
- Park equipment away from trees. Establish Tree Protection Zones (TPZ) if equipment is anticipated to be parked off existing access routes.
- Where vegetation is removed, native vegetation should be planted/seeded as soon as possible
- Food waste, garbage, refuse, and construction materials that could attract wildlife will be stored in an appropriate containment or removed from the Sites daily.
- Implement standard construction practices to minimize noise generation and air emissions.
- The Contractor will comply with posted driving speeds and be observant for wildlife that may cross roads or enter the Sites.



- Vehicle collisions with wildlife will be reported immediately to the EM.
  - Wildlife carcasses must not be moved or transported until permission is received from the local conservation officer (1-800-663-9453) except in the circumstances where it is required for a medical emergency or endangers personnel or road users' safety.
  - If wildlife carcasses are moved other than under the instruction of a Conservation Officer, their position and state prior to and post-moving must be documented.
  - Site personnel are reminded that carcasses or wounded animals frequently attract other, predatory, and scavenging wildlife, increasing the probability of wildlife encounters on-site.
  - Carcasses and remains located off-site but in the vicinity of the Project should, if identified, be reported as soon as possible to the EM, giving exact position and location directions, the EM will then be responsible for taking or initiating the requisite action.
- Other vegetation and wildlife-related encounters are to be reported within 24 hours to the EM and the SCRD.

McNeil Lake is in critical habitat for Western Painted Turtle. In addition to the above mitigations the following will be implemented at McNeil to protect critical habitat for Western Painted Turtle

- Avoid construction during the amphibian breeding window (early spring until August) and overwintering period.
- A qualified biologist will complete a pre-construction sweep of the construction area for signs of Western Painted Turtle and their critical habitat and provide written mitigation and protection measures (e.g., setbacks, timing restrictions) to minimize effects to the species and their habitat.
- Develop and Implement ESC measures prior to construction (Section 6.2.2 and 6.2.3).
- Prevent the introduction and spread of invasive species and plant materials.
- Prevent the introduction of deleterious substances into the waterbody (Section 6.2.4, and 6.2.8)
- Preserve any essential habitat features such as basking rocks and logs in shallower waters.

In addition to the general mitigations provided above for vegetation management, a small occurrence of common spike-rush (*Eleocharis palustris*) is suspected of occurring at the McNeil Lake Dam site. Common spike-rush wetlands are a Blue listed ecological community in BC.

- Where work necessitates digging in this area, it is recommended vegetation and soils be carefully placed on tarps so that the perennial plants can be transplanted back in place following the work.
- Plants should be kept cool and moist to remain viable for transplanting.

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## 6.2.6 INVASIVE PLANT MANAGEMENT

Introduction and proliferation of invasive plant species will be managed following measures provided below:

- Identify and flag locations of invasive plant species for avoidance during construction. Where feasible, construction should avoid areas where known or previous occurrences of invasive plants are recorded. The Contractor(s) will be required to establish a flagging convention and ensure all workers on-site understand the flagging colour for invasive plants and understand that these areas should be avoided.
- Limit disturbance of invasive plants where possible.



- All machinery, equipment, and vehicles arriving on site should be free of invasive plants, including plant parts and soil, prior to arriving on site and should be cleaned prior to leaving the Site.
- Inspect clothing and vehicle/equipment undercarriages for plant parts or propagules (i.e., seed heads, flowers) if working in an area known to contain invasive plants and document inspections.
- Limit soil disturbance to only those areas required for Project construction. Cover any exposed soil stockpiles with a tarp or geotextile to reduce invasive plant proliferation.
- Re-vegetate disturbed soils as soon as practical following disturbance with regionally appropriate, non-invasive, non-persistent seed mixtures or plants and use native species when possible
- Invasive plant species that are removed will be properly disposed of to prevent further invasion of naturally vegetated areas and to increase the chance of survival of future plantings.
- Material containing invasive plants should not be stored or piled at or near the site and should be disposed of at an acceptable licensed disposal facility located off-site, using applicable BMPs.

