



REPORT

**Project No. 14031: Highway 11 North of Valley Road -
Northbound Flood Repairs**

2023 Construction Environmental Management Plan

Submitted to:

BC Ministry of Transportation and Infrastructure

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Distribution List

One electronic copy to MOTI

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BC Ministry of Environment and Climate Change Strategy, Fact Sheet 03 - Facts on the Management of Environmental Emergencies

1.0 INTRODUCTION

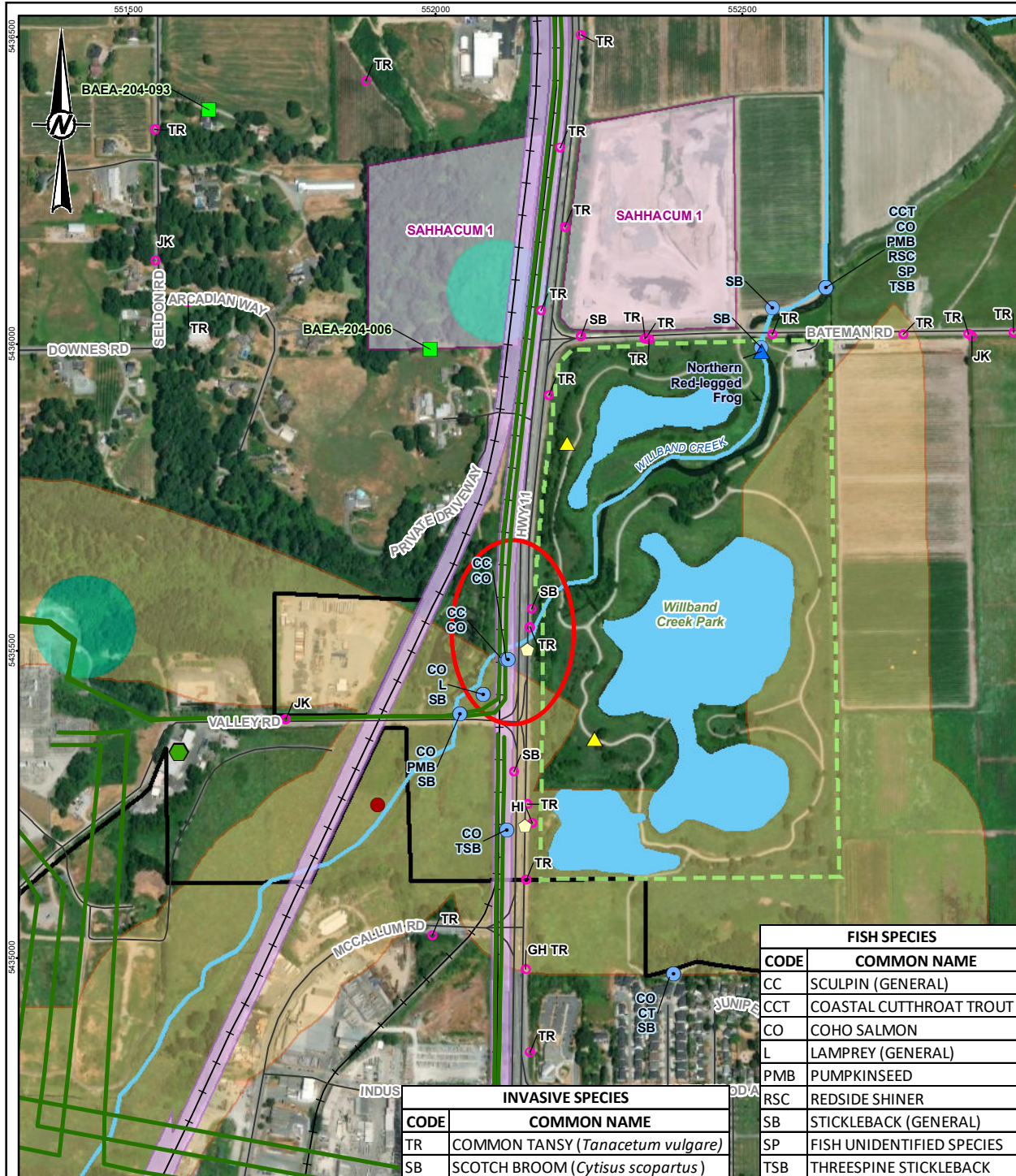
1.1 Overview

This Construction Environmental Management Plan (CEMP) is intended to provide Environmental Specifications for the Highway 11 Reinstatement project (The Project) for repairs to the northbound traffic lane between Valley and Bateman Road in Abbotsford, BC (Figure 1). The purpose of the Project will be to repair damages to Highway 11 sustained during the flooding event that occurred in November 2021. The repair location is directly adjacent to Willband Creek (WSC: 100-054300-56400), which is conveyed under the highway through an existing culvert.

The contents of this CEMP are organized as follows:

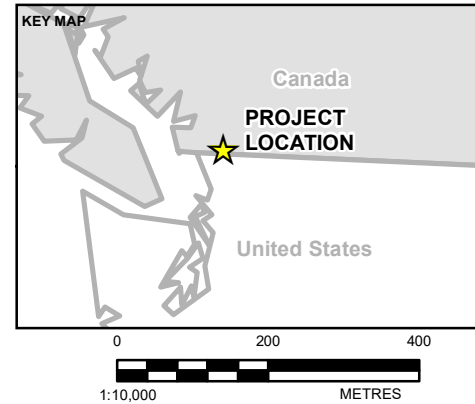
- **Section 1.0: Introduction** – Provides overview of the Project and the purpose and organization of the CEMP.
- **Section 2.0: Environmental Setting** – Provides summary of the physical, biological, and social/cultural setting of the Project area.
- **Section 3.0: Regulatory Setting** – Summarizes the environmental regulatory framework on which the development of this CEMP and corresponding mitigation measures have been based.
- **Section 4.0: Roles, Responsibilities, and Communication** – Describes roles, responsibilities, and reporting relationships of the contracting authority, the Environmental Monitor (EM), and the Contractor(s) as they relate to implementation of environmental management and mitigation measures.
- **Section 5.0: Environmental Management Activities and Controls** – Summarizes measures that will be undertaken for protection of environmental resources and environmental site inspection and monitoring activities that will be undertaken to assess and document that environmental management goals set for the Project are being met.
- **Section 6.0: Environmental Incidents** – Defines environmental incidents and outlines the reporting and notification protocol the contracting authority and relevant regulatory agencies.

The overall objective of this CEMP is to provide a framework for the management of potential environmental effects during the northbound highway repair works through the implementation of environmental protection measures (**Section 5.0**). The CEMP proposes environmental protection measures based on information collected during the preliminary environmental assessment (Golder 2022), relevant environmental regulatory requirements, industry standards, and best management practices for environmental protection. The Contractor is expected to retain a Qualified Professional (as described in **Section 4.0**) and will be responsible for the creation of a more detailed site-specific Environmental Protection Plan (EPP). This CEMP was developed in accordance with the 2020 *Standard Specifications for Highway Construction* (MOTI 2020), and outlines measures that are consistent with accepted best practices to avoid and reduce potential negative effects from the Project to the environment.



LEGEND

- BALD EAGLE NEST
- ▲ BLUE LISTED SPECIES AT RISK
- ⬠ CULVERT
- ⬡ ENVIRONMENTAL REMEDIATION SITE
- FISH OBSERVATION
- INVASIVE SPECIES (GREEN FROG [*Rana clamitans*])
- ▲ STICK NEST (FIELD OBSERVATION)
- BC HYDRO TRANSMISSION LINE
- ROAD
- RAILROAD
- WATERCOURSE
- ALR BOUNDARY
- CP RAIL ROW
- CRITICAL OREGON FOREST SNAIL HABITAT
- CRITICAL WESTERN PAINTED TURTLE HABITAT
- FIRST NATION RESERVE
- INVASIVE PLANT INSIDE STUDY AREA
- PARK
- STUDY AREA
- WETLAND



REFERENCE(S)

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CLIENT

MINISTRY OF TRANSPORTATION AND INFRASTRUCTURE

PROJECT

PROJECT NO. 14031: HIGHWAY 11 NORTH OF VALLEY ROAD – NORTHBOUND FLOOD REPAIRS

TITLE

PROJECT OVERVIEW

CONSULTANT



YYYY-MM-DD 2023-04-20

DESIGNED MR

PREPARED SP/JP

REVIEWED TS

APPROVED SR

PROJECT NO. 22517461

CONTROL 4000

REV. 0

FIGURE 1

INVASIVE SPECIES	
CODE	COMMON NAME
TR	COMMON TANSY (<i>Tanacetum vulgare</i>)
SB	SCOTCH BROOM (<i>Cytisus scopartus</i>)

FISH SPECIES	
CODE	COMMON NAME
CC	SCULPIN (GENERAL)
CCT	COASTAL CUTTHROAT TROUT
CO	COHO SALMON
L	LAMPREY (GENERAL)
PMB	PUMPKINSEED
RSC	REDSIDE SHINER
SB	STICKLEBACK (GENERAL)
SP	FISH UNIDENTIFIED SPECIES
TSB	THREESPIKE STICKLEBACK

25mm IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET HAS BEEN MODIFIED FROM ANSIA

1.2 Project Background and Description

Floodwaters inundated portions of Abbotsford, BC, in November 2021. Existing expanded polystyrene (EPS) has elevated from flood waters in sections along Highway 11 from Bateman Road to Valley Road, resulting in pavement lifting and cracking (Photo 1). Emergency short-term repair concluded in December 2021 and involved infill of the northbound and southbound distressed sections with Tephralite vesicular basalt lightweight fill (referred to as red pumice). In the spring of 2021, intermediate temporary repair works were conducted; EPS blocks were removed from the heavily distressed area of the northbound lane, replaced with red pumice fill, and the asphalt pavement structures were reinstated.