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### 6.2.7 WILDFIRE PREVENTION AND RESPONSE

Under the BC *Wildfire Act*, a person who carries out an activity defined under the Act as “high risk” on or within 300 m of forest land or grass land between March 1 and November 1, unless the area is snow covered must determine the Fire Danger Class for the location of the activity. High risk activities include but are not limited to: Mechanical brush clearing and Operating power saws, grinders, or other fire or spark producing tools.

Under the Act, there are three steps to determine the restrictions associated with proposed high-risk activities:

- 1 Determine whether the proposed activities are considered “High Risk” as defined by the act.
- 2 Determine the fire danger rating at the location of the proposed work.
- 3 Based on the fire danger rating, determine whether there are restrictions on the proposed activities.

The follow mitigation measures are provided to aid in preventing wildfires:

- Avoid parking on vegetation;
- Smoke only in designated areas with a fire-proof receptacle available for disposal of butts. Remove receptacle from the Project area at the end of each day;
- Small engines must have spark arrestors;
- Maintain fire extinguishers with each piece of equipment. Inform all personnel of the location of fire extinguishers at the Project location;
- Ensure personnel are trained in the use of fire extinguishers;
- Fuel tanks should be stored at a sufficient distance from vegetation to minimize the risk of creating a secondary fire risk; and
- Determine whether the proposed work is considered a High-Risk activity under the BC *Wildfire Act*.
  - Implement all restrictions appropriate to the High-Risk activity (see section 6.2.7 for determining restrictions).

**Wildfires must be reported to the BC Wildfire Service as soon as it is safe to do so. Report wildfires to: 1-800-663-5555 or \*5555 on most cellular networks.**

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## 6.2.8 SPILL PREVENTION AND EMERGENCY RESPONSE PROCEDURES

The release of deleterious substances, such as contaminated wash water, diesel fuel and petroleum-based lubricants, can impact soil and water quality, aquatic birds, mammals, and fish as well as vegetation and other wildlife found in the Project area. The following spill prevention and emergency response measures will be implemented, where appropriate, throughout the Project:

- Prior to the commencement of construction activities, the Spill Response Procedures in Appendix B will be reviewed and updated (as required), including the names and telephone numbers of persons and organizations that may be contacted in the event of an environmental incident. The Spill Response Procedures will be made available at the worksite and will be posted in a location that is visible and accessible nearby the emergency response equipment in the event of an environmental incident.
- A release of a deleterious substance that enters or is likely to enter any watercourse or waterbody, and spills exceeding thresholds specified in the Spill Reporting Regulation must be reported to Environmental Management BC (1-800-663-3456). Immediately report all spills of deleterious substances, no matter how small, to the EM and to the Contractor's Site Supervisor.
- All equipment (excavators and trucks) and machinery (pumps) should be in good operating condition and free of leaks or excess oil and grease. If necessary, power-wash equipment prior to entering the site.
- Equipment should be inspected by the Contractor(s) prior to start up at the beginning of each day and any leaks identified should be dealt with immediately.
- A spill containment kit shall be readily accessible onsite in the event of an accidental release of a deleterious substance to the environment. Ensure all construction personnel are sufficiently trained in the location and use of spill prevention equipment. Any used spill clean-up materials should be replaced immediately, and an inventory of materials should be maintained throughout the duration of work activities within the Project Area.
- Equipment containing ethylene glycol (antifreeze), or other water-soluble chemicals will carry an appropriate number of water-soluble chemical absorbent pads in addition to absorbent pads used for petroleum products.
- Spills occurring on dry land will be contained, scraped, and stored for disposal upon project completion. Contaminated material will be stored on polyurethane tarps and covered to prevent mobilization and will be disposed of in accordance with the regulations outlined in the *BC Environmental Management Act* (Government of BC, 2003a) and *Spill Reporting Regulation* (Government of BC, 2017).
- A designated refuelling and maintenance area should be established at the Sites. Effective communication protocol should be followed to prevent accidental release or overfilling of the equipment, and equipment should not be left unattended during refuelling. This site shall be located at least 30 m from the any watercourse or waterbody.
- Any stationary equipment such as pumps or generators should have their own containment capable of holding 150% of the equipment's fluids, and mobile equipment parked for more than 24 hours should have drip trays placed beneath the equipment.
- Fuels and chemical products stored on site should be kept in a secure container and in a manner that prevents leaks, drips, and spills (i.e., containers standing upright with caps on tight).
- No bulk storage of fuel, oils, or other flammable and combustible products should occur on-site.

- Plastic containers used to carry petroleum products should be designed for that purpose, be leak free, sealed with a proper fitting cap or lid, be labelled, and should not be more than five years of age per the *Transportation of Dangerous Goods Act* (TDGA) (GOC, 1992) and *Transportation of Dangerous Goods Regulations* (GOC, 2001).
- Transportation of hydrocarbons to, and within, the construction areas should be in conformance with the requirements of the TDGA.
- Containers greater than 23 litres (L, 5 gallons), including 205 L (45 gallon) drums, should be transported upright, and secured to prevent shifting and toppling.
- Used oil, filters, and grease cartridge lubrication containers and other products of equipment maintenance should be collected and kept in a secure receptacle for later disposal.
- No ignition sources should be permitted within the fuelling area.
- The Contractor(s) will maintain a list of Safety Data Sheets (SDS) for all materials used by the Contractor in performing the construction activities and for materials that potentially could be spilled or found on the Site.
- To limit the likelihood of a concrete release, the cleaning of concrete trucks shall not occur on the worksite.

#### 6.2.8.1 SPILL RESPONSE GUIDELINES

In the event of any release of fuel, lubricant, sludge, or other industrial chemical (including gases), the Contractor must immediately suspend activities, and implement the Emergency Spill Response Procedure in Appendix B. Additionally:

- The Contractor shall immediately notify the SCRD and the EM. If the environmental emergency is a reportable spill in quantities equal to or greater than those listed in the Spill Reporting Regulations under the BC *Environmental Management Act*, the Contractor shall immediately notify the EMBC, DFO, and Environment Canada (Appendix B).
- The Contractor shall submit written incident reports to the SCRD within 24 hours of any environmental incident or spill/release. The incident report shall identify the reporting organization, date, time, location, hazardous materials involved, source and persons or organizations notified. In addition, the report shall describe how the spill or release occurred, remedial action taken or planned, and actions necessary to prevent recurrence.
- The Contractor will be responsible for ensuring personnel are competent to adequately respond to a spill.

#### 6.2.8.2 SPILL REPORTING

All spills, regardless of volume, and other environmental incidents, must be reported to the SCRD and the EM. In addition to reporting internally to the SCRD and the EM, the Contractor is responsible for ensuring personnel know when to notify regulatory agencies. Incidents where reporting to regulatory agencies is required are shown in the Spill Response Plan in Appendix B.

It is the responsibility of the Contractor and the SCRD to report spills in excess of the quantities included in Appendix B to the appropriate environmental agency. It is the responsibility of SCRD to report applicable spills and other environmental incidents internally.

**\*\*\*ALL SPILLS TO WATER ARE REPORTABLE\*\*\***

**\*\*\*ALL SPILLS TO STORM SEWER ARE REPORTABLE TO THE APPLICABLE MUNICIPALITY  
AND/OR REGIONAL DISTRICT\*\*\***

The Contractor will ensure their staff are aware of and/or appropriately trained on their responsibilities of the environmental incident reporting requirements.

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### 6.2.9 ARCHAEOLOGICAL AND HERITAGE RESOURCE MANAGEMENT

An archaeological site is a location where evidence of past human activity exists. Archaeological sites are the only physical evidence for 98% of the past history of BC. BC recognizes the importance of these sites and controls damaging activities by protecting them by law and requiring a permit to develop within site boundaries. Damaging an archaeological site without a permit is unlawful. Some examples of an archaeological site include stone carvings, remains of ancient houses and campsites, shell middens, culturally modified trees, and early trading posts. Items of interest that may be uncovered during construction activities include human bones, pithouses, stone tools and rock paintings (pictographs).