In August 2022, permanent repair works were completed for the southbound shoulder and comprised isolation of the work area along the edge of Willband Creek, removal of EPS blocks and fill material, and reinstatement of the southbound lane. Permanent repairs to the moderately distressed section of the northbound lane were scheduled for completion for summer of 2023.



Photo 1: Southward view toward Valley Road of the distressed zones of Highway 11, March 2022 (WSP 2022a).

2023 Update: Permanent repair works to the severely and moderately distressed areas of the northbound lanes are currently planned to be completed between 1 July and 30 September 2023 (Photo 2). Permanent repair to the northbound lanes will not require instream work. The general construction sequencing for permanent repairs of the northbound lanes is described below and could be subject to change pending design and scheduled works:

- Implementing erosion and sediment control (ESC) measures.
- Stripping the existing surficial asphalt.
- Removing EPS blocks from below the existing road surface (approximately 3 m depth).
- Replacing EPS with red pumice.
- Cutter Soil Cement Mixing (CSCM) within ground underneath the roadway.
- Reinstating pavement structure with sand and gravel, geogrid, geotextiles, and asphalt.
- Removing Project erosion and sediment control measures and installing post-construction erosion measures if required.
- Site clean up and restoration, including the application of hydroseed on the disturbed highway shoulders.

CSCM is a specialized deep-soil mechanical mixing technique for ground improvement. Mounted to the end of a Kelly Bar, two sets of counter rotating, vertically mounted cutter wheels cut down into the soil to a specified depth. For the northbound repair works, the cutters will descend to 20 m where the mixing tool will slowly be extracted while a cement slurry is continuously added, creating a soil-cement mixture which then sets to create panels of improved soil. The product result is sub-surface soil-cement panels approximately 2.5 meters in width and built in an interlocking grid pattern over an approximate ground improvement area of 90 m by 11 m.



Photo 2: Southward view toward Valley Road of the moderately distressed northbound of Highway 11, January 2023.

2.0 ENVIRONMENTAL SETTING

A preliminary environmental assessment was conducted by Golder (now known as WSP Canada Inc.) that included a desktop review of publicly available environmental data supplemented by a field survey of the Project area on 17 January 2022 (Golder 2022). In advance of the 2023 northbound lane repairs, WSP qualified environmental professionals (QEP) completed an on-site investigation on 21 March 2023 to determine environmental constraints in relation to the works planned during this phase of repairs.

The Project area is located along the Abbotsford-Mission Highway 11 immediately east of the intersection with Valley Road within the City of Abbotsford in the Fraser Valley Regional District. The Project area comprises a four-lane highway with two northbound and two southbound lanes. Canadian Pacific Railway right of way (ROW) is to the west of the highway, and a BC Hydro ROW is situated between the east of the highway and Willband Creek. The distressed section of the northbound lane extends for approximately 90 m.

Willband Creek Park is an urban wetland park that abuts the east side of the highway adjacent to the northbound lane. A line of trees (western red cedar [*Thuja plicata*], black cottonwood [*Populus trichocarpa*], fir sp. [*Pinaceae* sp.]) runs along the western boundary of the park and Highway 11. Willband Creek (1:50,000 WSC: 100-054300-53400) is a 3rd order stream and flows through a culvert under Highway 11 immediately south of the distressed area. Sixteen fish species have been recorded in Willband Creek (Table 1; BC MENV 2022). Anadromous salmonids observed in Willband Creek within 1 km of Highway 11 include Coho Salmon (*Oncorhynchus kisutch*) and Coastal Cutthroat Trout (*O. clarkii*). Other species include Pumpkinseed (*Lepomis gibbosus*), Redside shiner (*Richardsonius balteatus*), threespine stickleback (*Gasterosteus aculeatus*), Lamprey (*Lampetra* sp.), Sculpin (*Cottus* sp.), and stickleback (*Gasterosteus* sp.; Golder 2022).

The Northern Red-legged Frog [*Rana aurora*; Special Concern on Schedule 1 of Species at Risk Act (SARA) and provincially blue-listed] has been observed within Willband Creek approximately 327 m east of the intersection of Highway 11 and Bateman Rd (Figure 1; BC CDC 2021). There are no documented ecological communities at risk in the Project area (BC CDC 2021). A bald eagle nest (ID: BAEA-204-006; *Haliaeetus leucocephalus*) is located 167 m west of the intersection of Highway 11 and Bateman Rd (Figure 1; WiTS 2022).

One invasive wildlife species was identified within Willband Creek approximately 120 m south of Valley Road; Green Frog (*Rana clamitans*; Government of BC 2022a; Golder 2022; Figure 1). Green frogs are known to displace Oregon spotted frog (*Rana pretiosa*), an endangered species in BC with the potential to occur in the Project area, though no observations have been recorded (COSEWIC 2011). Two noxious weeds or invasive plant observations, common tansy (*Tanacetum vulgare*) and scotch broom (*Cytisus scoparius*), were recorded within the Project area (Government of BC 2022b).

3.0 REGULATORY SETTING

The federal and provincial environmental legislation and municipal bylaws summarized in Table 1 provide the framework for the procedures described in Section 5.0 of this EMP. This section is not necessarily exhaustive or all inclusive; it is the Contractor's responsibility to understand the regulatory context governing their activities and to act accordingly. Should clarification of any environmental issue be required, the Contractor should consult the original regulation or legislative document.

The Contractor(s) will be provided with copies of any authorizations, permits or approvals received by MOTI and will be responsible for complying with the terms and conditions specified within these documents as well as the provisions of the statutes under which the approvals have been issued. The Contractor(s) will be required to apply for any permits that have not been obtained by MOTI and are required for the project. The Contractor(s) will be required to keep copies of all Project approvals, authorizations, and permits on the Project site available for inspection as needed. It is understood that no instream works are to occur during Project activities. If, however, instream works are anticipated; applicable permitting will be required before commencing works.

At this time, and based on early design information, no environmental approvals would be required, as current construction footprint does not extend beyond the highway right of way or otherwise require activities in Willband Creek. If there are modifications to the design that result in the need for approvals, this CEMP will be updated.

Table 1: Relevant Federal and Provincial Environmental Legislation and Municipal Bylaws

Act, Regulation or Bylaw	Description	Applicability to the Project	Approval/Permit OR Requirements Met
Federal			
<i>Fisheries Act</i>	Section 34.4 prohibits any work, undertaking or activity, other than fishing, that results in the death of fish with several exceptions.	Project involves work adjacent to a watercourse and may have the potential to cause death of fish.	With mitigation, the Project is not anticipated to cause death of fish.
	Section 36(3) prohibits the deposit of a deleterious substance into water frequented by fish or to any place, under any conditions, where it may enter water frequented by fish.	Construction activities could result in a release of deleterious substances into water frequented by fish.	With mitigation, the Project is not anticipated to result in a release of deleterious substances into water frequented by fish.
	Section 38 includes a duty to notify and take corrective action for death of fish; harmful alteration, disruption or destruction of fish habitat; or deposit of a deleterious substance.	Project does not involve work in and around fish habitat with works occurring behind top of bank.	With mitigation, the Project is not anticipated to result in the death of fish, harmful alteration, disruption or destruction of fish habitat; or deposit of a deleterious substance occurs. If occurred, Fisheries and Oceans Canada (DFO) must be notified, and corrective action taken.

Table 1: Relevant Federal and Provincial Environmental Legislation and Municipal Bylaws

Act, Regulation or Bylaw	Description	Applicability to the Project	Approval/Permit OR Requirements Met
<i>Migratory Birds Convention Act</i>	Section 5.1(1) and 5.1(2) prohibits the deposit of a substance that is harmful to migratory birds.	Migratory birds may occur in the Project area, and deposition of a substance such as fuel may harm migratory birds.	Mitigation measures will be implemented to avoid depositing harmful substances.
<i>Transportation of Dangerous Goods Act, 1992</i>	Regulates the transport of dangerous goods in Canada, whether by rail, road, air, or water, and establishes safety standards and documentation to be complied with such that all containers, packages, and means of transport are clearly marked with prescribed safety marks. The Act also establishes requirements regarding emergency response assistance plans.	Dangerous goods may be transported during this Project.	Hazardous materials associated with the Project will be transported in accordance with this Act.
<i>Canadian Environmental Protection Act</i>	Addresses "cradle-to-grave" management of persistent toxic substances and requires assessment of new substances prior to their introduction into Canada, placing the onus on manufacturers and importers of chemical compounds to prove their safety to human health and the environment.	The highway reinstatement works may involve the use of toxic substances (e.g., cement for the cutter soil mixing and filling test holes).	Toxic substances associated with the Project will be handled in accordance with this Act.
<i>Species at Risk Act (SARA)</i>	Section 32 (1): No person shall kill, harm, harass, capture, or take an individual of a wildlife species that is listed as an extirpated species, an endangered species, or a threatened species.	Project involves work near critical habitat and may have the potential to encounter a SARA-listed species.	With mitigation, the Project is not anticipated to kill, harm, harass, capture, or remove a SARA-listed species.
	Section 33: No person shall damage or destroy the residence of one or more individuals of a wildlife species that is listed as an endangered species or a threatened species, or that is listed as an extirpated species if a recovery strategy has recommended the reintroduction of the species into the wild in Canada	Project involves work near critical habitat and may have the potential to encounter a SARA-listed species.	With mitigation, the Project is not anticipated damage or destroy the residence of a SARA-listed species.
Provincial			
<i>Water Sustainability Act</i> Section 11 Changes in and about a stream	Section 11 of the Water Sustainability Act prohibits making changes in and about a stream, unless authorized to do so (such as by a license, change approval, or the regulations).	Project work does not involve work within a watercourse.	Works will be conducted within the confines of the paved sections of Highway 11 and the gravel shoulder. The riparian area will not be disturbed. Permitting under the WSA is not anticipated.
<i>Environmental Management Act (EMA) Hazardous Waste Regulation</i>	This regulation addresses the proper handling and disposal of hazardous wastes, under the EMA. Hazardous wastes are wastes that could harm human health or the environment if not properly handled and disposed of. The Hazardous Waste Regulation includes the identification, handling, transport, disposal and treatment of hazardous wastes.	Hazardous wastes may be generated during this Project.	Mitigation measures will be implemented to avoid improper handling of hazardous waste.

Table 1: Relevant Federal and Provincial Environmental Legislation and Municipal Bylaws

Act, Regulation or Bylaw	Description	Applicability to the Project	Approval/Permit OR Requirements Met
<i>Environmental Management Act</i> Spill Reporting Regulation	This regulation defines a “spill” as an unauthorized release or discharge of a listed substance into the environment in an amount exceeding the listed quantity and specifies reporting. The regulation also identifies to whom spills are to be reported. If a spill occurs or is at imminent risk of occurring, a responsible person must ensure that the actual or potential spill is immediately reported to the Environmental Emergency Program (EEP) by calling 1-800- 663-3456 .	Listed substances might be used during the Project. EEP is the designated 24-hr emergency telephone service for notification.	Spill reporting requirements are to be considered in the development of a spill response plan.
<i>Wildlife Act</i>	Protects wildlife and wildlife habitat, specifically by requiring permits for certain circumstances, protecting raptors, owls and herons and their nests, and protecting birds, eggs, and nests during nesting periods.	Project involves work near wildlife habitat	With mitigation, the Project is not anticipated to interact with wildlife or wildlife habitat
<i>Heritage Conservation Act</i>	Encourages and facilitates the protection and conservation of heritage sites in British Columbia.	Archaeological materials and features may be present within the project footprint. An archaeological impact assessment (AIA) was conducted by WSP E&I along the northbound lane prior to 2023 construction works.	Chance-find procedures outlined in SS165.20 will be implemented if suspected cultural materials are identified. Necessary permitting or mitigation measures will be determined based on the findings of the AIA.
<i>Weed Control Act and Weed Control Regulation</i>	Requires landowner to control, in accordance with regulations, noxious weeds growing or located on land, premises or property occupied by the landowner. Noxious weeds are defined as plant species listed on Part 1 (Provincial Weeds) of Schedule A of the Weed Control Regulation	Project area may contain noxious weeds.	Mitigation measures will be implemented to avoid interaction with noxious weeds.
Municipal			
Erosion and Sediment Control Bylaw 1989 – 2010	No person shall discharge, or cause, suffer, or permit another person to discharge Sediment or Sediment Laden Water, either directly or indirectly into the Drainage System.	Project involves works nearby a watercourse with the potential for migrating surface flows atop highway 11.	Mitigation measures will be implemented to avoid turbid waters from entering the drainage system; utilizing appropriate ESC measures.
Sound Regulation Bylaw 2687-2017	11 (a) A person must not at any time, in or adjacent to Residential Premises, make or cause Sound resulting from Construction, the Equivalent Sound Level of which exceeds 85 dBA on an Approved Sound Meter when measured at the point of reception or 15.2 m.	The Project may create noise that is unsuitable for nearby Residential Premises.	Mitigation measures will be implemented to avoid sound that disturbs the quiet, peace, rest or enjoyment of a person or the public.

3.1 Applicable Best Management Practices and Guidelines

The following outlines applicable best management practices and guidelines:

- DFO's Measures to Protect Fish and Fish Habitat (DFO 2019)
- Land Development Guidelines for the Protection of Aquatic Habitat (Chilibeck et al. 1993)
- A User's Guide for Changes In and About a Stream in British Columbia (Government of BC 2022c)
- Requirements and Best Management Practices for Making Changes In and About A Stream in British Columbia (Government of BC 2022d)
- Canadian Council of Ministers of the Environment (CCME) Canadian Environmental Quality Guidelines (2013)
- BC Summary of Water Quality Guidelines: Aquatic Life, Wildlife and Agriculture (Ministry of Environment and Climate Change Strategy [MOECCS] 2021)
- Develop with Care 2014: Environmental Guidelines for Urban and Rural Land Developments in British Columbia (BC MOE 2014)
- Guidelines for Raptor Conservation during Urban and Rural Land Development in British Columbia: A companion document to Develop with Care (BC MOE 2013)
- Environmental Best Practices for Highway Maintenance Activities (MOTI 2018)
- 2020 *Standard Specifications for Highway Construction* (Section 165 Protection of the Environment; MOTI 2020)

4.0 ROLES, RESPONSIBILITIES, AND COMMUNICATION

This section describes the roles and responsibilities of MOTI and the Prime Contractor for implementing, inspecting, and reporting on the effectiveness of the environmental mitigation measures. The team organization and communication structure is composed of the following:

The Owner

The MOTI is the owner and Project authority and is responsible for the overall compliance with federal and provincial legislation. The role of the Owner is to coordinate the overall Project including the detailed design, material procurement, etc. The responsibilities of the Owner include the following:

- Manage the Project's schedule and budget.
- Maintain effective communication links between the Contractor and Environmental Monitor.
- Document Contractor site-specific work plans for compliance with the CEMP and applicable regulatory permits and approvals.
- Document compliance with terms and conditions of regulatory permits and approvals as mandated under federal and provincial legislation.
- Documenting that copies of regulatory permit and approvals and required spill response procedures are always maintained and available on site.
- Manage and communicate with regulatory agencies, interested and potentially affected general public stakeholders, and Indigenous Peoples, as required.
- Review the Environmental Monitoring reports prepared by the Environmental Monitor.
- Assist in emergency situations or incidents to minimize adverse environmental effects.

The Prime Contractor

The Prime Contractor will implement construction plans and will facilitate the highway reinstatement works.

The Contractor

The Contractor will be responsible for the actions of its agents, employees, and subcontractors, and thus will undertake all reasonable actions to have environmental protection measures in place and working effectively throughout the Project area. The contractors will:

- Adhere to conditions or requirements prescribed by agencies or set out in any applicable regulatory authorizations, approvals and permits, and contract requirements, including this CEMP.
- Provide detailed environmental protection plans (i.e., Erosion and Sediment Control Plan, Concrete Waste Management Plan). Plans should be robust and include any and all environmental procedures not covered in detail by this CEMP.
- Undertake effective communication with work crews and subcontractors such that environmental responsibilities and requirements are understood prior to the commencement of work and are implemented during the work.
- Retain an Environmental Monitor (EM) with appropriate skills to monitor the performance of the contractor and any subcontractors against the requirements outlined in any regulatory approvals, authorizations, and permits, as well as environmental protection goals provided in this CEMP.

- Use equipment and implement work procedures and controls to prevent and/or reduce work-related disturbance to physical, biological, and social and cultural resources within or near the Project area.
- Take preventative and corrective measures in response to non-conformance with regulatory and contractual requirements, including this CEMP.
- Verify that emergency spill response materials are available on site for immediate use and appropriately stocked.
- Notify the EM of all spills of deleterious substances and other emergencies.
- Immediately respond to environmental incidents including leaks and spills (defined in Section 6.0).

Environmental Monitor

Environmental monitoring will be conducted by or under the supervision of a Qualified Professional (QP). For the purposes of this CEMP, a QP is defined as a person who is registered and/or licensed in the relevant jurisdiction with his or her appropriate professional association and/or licensing authority, acts under that professional association's and/or licensing authority's code of ethics, and is subject to disciplinary action by that professional association and/or licensing authority, and through suitable education, experience, accreditation, and knowledge can be reasonably relied on to provide advice within his or her area of expertise.

The EM will be present to facilitate and document compliance with the requirements of the *Standard Specifications for Highway Construction*; Section 165 – Protection of the Environment and will specifically meet requirements for an Environmental Monitor described in Section 165.02 (MOTI 2020). They are also responsible for facilitating and documenting compliance with relevant environmental legislation, terms and conditions of regulatory permits and approvals, and environmental contract requirements, including this CEMP. Environmental monitoring tasks will include participating in meetings, conducting work site inspections, and reporting. Inspections will be completed at a frequency as determined necessary by the EM.