Archaeological sites (both recorded and unrecorded) are protected under the *Heritage Conservation Act* and must not be altered or damaged without a site alteration permit from the Archaeology Branch. In the event that archaeological material is encountered during construction activities, work must be halted immediately pending archaeological investigations. The Contractor should immediately inform the SCRD and the EM and the Archaeology Branch should be contacted for direction.

## 7 CLOSURE

We trust the information contained in this report is sufficient for your present needs. Should you have any additional questions regarding the Project please do not hesitate to contact Mark Visser (780-410-6856) or Michael Taylor (778) 836-2677.

## 8 REFERENCES

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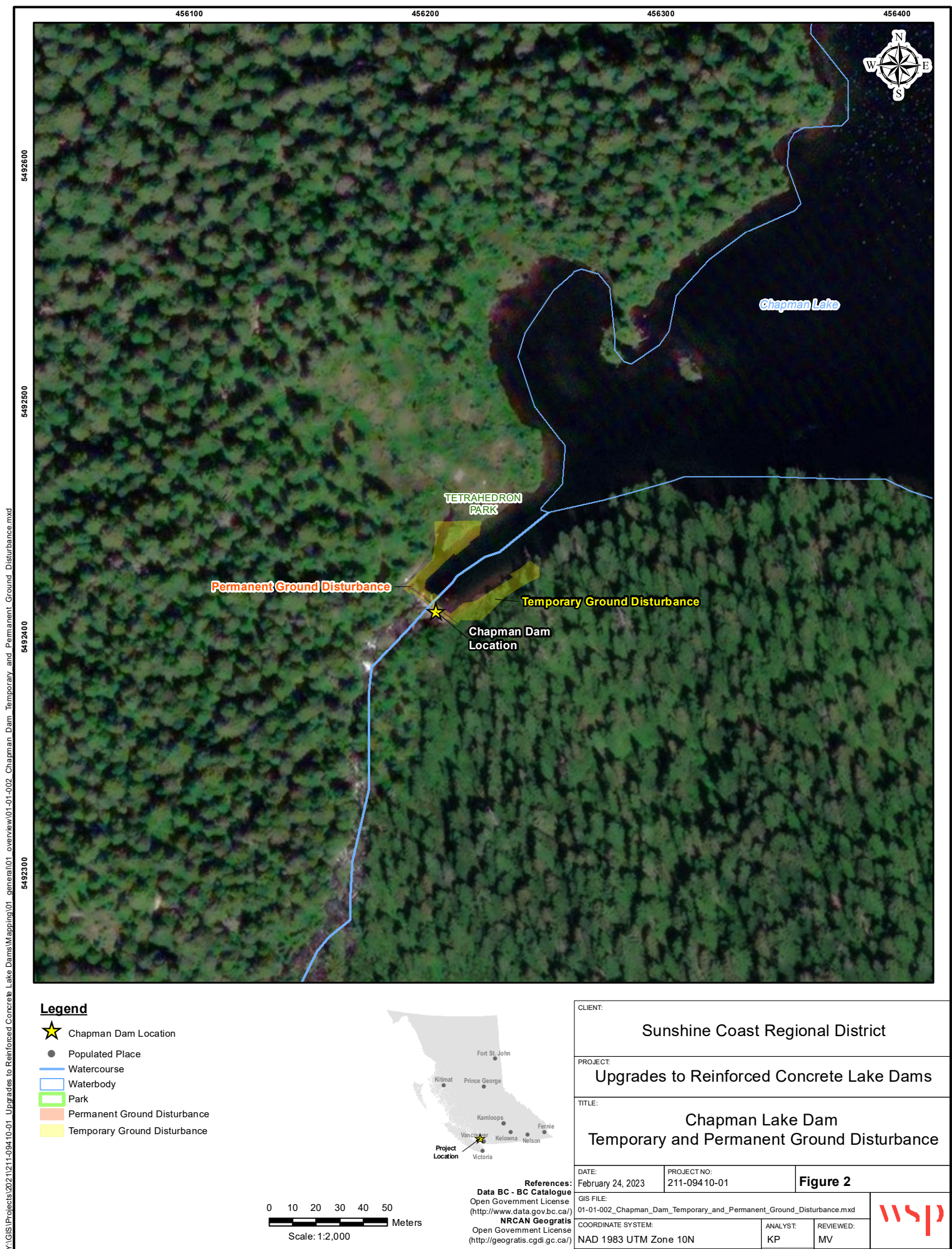
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# APPENDIX