In general, the responsibilities of the Environmental Monitor include the following:

- Attend pre-job and/or tailboard meetings and communicate environmental sensitivities and environmental requirements of the work to onsite crew including Contractor personnel.
- Assess whether all best management practices and mitigation measures are in place to avoid and minimize environmental impact on the land and on fish and fish habitat of Willband Creek.
- Where applicable, assist in the isolation of the site using applicable ESC measures for nearby or adjacent sensitive environmental receptors prior to the commencement of works.
- Report spills including detailed information such as time of day, staff involved, nature, cause, and degree of spill, recovery process deployed, and agencies notified.
- Evaluate daily effectiveness of the mitigation measures being applied.
- Prepare and submit periodic brief memorandums of implementation and effectiveness of mitigation measures, and corrective actions taken, to the Contractor and MOTI.
- Prepare and submit environmental incidents and non-compliance event memorandums with 24 hours of the event, to the Contractor and MOTI.
- Be granted authority to stop the work authorized under this order if deemed necessary to address risks to the environment. The Qualified Professional or their designate [specified in writing] must be on site during all phases of construction in and around the stream.

The Environmental Monitor has the authority to modify or halt any activity that is causing, or potentially causing, damage to terrestrial and aquatic resources or their habitats.

Responsibilities of the EM(s) will also include the following:

- Assess compliance with the environmental control strategies and mitigation measures specified in this CEMP, and with terms and conditions specified by applicable legislation, guidelines and best management practices.
- Provide recommendations to the contractors for installing, maintaining and/or improving control and mitigation measures, as necessary.
- Implement and assess whether erosion and sediment control measures are constructed, installed, and maintained appropriately for the full duration of Project works.
- Assess the effectiveness of the mitigation measures being applied.
- Communications with the Contractor to discuss current observations and noted deficiencies or successes, to follow up on action items, and to anticipate and coordinate construction sequencing and tasks with erosion and sediment control practices.
- Identify potential emerging environmental issues and provide advice to avoid and reduce potential for environmental incidents.
- Verify that emergency spill response materials are available on-site and appropriately stocked.
- Visually inspect mobile equipment for general condition and leaks.
- Watch for and identify wildlife and make crews aware of notable observations.
- Inspection of material stockpile sites and other possible sources of sedimentation.
- Liaison with regulatory agencies.

The EM will be on-site during all Cutter Soil Cement Mixing operations and will otherwise attend the site on a weekly basis to perform general compliance review of all the Contractor's environmental responsibilities and provide a report of the observations and findings within seven days of that review to the Contractor and the MOTI.

4.1 Meetings

Environmental requirements of the Project are to be reviewed by the Contractors and their crews at the start of the Project and during daily tailgate meetings. Environmental requirements will be addressed, as necessary based on the nature of the work being conducted, in daily tailgate meetings. These meetings will be used to review environmental requirements of the work and environmental precautions applicable to the work. The Contractors will keep a record of environmental requirements addressed in daily tailgate meetings and provide to MOTI and the prime contractor upon request.

In the event of an environmental incident, as described in Section 6.0, MOTI and the prime contractor will be notified immediately, and emergency reporting procedures will be followed, as described in Section 5.5.3.

5.0 ENVIRONMENTAL MANAGEMENT ACTIVITIES AND CONTROLS

5.1 Habitat Protection

5.1.1 Fish and Fish Habitat Protection

The following measures will be implemented to mitigate potential Project impacts to fish and fish habitat:

- An EM will be present to monitor water quality during the Cutter Soil Cement Mixing works.
- The Contractor will be required to design and implement a robust site-specific Erosion and Sediment Control Plan (ESCP) to be reviewed and approved by the MOTI prior to implementation. Erosion and sediment control measures outlined in the ESCP will be used to prevent sediment laden water from entering Willband Creek.
- Refueling and servicing of machinery will be done at a minimum of 30 m from Willband Creek.
- Spills of potentially deleterious materials should be cleaned up immediately. Should the volume released be unmanageable by the mitigation measures listed above, the contractor will coordinate for a hydrovac truck to attend site to assist with product recovery. During any spills, work will cease, and directions provided in Section 5.5 will be followed.
- Storm water runoff will be directed into vegetated areas to remove suspended solids, dissipate velocity and prevent sediment and other deleterious substances from entering Willband Creek. Erosion and sediment control measures will be used to prevent sediment laden water from entering Willband Creek.
- The riparian area along the northbound lane begins at the eastern boundary of the gravel shoulder. An EM will delineate the riparian zone with stakes as a no-disturbance zone and Environmentally Sensitive Area prior to construction activities.

5.1.2 Amphibian Protection

The following measures will be implemented to mitigate potential Project impacts to amphibians:

- An EM will be present and will monitor for movement of amphibian into the Project area.
- Erosion and sediment control measures that will be used on site (i.e., silt fences) will have a dual purpose of a frog fence to prevent the movement of amphibians into the work area. The EM will be required to ensure that the silt fences are properly keyed into the ground.
- No permits have been issued for amphibian collection. No amphibian salvage is anticipated, and the handling of amphibians is not permitted.

5.1.3 Wildlife Habitat Protection

The following measures will be implemented to mitigate potential Project impacts to wildlife and wildlife habitat:

- No vegetation brushing or tree felling is required.
- Existing roads or disturbed areas will be used to avoid disturbance to vegetated areas.
- Silt fencing used for erosion and sediment control will have a dual purpose of wildlife exclusion fencing. The EM will assess the silt fences, and if damaged the fences will be replaced as quickly as feasible.
- Machinery will arrive on-site in a clean condition and free of invasive plants and will be maintained free of fluid leaks. All spills and leaks, including minor drips from machinery or vehicles, should be reported to the EM as soon as practicable.

- Waste materials produced during the highway reinstatement works will be cleaned up immediately, collected, and transported off-site for disposal at a licensed disposal facility.
- The work site will be inspected at the end of each workday and waste materials collected to avoid unanticipated release(s) of deleterious materials into nearby aquatic or terrestrial habitats.

5.2 Erosion and Sediment Control (ESC)

The following measures will be implemented to mitigate potential Project impacts of erosion and sediment in a manner appropriate for the work activity:

- The Contractor will be required to design and implement a robust site-specific Erosion and Sediment Control Plan to be reviewed and approved by the MOTI prior to implementation.
- The Contractor will ensure that an EM is on-site during initial site preparation, mobilization, and demobilization to oversee implementation of environmental mitigation measures.
- Erosion and sediment control provisions implemented will be in accordance with measures provided in Land Development Guidelines for the Protection of Aquatic Habitat (Chilibeck et. al. 1993) and BMPs.
- Boundaries of works will be clearly delineated to limit the work areas to within the construction footprint. Encroaching on set boundaries may result in regulatory permit applications.
- Sediment (silt) fences, straw bales and/or other sediment control measures will be installed as required to reduce potential for soils or sediment-laden water to enter Willband Stream. Silt fences will follow the ground contour and will be properly keyed-in.
- Exposed soils will be covered by geotextiles, tarpaulins, or plastic, or re-vegetated to help prevent erosion.
- Erosion and sediment control requirements will be evaluated throughout Project construction and identified issues will be addressed as they arise.
- Based on field observations, corrective or preventative actions may be raised indicating that amendments are required to the ESC Plan.
- The Contractor will have the appropriate equipment to maintain site cleanliness and for reducing potential for soils or sediment laden water to be transported into Willband Creek (i.e., portable pumps, we-dry vacuum, etc.).
- Excess silts and soils associated with the highway reinstatement works will be removed from site. The work site will be cleaned of any remaining debris daily, and the debris will be disposed of as outlined in this CEMP.
- Potential suspension or limitation of work during heavy rainfall to prevent sediment-laden runoff adjacent watercourse and or storm water drainage. Heavy rainfall or a significant rainfall event is defined as any precipitation event which meets or exceeds the intensity of 25 mm/day.
- Erosion and sediment control measures will be inspected following significant rainfall events (SRE, defined as greater than 25 mm of rain within a 24-hour period) and conditions that lead to sustained winds of a Beaufort 9 (77-88 km/hr) or higher. Damaged sediment control measures will be replaced as quickly as feasible. If required (e.g., due to abnormally high water), sediment control measures will be added or adjusted to ensure they are working effectively and to ensure compliance with this CEMP and the ESC Plan.

- The Contractor will be responsible for the maintenance and any necessary changes to the erosion and sediment control measures to ensure they are working effectively and to ensure compliance with this EMP and the ESC Plan. All materials for effective erosion and sediment control will be supplied by the Contractor.
- If sediment or other potentially deleterious substance enters a watercourse, the Contractor will immediately take remedial steps to control and contain the release be responsible for making necessary modifications to its erosion and sediment control measures to ensure compliance with environmental requirements.

5.3 Water Quality Management

The following measures will be implemented to mitigate potential Project impacts to water quality in a manner appropriate for the work activity:

- Water quality will be monitored when there is a risk that the highway reinstatement works could adversely impact water quality parameters.
- The EM will monitor any turbidity plumes (visual and with a turbidity meter), hydrocarbon sheens (visual), and pH (with a handheld water quality meter) in Willband Creek at a suitable downstream location. Water quality will be monitored for compliance with the British Columbia Approved Water Quality Guidelines: Aquatic Life, Wildlife & Agriculture (MOECCS 2021).
- During water quality monitoring, baseline water quality measurements will be taken outside of the immediate work area, in an area unimpacted by the water quality disturbance, as determined appropriate by the EM. These measurements will be used to determine baseline levels for water quality parameters and will be used for comparison with water quality measurements collected during construction activities.

Table 2: British Columbia Approved Water Quality Guidelines: Aquatic Life, Wildlife & Agriculture

Parameter	Guideline
Turbidity	<ul style="list-style-type: none"> ■ Change from background of 8 NTU at any one time for a duration of 24 h in all waters during clear flows or in clear waters ■ Change from background of 2 NTU at any one time for a duration of 30 d in all waters during clear flows or in clear waters ■ Change from background of 5 NTU at any time when background is 8 - 50 NTU during high flows or in turbid waters ■ Change from background of 10% when background is > 50 NTU at any time during high flows or in turbid waters
Oil and Grease (hydrocarbon sheen)	The surface water should be virtually free of petroleum, animal, or vegetable oils.
pH	6.5 - 9.0 Unrestricted change permitted within this pH range. This component of the freshwater WQGs should be used cautiously if the pH changes cause the carbon dioxide concentrations to exceed a 10 µmol/L minimum or a 1,360 µmol/L short-term. Carbon dioxide concentrations below 10 µmol/L can cause a shift in the phytoplankton community to cyanobacteria, while CO ₂ concentrations above 1,360 µmol/L can be toxic to fish.

Source: MOECCS 2021

5.3.1 Water Supply and Use

The contractor will supply water directly to site, if required. No water will be removed from the surrounding watercourses and wetlands unless authorized through a use approval under Section 10 of the BC *Water Sustainability Act*.

5.4 Invasive Plant Management

To reduce potential for the spread of invasive plants at the site during project works, mitigation measures have been provided below. For the purposes of this project, invasive plants are plant species listed under the *Weed Control Act* (Government of BC 1996).

To mitigate the proliferation of invasive and non-native plant species the following mitigation measures will be adhered to:

- Prior to the start of construction, the Environmental Monitor will complete a confirmatory invasive plant survey to inform the Site-specific Invasive Plant Management Plan.
- Machinery and equipment will be checked before it arrives on-site to make sure it is clean (i.e., free of mud and plants) to avoid potential for introduction of invasive plant species.
- Inspect clothing and vehicle/equipment undercarriages for plant parts or propagules if working in an area known to contain invasive plants.
- Remove plant seeds or propagules from clothes and/or equipment and contain washing fluids (i.e., water or mud) on-site at designated cleaning stations.
- Re-vegetate any disturbed soils with a locally appropriate seed mix.
- Where required, use only clean soil or other fill material free of non-native plants or seeds.
- Educate staff and Contractor(s) to identify invasive plants that have the potential to establish at the site.
- The amount of soil disturbance will be minimized to only those areas required for Project access.
- If encountered, invasive plant material will be treated and/or properly disposed of to prevent further invasion of naturally vegetated areas. Material containing invasive plants should not be stored or piled at or near the Project Area and should be disposed of at an acceptable disposal facility located off-site, using best management practices.

5.5 Spill Prevention and Emergency Response

The release of deleterious substances, such as hydrocarbons, 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 or as requested by the QP.

5.5.1 Spill Prevention

- Prior to the commencement of Project activities, the Emergency Response Procedures must be identified by the Contractor including the names and telephone numbers of persons and organizations that may be contacted in the event of an environmental incident. The Emergency Response Procedures will be made available in the Project area and will be posted in a location that is visible and accessible nearby the emergency response equipment in the event of an environmental incident.
- All field personnel will be made aware of the location of Emergency Spill Response equipment and the procedures necessary to contain spills of any fluid.
- Vehicles and machinery will arrive on-site in a clean and washed condition and will be maintained such that they are free of fluid leaks. Equipment will be inspected by the Contractor prior to start up at the beginning of each day, and by the Environmental Monitor when on-site. Any leaks identified will be brought to the machine operators' attention and dealt with immediately. Daily visual inspections will include confirming that all personal protective equipment and other emergency response equipment are in place.
- Equipment used by construction crews will be maintained in good working order, without leaks or excess grease, including at lubrication points.
- At the end of each working day, construction equipment containing hydrocarbon fluids or grease will be moved and parked more than 30 m from any stream or other body of water. Spill containment / drip trays will be placed under equipment with the potential to release oils.
- Where on-site fueling or maintenance of vehicles and equipment is required, the following mitigation measures will be implemented:
 - Transportation of fuels will be conducted in accordance with Transportation of Dangerous Goods Regulations. Fuel storage and handling will comply with A Field Guide to Fuel Handling, Transportation and Storage (MWLAP 2002).
 - All fueling of equipment and vehicles must occur more than 30 m from Willband Creek.
 - Nozzles will be equipped with automatic shut offs, or a drip-free dispensing nozzle will be used.
 - A drip tray or pan will be used to collect excess fuel, oil, or other hazardous materials to avoid contamination of soils.
 - Vehicles will not be left running during refueling. Fire extinguishers and spill kits must be kept in the area of fuel storage and handling.
 - The Contractor's will have personnel stationed at both the fuel source and the equipment receiving the fuel during equipment refueling, and effective communication protocols shall be followed to prevent accidental release or overfilling of the equipment.

5.5.2 Spill Response

- Spill containment kits must be available on every piece of portable or heavy equipment and contain sufficient materials for addressing the anticipated maximum spill from a given piece of equipment. Equipment containing ethylene glycol (e.g., 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.
- Inspections will be completed by the EM at regular intervals throughout the Project to compare current contents of spill containment kits with required contents, whenever a spill kit is used, and whenever a new piece of equipment comes on-site.
- A fully stocked large spill containment kit must be present on-site at all times and be easily accessible.
- Spill containment kit contents shall be consistent with requirement outlined in Table 9.3 of A Field Guide to Fuel handling, Transportation and Storage (MWLAP 2002).
- Employees will be trained in the use of spill response equipment, including the location, type, and correct deployment of spill response equipment relating to the nature and location of work and potential for spills, and distinguishing between grey absorbent pads used for water soluble chemicals and white pads used for petroleum products.
- During site inspections, the EM will conduct visual inspections for hydrocarbon sheens. If observed, a work Stop Work order until the source of the hydrocarbon sheen can be identified. If it is determined that the Project is the source of the hydrocarbon sheen, then the Emergency Response Procedures, as described in Section 5.5.3 will be initiated.

5.5.3 Emergency Response Procedures

If an environmental incident occurs, including a spill of fuels, oils, lubricants or other harmful substances, the following procedures will be implemented, as described below:

- 1) **MAKE THE AREA SAFE**
- 2) **STOP THE FLOW/ENVIRONMENTAL EFFECTS (when possible and safe to do so)**
- 3) **REPORT THE SPILL**
- 4) **SECURE THE AREA**
- 5) **CONTAIN SPILLS**
- 6) **NOTIFICATION (EMBC 1-800-663-3456)**
- 7) **CLEAN-UP**
- 8) **INCIDENT REPORT**

1. MAKE THE AREA SAFE

- Evaluate risk to personnel/public and environmental safety.
- Wear appropriate Personal Protective Equipment.
- Never rush in, always determine the product spilled before taking action.
- Warn people in the immediate vicinity.
- Verify that no ignition sources are present if a spill of a flammable material has occurred.

2. STOP THE FLOW/ENVIRONMENTAL EFFECTS (when possible and safe to do so)

- Act quickly to reduce the risk of environmental effects.
- Close valves shut off pumps or plug holes/leaks.
- If a spill has occurred, stop the flow or the spill at its source.

3. REPORT THE SPILL

- Notify the Contractor Site Supervisor and the EM or alternate of incident (provide details).

4. SECURE THE AREA

- Limit access to the area of the environmental incident.
- Prevent unauthorized entry onto the Site.
- Assess the situation (type of spill, volume spilled, potential safety and environmental issues).
- If the spill is beyond your level of training and experience, seek assistance from a spill response specialist.

5. CONTAIN SPILLS

- Act within your ability using resources (hand tools, heavy equipment and spill response equipment) at hand to minimize the spread and impact of the spill until additional resources and expertise arrive.
- Due to the hazardous nature of gasoline, volatile gases shall be allowed to dissipate before attempts are made to contain or mop up a gasoline spill.
- Spills to Land
 - Determine extent of spill.
 - Contain spills away from watercourses.
 - Block off and protect drainage systems, e.g., drains, ditches, and culverts.
 - Mark the perimeter of the spill, dig recovery ditches around the perimeter and recovery pits (sumps) within the spill area.
 - Monitor ditches and recovery pits to ensure the collection system is effective.