## A SITE FIGURES









Y:\GIS\Projects\2021\211-09410-01\_ Upgrades to Reinforced Concrete Lake Dams\Mapping\01\_general\01\_overview\01-01-003\_Edwards\_Dam\_Temporary\_and\_Permanent\_Ground\_Disturbance.mxd




### Legend

- ★ Edwards Dam Location
- Populated Place
- Waterbody
- Temporary Ground Disturbance



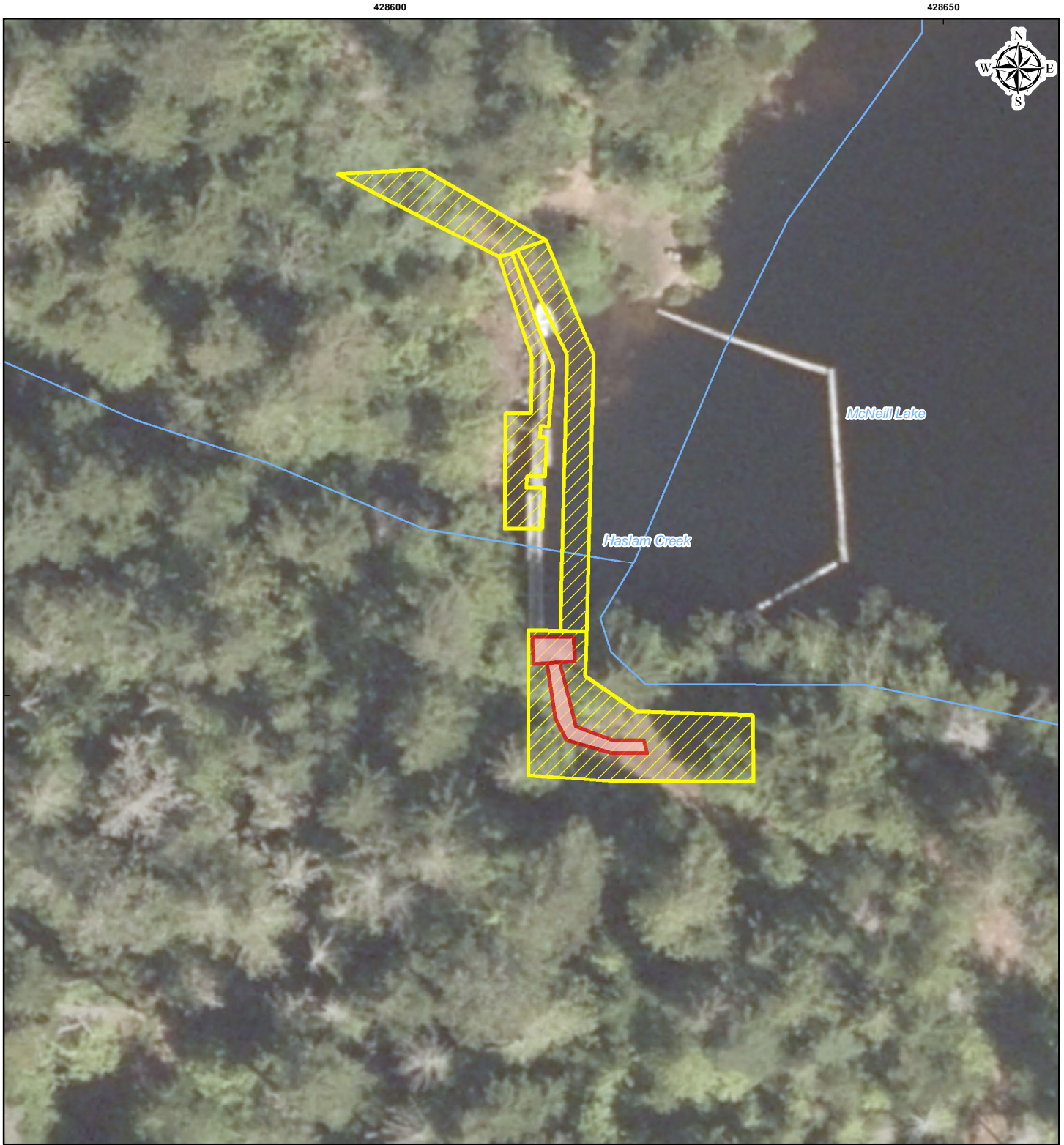
0 10 20 30 40 50  
Meters  
Scale: 1:2,000