- Recover the product from the containment area, treat or dispose of appropriately.
- Spill to Water
 - In a ditch or stream, contain the spill using whatever surface water containment system possible.
 - Divert and corral the spilled product to the containment system using absorbent booms or other methods.
 - Continue to sweep and corral the spilled product to one corner for recovery.
 - Collect water samples to characterize the nature and extent of release.
- For Spills < 25 L
 - Soak up all free products with absorbent pads, booms, and other materials
 - Place used absorbent materials in a heavy-duty plastic bag or other suitable container for disposal or recycling. Mix stained soil with loose absorbents or commercial bioremediation agents

6. NOTIFICATION

Within 24 hours of discovery, determine appropriate internal and regulatory notification obligations and notify appropriate personnel. Immediately notify the Contractor's EM to initiate reporting procedures and appropriate containment and recovery actions. **The first call shall be made to the Provincial Emergency Program (EEP) at 1-800-663-3456 (24 hour).** Subsequent reports would be made to the appropriate ministries/agencies, according to APPENDIX B; Prescribed Substances and Quantities for Immediate Spill Reporting to allow for immediate response. For spills to aquatic habitat, collection of water samples shall be undertaken to characterize the nature and extent of the release.

7. CLEAN-UP

- Determine cleanup options.
- Mobilize recovery equipment and cleanup crew and direct cleanup activities.
- Dispose of all equipment and/or material used in clean up (e.g., used sorbent, oil containment materials, etc.) in accordance with Ministry of Environment and Climate Change Strategy requirements. Disposal of hazardous wastes (e.g., material with > 3% oil by mass) and contaminated soil must comply with the *Environmental Management Act* and Regulations.
- Replenish spill response kits and equipment.

8. ENVIRONMENT INCIDENT REPORTING

Provide the required information about the incident to the EM, including mitigation to be put in place to avoid further incidents. The update to Minister/End-of-Spill Report form related to externally reportable spills is provided in Appendix A and the list of emergency contacts is summarized in Table 3.

Emergency Contact List

An emergency contact list will be posted in a visible and accessible location on the Project site. General emergency contact numbers are outlined in Table 3.

Table 3: Emergency Contact List

Organization	Contact Information
Environmental Emergency Program BC (EEP)	1-800-663-3456
Emergency Response Services	911
WorkSafeBC	1-888-621-7233 1-866-922-4357 (after hours)
MOTI Representative – Valerie Fabrick, Binnie	1-778-945-6071
Construction Manager – Mike Farynuk, WSP	mike.farynuk@wsp.com
Prime Contractor – To be determined	To be determined
Environmental Monitor – To be determined	To be determined

Emergency Response Equipment

Emergency response equipment to be available on-site will consist of the following:

- Fire Extinguisher
- First-aid Kit
- Spill Kit (Located in all vehicles and in portable containers, present in work areas)
- Portable Water Pump

At a minimum, spill kits will be maintained and fully stocked with materials suitable to respond to the volumes of hazardous substances located within the Project area. Spill kits are to be made available in suitable locations and stored within known, readily available containers.

5.5.4 Equipment Fueling and Maintenance

Requirements for equipment fueling and maintenance are as follows:

- Equipment will be inspected by the Contractor(s) prior to start up at the beginning of each day, and by the EM when on-site.
- Equipment used by construction crews will be maintained in good working order, without leaks or excess grease, including at lubrication points.
- Any leaks identified will be brought to the machine operators' attention and dealt with immediately.
- If fueling or maintenance of equipment and machinery is required, it will be completed within secondary containment.

- Service vehicles used for fueling will be equipped with automatic shut-off valves, where applicable.
- Valves will be in the closed position and locked and secured when not in use.
- Accidental release or overfilling of equipment will be prevented by careful observation and communication.
- No ignition sources will be permitted within the fueling area.
- A drip tray or pan will be used to collect excess fuel, oil, or other hazardous materials to avoid contamination of soils.
- Used oil, filters, and grease cartridge lubrication containers and other products of equipment maintenance will be collected and kept in a secure receptacle for appropriate disposal.
- All fueling of equipment and vehicles must occur more than 30 m from Willband Creek.

5.6 Materials Storage, Handling and Hazardous Waste Management

- Hazardous materials including “Dangerous Goods” (as defined under the *Transportation of Dangerous Goods Act*) and “Controlled Substances” (as defined under the Occupational Health & Safety Regulation) used during the highway reinstatement works shall be stored and handled to avoid loss and to allow containment and recovery in the event of a spill. The Prime Contractor shall be responsible for maintaining a daily inventory of all dangerous goods and controlled substances.
- Fuels, oils, or other flammable and combustible products stored at the job site will be placed within appropriate containers that are clearly labelled and controlled in accordance with the Workplace Hazardous Material Information System (WHMIS 2015), BC Fire Code (BC Fire Code 2018) and the Transportation of Dangerous Goods Regulations. These hazardous material containers will be regularly inspected for signs of leakage and inspections shall also be undertaken so that all personal protective equipment and other emergency response equipment are in place.
- The Prime Contractor shall be responsible for ensuring that personnel involved in the highway reinstatement works are adequately trained in the handling and transportation of “Dangerous Goods” as defined under the *Transportation of Dangerous Goods Act*, and of “Controlled Substances” as defined under the Occupational Health & Safety Regulation, BC Regulation 296/97.
- The Prime Contractor will be responsible for maintaining Safety Data Sheets (SDS) for potentially hazardous products used during the work and personnel involved in the highway reinstatement works will be familiar with guidelines for safe handling, storage, and use.
- Where the highway reinstatement works results in the generation of “Hazardous Wastes” as defined under the Hazardous Waste Regulation of the *Environment Management Act*, or unused “Controlled Substances” as defined under the Occupational Health & Safety Regulation, then these hazardous wastes will be kept separate from non-hazardous construction wastes and refuse and disposed of in compliance with the requirements of the Hazardous Waste Regulation and *Environmental Management Act*.

5.7 Solid Waste Management

The following measures will be implemented to manage Project related waste:

- Construction wastes and debris will be disposed of at an approved disposal facility in compliance with the *Environmental Management Act* and applicable municipal bylaws.
- Safe area for temporary waste storage will be designated and waste materials will be categorized and labelled appropriately (e.g., common garbage, food waste, hazardous waste). Food waste will be collected daily from work areas and will be disposed off-site in an appropriate and safe manner. Domestic garbage will be centralized into a common facility daily and removed to appropriate off-site facilities as required.
- An appropriate quantity and placement of garbage receptacles and recycling containers will be used to promote work-site cleanliness and sustainable practices.
- On-site burial or burning of solid waste will not occur
- Temporary sanitary facilities (i.e., portable toilets) will be available on-site for the use of workers. They will be placed more than 30 m from Willband Creek and will be secured to prevent tipping.

5.8 Concrete Waste Management

The following mitigation measures will be implemented specifically for concrete materials in accordance with MOTI's *Standard Specifications for Highway Construction* Subsections 165.14.04, 165.02.03 (f)(vi) and 145.27.02 (MOTI 2020):

- The release of waste concrete, concrete slurry or water that has come into contact with uncured concrete is not permitted in the Project area. Cement or concrete-contaminated waste water shall be tested prior to release. Waste water shall be a pH of 6.5 – 8.0 before being released to the environment, outside of the Project area.
- The EM will monitor Willband Creek for elevated pH, turbid water and concrete slurry during all Cutter Soil Cement Mixing operations.

5.9 Air Quality

The highway reinstatement works is not anticipated to create stockpiles and or dust generation during the proposed dates, therefore only air quality management will be implemented in accordance with the following measures:

- Vehicles and equipment will be operated and maintained according to manufacturer's guidelines and monitored regularly for potential air quality concerns.
- Periodic maintenance of construction vehicles. In addition, excessive or consistently black exhaust is a signal that an engine is not operating optimally. If black exhaust is noted, the Environmental Monitor shall be notified immediately.

5.10 Idle Reduction

The following measures will be implemented to mitigate potential Project impacts relating to idling:

- The Contractor shall develop an Idle Reduction Plan which is to be reviewed and approved by the MOTI.
- Idling of construction vehicles and equipment are to be minimized during periods of inactivity and while stopped within a queue formed under the direction of a traffic control person or device.
- Construction vehicles and equipment are not to exceed the following:
 - Motor vehicles and light diesel trucks - 1 minute;
 - Heavy duty diesel vehicles - 5 minutes;
 - Diesel Vehicles involved in construction Site passenger transportation – 10 minutes; and
 - Construction Equipment - exempt when actually employed at the Site for work intended.
- Idling for more than the above times is permitted only under the following circumstances:
 - When the vehicle or equipment is forced to remain motionless because of other traffic conditions or mechanical difficulties over which the operator has no control;
 - To bring the vehicle or equipment to the manufacturer's recommended operating temperature;
 - When the outdoor temperature is below 0°C or above +30°C and the operator or passengers are inside the vehicle, and there are no auxiliary power sources available to provide temperature control;
 - When it is necessary to operate auxiliary equipment that is located in or on the vehicle or equipment to accomplish the intended use of the vehicle or equipment (for example, cranes and cement mixers);
 - When the vehicle is detaching or exchanging a trailer;
 - When the vehicle or equipment is being repaired or engaged in repairing another vehicle, if idling is necessary for such repair;
 - When the vehicle or equipment is queued for inspection, if idling is necessary for such inspection;
 - For designated emergency vehicles or any vehicle or equipment assisting in police, fire or ambulance services; and/or
 - When defrosting or defogging windows. Idling shall end when fog, frost, or ice conditions have been eliminated.
- The Contractor shall implement a system of education and training as part of site orientation for all on-site staff and sub-contractors.

5.11 Noise Management

The following measures will be implemented to mitigate potential Project impacts relating to noise:

- Construction equipment must be operated with exhaust systems in good condition to minimize noise.
- Make sure that noise control devices (i.e., mufflers and silencers) on construction equipment are properly maintained.
- Limit unnecessary idling of equipment and machinery.
- Where feasible, contractors shall comply with noise level regulations and guidelines established by regulatory agencies and local governments having jurisdiction. Where a contractor is required to exceed noise levels or schedule work outside approved hours of work specified in municipal bylaws, the work shall be completed as quickly as possible, potentially affected stakeholders shall be notified.

5.12 Site Restoration Plan

Temporarily disturbed areas will be revegetated and restored in a manner that is environmentally sound, aesthetically pleasing, reduces erosion and transport of sediment-laden water. Site restoration shall address, but not be limited to:

- Removal of surplus materials and wastes from the work site(s), and subsequent disposal in appropriately authorized facilities.
- Disturbed soils will be re-seeded or hydroseeded with the MOTI standard Vancouver Island / Coast Mix according to Table 757-A of the *Standard Specifications for Highway Construction*; Section 757 – Revegetation Seeding (MOTI 2020).

6.0 ENVIRONMENTAL INCIDENTS

An environmental incident is an event that has caused, or has the potential to cause, one or more of the following:

- Damage to aquatic or terrestrial habitat.
- Adverse/harmful effects to fish, wildlife, or other environmental resources.
- Adverse publicity associated with impacts on the environment.
- Violation of statutes or regulatory authorizations.
- Environmental damage.

Examples of environmental incidents include, but are not limited to:

- Spill to the aquatic environment or a spill of reportable size under the BC *Environmental Management Act* Spill Reporting Regulation.
- Deposit of a deleterious substance.
- Serious harm to fish without prior authorization.
- Injury to wildlife or birds.

All environmental incidents are to be reported to the Prime Contractor and MOTI immediately.

An Environmental Incident Report (EIR) is to be prepared by the Contractor(s) and submitted to MOTI within 24 hours following an incident to provide a timely and accurate written notification of environmental incidents. The EIR will include the following information:

- Who reported, and responded, to the incident.
- A description of the incident (e.g., date, time, cause, personnel present, type of material spilled, environment affected).
- Actions taken to mitigate the incident.
- Preventative measures implemented following the incident.
- Photo documentation.
- Spill Report Number issued by the Provincial Environmental Emergency Program, if applicable.

In the case of a spill, protocol outlined in Section 5.5 should be followed. An End of Spill Report form template has been provided in Appendix A.

The written EIR is not intended to take the place of verbal notification of an incident requiring immediate action or further notification of regulatory agencies (e.g., a spill that affects neighbouring properties or requires assistance in the supply or deployment of containment equipment).

As well as internal reporting to MOTI and external reporting to authorities (i.e., Environmental Emergency Program), it may be necessary in some situations to report an environmental incident to local municipal environmental representatives and owners of neighbouring properties. MOTI will provide these notifications.

7.0 LIMITATIONS

This document has been prepared for the exclusive use of MOTI and its Contractor(s) during Highway 11 reinstatement works. Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. WSP accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

This report was prepared, based in part, on information obtained from historic information sources. In evaluating the subject Site, WSP has relied in good faith on information provided. We accept no responsibility for any deficiency or inaccuracy contained in this report as a result of our reliance on the aforementioned information.

The findings and conclusions documented in this report have been prepared for the specific application to this project and have been developed in a manner consistent with that level of care normally exercised by environmental professionals currently practicing under similar conditions in the jurisdiction.

With respect to regulatory compliance issues, regulatory statutes are subject to interpretation. These interpretations may change over time, these should be reviewed.

If new information is discovered during future work, the conclusions of this report should be re-evaluated and the report amended, as required, prior to any reliance upon the information presented herein.

8.0 CLOSURE

We trust this information is sufficient for your needs at this time. Should you have any questions or concerns, please do not hesitate to contact the undersigned.

WSP Canada Inc.



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APPENDIX A

End of Spill Report Form

This report template can be completed to satisfy the requirements of either the End-of-Spill Report or the Update to Minister Report. Please specify which report you are completing in section I of this form. If any of the fields of this form are not applicable to the spill for which this form is being completed, indicate 'N/A' in the field; reports with incomplete fields will be sent back to the responsible person.

End-of-Spill Report: Section 6 of the Spill Reporting Regulation outlines the requirements for the End-of-Spill Report. Responsible persons must submit a written End-of-Spill Report to the Ministry of Environment and Climate Change Strategy within 30 days following the emergency response completion date of a spill as outlined in section 6 (1) of the Spill Reporting Regulation. Responsible persons must submit a written report to the Ministry of Environment and Climate Change Strategy as soon as practicable if either of the following two conditions are present:

1. The spill entered, or was likely to enter, a body of water as defined in the Spill Reporting Regulation
2. The quantity of the substance spilled was, or was likely to be, equal to or greater than the listed quantity for the listed substance as outlined in the Spill Reporting Regulation

Update to Minister Report: Section 5 of the Spill Reporting Regulation outlines the requirements for the Update to Minister Report. Responsible persons must submit a written report to the Ministry of Environment and Climate Change Strategy as soon as practicable if any of the following three conditions are present:

1. On request of the Minister
2. At least once every 30 days after the date that the spill began
3. At any time that the responsible person has reason to believe that information previously reported in the Initial Report has become inaccurate or incomplete

Complete this form and submit it by email to SpillReports@gov.bc.ca. For additional information, please visit the British Columbia [Environmental Emergency Program Report a Spill webpage](#).

Dangerous Goods Incident Report (DGIR) number:

Section I: Type of report

Sections 5 and 6 of Spill Reporting Regulation

This form is completed to satisfy the requirements of the:

Update to Minister Report

End-of-Spill Report

Section II: Contact information

Section 6 (2) (a) of the Spill Reporting Regulation

Details for person filling out the report

Name of company representative:

Company name:

Email:

Address:

Telephone number:

Details for responsible person Same as above	Name of company representative:
	Company name:
	Email:
	Address:
	Telephone number:
Details for owner of the substance spilled Same as above	Name of company representative:
	Company name:
	Email:
	Address:
	Telephone number:

Section III: Timing of the spill

Section 6 (2) (b) of the Spill Reporting Regulation

Date of spill:	Time of spill:	Duration of the spill (days):
Date reported:	Emergency response completion date ¹ :	

Section IV: Site description

Section 6 (2) (c) (d) of the Spill Reporting Regulation

Provide a description of the spill site and the sites affected by the spill. The description of the spill site may include a description of the receiving environment, the proximity to a nearby city/town/roadway, the type of vegetation in the area, how densely populated the area is, accessibility to spill site, nearby waterways, and any other defining characteristics of the area.

Latitude:	Degrees	Minutes	Seconds
Longitude:	Degrees	Minutes	Seconds
or			
Site civic address or location:	Street		Postal Code
	City		
or			
DLS or BCNTS (if applicable):		Site ID number (if applicable):	

¹ For the definition of the *emergency response completion date*, please refer to [B.C. Reg. 187/2017 Spill Reporting Regulation](#)

Section V: Description of the source, type, and quantity of the spill

Section 6 (2) (e) (f) of the Spill Reporting Regulation

Description of the source of the spill (pipeline, rail, truck, facility, etc.):

Type of substance spilled (common name):

United Nations (UN) number of substance spilled (if applicable):

Item number from the table in the Schedule in the Spill Reporting Regulation:

Quantity (in litres or kilograms) of the substance spilled – if the quantity is unknown, provide a reasonable estimate and explain why the quantity is unknown and cannot be determined:

Section VI: Description of the circumstances, cause, and impacts of the spill

Section 6 (2) (g) (i) (ii) (iii) of the Spill Reporting Regulation

Provide a description of the activity during which the spill occurred (transportation, transfer of cargo, fuelling, cleaning, maintenance, etc.):

Provide a description of the incident leading to the spill (tank rupture, overfill, collision, rollover, derailment, fire, explosion, etc.):

Provide a description of the underlying cause of the spill (human error, external conditions, organizational or management failure, etc.):

Section VII: Impacts to human health, the environment, and infrastructure

Section 6 (2) (g) (iv) (v) of the Spill Reporting Regulation

Describe any adverse effects of the spill on human health (please state 'N/A' if there were no adverse effects on human health):

Number of people evacuated:

Number of fatalities:

Number of people injured:

Describe any adverse impacts on infrastructure² (please state 'N/A' if there were no adverse impacts to infrastructure):

Impacts to water

Was there an impact to a body of water?	Yes	No
---	-----	----

² For the definition of *infrastructure*, refer to section 91.1 of the [Environmental Management Act 2003](#)

Description of impact:	
Describe the body of water (stream, aquifer, fish habitat, naturally formed body of water, ditch, lake, etc.):	
Name of body of water:	
Impacts to the environment	
Was there an impact on flora (vegetation)? YES NO	If yes, list the common and species names:
Provide a description of the impact on flora (oiled, removed, etc.):	
Was there an impact on fauna (animals)? YES NO	If yes, list the common and species names:
Provide a description of impact on fauna (include injured, dead, etc.):	
Was there an impact on aquatic and/or terrestrial habitats? YES NO	If yes, list the type of habitat (riparian, breeding ground, etc.):
Provide a description of impact on aquatic and terrestrial habitats, including response actions taken to restore any of the impacts listed:	

Section VIII: Spill response actions**Section 6 (2) (h) of the Spill Reporting Regulation**

Action taken to comply with section 91.2 of the <i>Environmental Management Act 2003</i>	Who took the action (company, person, contractor, etc.)	Date that the action was taken (click the arrow or enter the date using the format YYYY-MM-DD)

Section IX: Waste disposal (please state 'N/A' if no waste was produced)**Section 6 (2) (i) of the Spill Reporting Regulation**

List the type of waste	Method of disposal	Location of disposal

Section X: Attached reports, maps, and photographs**Section 6 (2) (j) (k) of the Spill Reporting Regulation**

Report of results of sampling, testing, monitoring, and/or assessing carried out during spill response actions (including reports from Qualified Professionals), if applicable	Copy attached <input type="checkbox"/>
Map of the incident site and areas surrounding the incident site (required)	Copy attached <input type="checkbox"/>
Photographs of the spill (required)	Copy attached <input type="checkbox"/>

Section XI: Agencies on scene or notified**Section 6 (2) (l) (m) of the Spill Reporting Regulation**

List the names of all agencies that were at the incident site:

List the names of other persons or agencies that were advised about the spill:

Section XII: Additional comments

Section XIII: Verification of information provided

I confirm that the above information is true and complete.