**References:**  
Data BC - BC Catalogue  
Open Government License  
(<http://www.data.gov.bc.ca/>)  
**NRCAN Geogratis**  
Open Government License  
(<http://geogratis.gc.ca/>)

CLIENT: <b>Sunshine Coast Regional District</b>		
PROJECT: <b>Upgrades to Reinforced Concrete Lake Dams</b>		
TITLE: <b>Edwards Lake Dam Temporary and Permanent Ground Disturbance</b>		
DATE: February 24, 2023	PROJECT NO: 211-09410-01	<b>Figure 3</b>
GIS FILE: 01-01-003_Edwards_Dam_Temporary_and_Permanent_Ground_Disturbance.mxd		
COORDINATE SYSTEM: NAD 1983 UTM Zone 10N	ANALYST: KP	
	REVIEWED: MV	



Y:\GIS\Projects\2021\211-09410-00\_Lake\_Dams\Mapping\01\_general\01\_overview\01-01-015\_McNeil\_Dam\_Ground\_Disturbance.mxd



### Legend

- Watercourse
- Waterbody
- Temporary Ground Disturbance
- Permanent Ground Disturbance

0 10 20  
Meters  
Scale: 1:500



References:  
Data BC - BC Catalogue  
Open Government License  
(<http://www.data.gov.bc.ca/>)  
NRCAN Geogratis  
Open Government License  
(<http://geogratis.gc.ca/>)

CLIENT: Sunshine Coast Regional District			
PROJECT: Upgrades to Reinforced Concrete Lake Dams			
TITLE: McNeil Lake Dam Temporary and Permanent Ground Disturbance			
DATE: July 12, 2022	PROJECT NO: 211-09410-00	Figure 1	
GIS FILE: 01-01-015_McNeil_Dam_Ground_Disturbance.mxd		ANALYST: MY	REVIEWED: TG
COORDINATE SYSTEM: NAD 1983 UTM Zone 10N			

# APPENDIX

## **B** SPILL RESPONSE PLAN



# SPILL RESPONSE PLAN

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## 1.1 SPILL RESPONSE STEPS

In the event of spilled fuel, oils, lubricants or other harmful substances, the following procedure will be implemented.

### **Spill Response Steps**

- 1** Ensure Safety
- 2** Stop the Flow (if possible and SAFE to do so)
- 3** Secure the Area
- 4** Contain the Spill
- 5** Notify and Report to the Sunshine Coast Regional District and Environmental Monitor
- 6** Notify (EMBC 1-800-663-3456) see table below for reportable spill volumes and flow chart below for reporting method
- 7** Cleanup

Circumstances may dictate another sequence of events

- 1** Ensure Safety
  - Ensure personnel, public and environmental safety
  - Wear appropriate Personal Protective Equipment (PPE)
  - Never Rush in, always determine the product spilled before taking action, refer to MSDS when available
  - Warn people in the immediate vicinity
  - If spilled material is flammable, ensure no ignition sources are nearby
- 2** Stop the Flow (If possible and SAFE to do so)
  - Act quickly to reduce environmental impacts
  - Close valves, shut off pumps, plug or block holes or leaks, and set containers upright
  - Stop the flow of the spill at its source
- 3** Secure the Area
  - Limit access to the spill area
  - Prevent unauthorized entry onto site and spill area
- 4** Contain the Spill
  - Block off and protect any ditches and culverts in the vicinity of the spill
  - Prevent spilled material from entering any drainage structures (ditches, culverts, drains)
  - Use spill absorbent material to contain spill
  - If necessary, use a dike, berm, or any other method to prevent any discharge off-site
  - Make every effort to minimize contamination
  - Contain the spill as close to the source as possible
- 5** Notify and Report

- Notify the SCRD and EM of incident (Table 2)
- **When necessary**, the first external call should be made to **Emergency Management BC 1-800-663-3456** (see spill reporting requirements in Table 1)
- Provide necessary spill details to other external agencies

## 1.2 REPORTABLE SPILL QUANTITIES BY PRODUCT TYPE

If the spill occurs that exceeds the following quantities, it must be reported externally (EMBC and Environment Canada).

**Table 1 Reportable Spill Quantities by product**

SUBSTANCE	QUANTITY	EXTERNAL REPORTING REQUIREMENT	INTERNAL REPORTING REQUIREMENT
Any Spill	Any amount in aquatic habitat	EMBC, DFO and MoE	Environmental Incident Report (EIR)
Gasoline, Diesel, Oil and Waste Oil	>100 litres	EMBC	EIR
Oil with >50 ppm PCB	>25 Kg or litres	EMBC	EIR
Flammable or Non-Flammable Gas	10 kg	EMBC	EIR
Flammable Liquids	100 litres	EMBC	EIR
Toxic Gas or Corrosive	≥ 5 litres or kilograms	EMBC	EIR
Hazardous waste containing PAHs	>5 kg or litres	EMBC	EIR
Pesticides and Herbicides	5kg or litres	EMBC	EIR
Leachable Toxic Waste (e.g., antifreeze)	≥25 litres or kilograms	EMBC	EIR
A substance not covered by Items 1 to 23 of the Spill Reporting Regulation that can cause pollution	200 kilograms or 200 litres	EMBC	EIR

\* Quantities are subject to change. Refer to Regulations for latest figures

**\*\*\*ALL SPILLS TO WATER ARE REPORTABLE\*\*\***

**\*\*\*ALL SPILLS TO STORM SEWER ARE REPORTABLE TO THE APPLICABLE MUNICIPALITY AND/OR REGIONAL DISTRICT\*\*\***

## 1.3 SPILL KIT REQUIREMENTS

Spill kits and equipment, including absorbent pads, booms and leak-proof waste containers, will be provided by the Contractor(s) and be readily available on-site and on each piece of mobile equipment (e.g. Light trucks, excavators, backhoes, Bobcats, etc.) in the quantities required for the equipment being used and the quantities of fluids on-board. An equipment emergency spill kit should be kept fully stocked and include at a minimum:

- 50 Absorbent Pads (Oil, Gas & Diesel)

- 25 Universal Absorbent Pads (Antifreeze and Non-Hazardous)
- 6 – 3” x 4’ Absorbent Socks (Oil, Gas & Diesel)
- 4 – 3” x 8’ Absorbent Socks (Oil, Gas & Diesel)
- HD Hazmat Disposal Bags
- Minimum 10 pairs of Nitrile Gloves (sized for crew)
- 1 Spill Instruction Sheet

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## 1.4 EMERGENCY CONTACT LIST

Contact the following in the event of any Environmental Emergency

**Table 2 Emergency Contact List**

CONTACT	NAME	OFFICE PHONE	MOBILE PHONE
Engineer Lead	David Daw	604 278-1411	604-601-6765
SCRD Contact	Stephen Misiurak	604 885-6800 ex 6494	
Subcontractor Contact	TBD	TBD	TBD
WSP Environmental Contact	Mark Visser	780-410-6856	780-271-6602
Environmental Monitor	TBD		
Emergency Management BC (EMBC)	1-800-663-3456		
DFO Spill Reporting Line	1-800-465-4336		
Environment Canada Environmental Emergencies	1-604-666-6100		
RCMP/Fire/Emergency	911		

# SPILL RESPONSE FLOW CHART