Name of person completing form:

Date completed (YYYY-MM-DD)

Name of responsible person (person or company):

Date completed (YYYY-MM-DD)

Section XIV: Approval - For internal use only

Reviewed by:

Date completed (YYYY-MM-DD)

APPENDIX B

**BC Ministry of Environment and
Climate Change Strategy, Fact
Sheet 03 - Facts on the
Management of Environmental
Emergencies**

March 2021

Spill Reporting

Report spills immediately

If a spill occurs, or is at imminent risk of occurring, responsible persons (spillers) must ensure that it is immediately reported to the Provincial Emergency Program (PEP)/ Emergency Management British Columbia (EMBC) by calling **1-800-663-3456**.

Section 91.2 of *Environmental Management Act* (EMA) identifies the requirements for spill reporting. The [Spill Reporting Regulation](#) (SRR) prescribes the information that is required, as well as the time and manner in which it is required, when reporting spills.

This Fact Sheet is designed to provide information for responsible persons on their reporting obligations should they be in possession, charge, or control of a substance when it spills or is at imminent risk of spilling.

The SRR identifies three reports that responsible persons must make based on specific criteria: Initial Report; Update to Minister Report; and End-of-Spill Report. Responsible persons may also be required to make a fourth report, a Lessons-Learned Report, if ordered to do so by a director. The purpose of these reports is to ensure that the Ministry of Environment and Climate Change Strategy (the ministry) has the appropriate information necessary to assess spill impacts and fulfil oversight and regulatory roles and responsibilities.

Responsible Person

A responsible person has possession, charge or control of a substance or thing when a spill of the substance or thing occurs or is at imminent risk of occurring.

Definition of a Spill

A spill is defined by the *Environmental Management Act* as the introduction into the environment, other than as authorized and whether intentional or unintentional, of a substance or thing that has the potential to cause adverse effects to the environment, human health, or infrastructure.

Initial Report

Section 4 of the SRR outlines the information required in the Initial Report. An Initial Report must be made immediately if any of the following occur or is at imminent risk of occurring:

- 1. If the volume spilled, or likely to be spilled, is equal to or greater than the minimum quantity outlined in the SRR, the spill is reportable.** A list of substances and their reportable quantities is available in Appendix 2: Prescribed substances and quantities for immediate spill reporting of this Fact Sheet.
- 2. If the spill enters, or is likely to enter, a body of water, the spill is reportable.** A body of water is defined in the SRR and includes both marine and fresh bodies of water whether or not they usually

contain water or ice, as well as streams, lakes, ponds, rivers, creeks, springs, aquifers, ravines, gulches, wetlands, and glaciers. The requirement to report a spill of a listed substance of any quantity also includes spills that enter a ditch that is not self-contained and connects to a body of water.

The Initial Report must be made immediately to EMBC by calling 1-800-663-3456. Anyone can make the Initial Report; however, the responsible person must ensure the report has been made and all the information outlined in section 4 of the SRR has been reported. (Appendix 1)

Natural Gas
A release of natural gas is reportable if: <ol style="list-style-type: none">1. The spill is caused by a breakage in a pipeline or fitting operated above 100 pounds per square inch (psi) that results in a sudden release of natural gas; and2. The amount of the spill is, or is likely to be, equal to or greater than 10 kilograms (kg).

Update to Minister Report

Section 5 of the SRR outlines the requirement for the submission of Update to Minister Reports. Responsible persons must provide an Update to Minister Report:

- 1. As soon as possible on request of the minister.**
- 2. At least once every 30 days after the date that the spill began** until such time that an End-of-Spill Report is required.
- 3. At any time that the responsible person has reason to believe that information that was previously reported as part of the Initial Report, as outlined in Appendix 1, was or has become inaccurate or incomplete.**

If the Update to Minister Report is requested by the Minister or if the spill lasts more than 30 days and the Update to Minister Report is required, an email will be sent by the ministry to the responsible person with instructions on how to complete the report form and how it must be submitted.

If the responsible person believes information previously reported as part of the Initial Report was or has become inaccurate or incomplete, the responsible person can contact the Environmental Emergency Program at SpillReports@gov.bc.ca, stating the Dangerous Goods Incident Report number in the subject line, to advise that an Update to Minister Report is required. Instructions on how to complete the report form and how it must be submitted will be sent to the responsible person by email.

End-of-Spill Report

Section 6 of the SRR outlines the requirement for the submission of End-of-Spill Reports. Responsible persons must submit a written report to the ministry within 30 days following the emergency response completion date of a spill, see information box below. An End-of-Spill Report is required when:

- 1. The volume spilled is equal to or greater than the minimum quantity outlined in the SRR.** A list of substances and quantities for immediate spill reporting (is provided in Appendix 2.):
- 2. The spill enters, or is likely to enter, a body of water-** 'body of water' is defined in the SRR.

The accountability to adhere to the requirements set out in the SRR is that of the responsible person. All reports, other than the Initial Report, are to be sent to the Environmental Emergency Program at SpillReports@gov.bc.ca.

Emergency Response Completion Date

The emergency response completion date is defined in section 8 of the SRR as the date that all the following criteria are met:

1. The Incident Command Post is disestablished.
2. The source of the spill is under control and is neither spilling nor at imminent risk of spilling.
3. Emergency actions to stabilize, contain, and remove the spill have been taken.
4. The waste has been removed from the spill site.
5. All evacuation notices have expired or been rescinded.
6. All equipment, personnel, and other resources used in emergency spill response actions have been removed from the spill site, other than resources required for sampling, testing, monitoring, assessing the spill site, or for recovery and restoration of the spill site.

Lessons-Learned Report

Section 7 of the SRR outlines the requirements of a Lessons-Learned Report. Within six months following the emergency response completion date of a spill, the director may order a Lessons-Learned Report from the responsible person. This report must be submitted to the director in the manner and form specified by the director. For additional information on the Lessons-Learned Report, please see the Lessons-Learned Fact Sheet.

B.C. Oil and Gas Commission Equivalency

Responsible persons regulated by the B.C. Oil and Gas Commission (the Commission) under the [Emergency Management Regulation](#) must provide an Initial Report to EMBC, but are exempt from the following requirements in the SRR:

- Section 5 Update to Minister Report;
- Section 6 End-of-Spill Report; and
- Section 7 Lessons-Learned Report.

Fines and Penalties

It is the responsibility of regulated persons, responsible persons and the owners of substances or things to understand and comply with EMA and its associated regulations.

This document is solely for the convenience of the reader and is intended to assist in understanding the legislation and regulations, not replace them. It does not contain and should not be construed as legal advice. Current legislation and regulations should be consulted for complete information.

Failure to be in compliance can result in convictions of fines and imprisonment, as outlined in *EMA* and its associated regulations.

Additional Fact Sheets

Fact sheets on other relevant topics are published by the Environmental Emergency Program (EEP) and available at:

www.gov.bc.ca/spillresponse

The complete list of available Fact Sheets:

- 01 Regulated Person
- 02 Responsible Person
- 03 Spill Reporting
- 04 Lessons-Learned Report
- 05 Cost Recovery
- 06 Requirement to Provide Information
- 07 Spill Contingency Planning
- 08 Testing Spill Contingency Plans
- 09 Recovery Plan

**For more information, contact the
Environmental Emergency Program
at: SpillReports@gov.bc.ca**

Appendix 1: Initial Report content

Report information	Description
1. Contact information of the individual making the report	First and last name, phone number, and email address
2. Contact information of the responsible person	First and last name, phone number, and email address
3. Contact information for the owner of the substance spilled	First and last name, phone number, and email address
4. Location, date, and time of the spill	Provide as much location specific information as possible, including: general directions, description of how to approach the area, latitude and longitude if available, street address, and the date and time in 24-hour clock format
5. Description of the spill site and surrounding area	Provide a description of the receiving environment of the spilled material (for example, the area is wooded and the ground is soft; there are sensitive riparian areas that are at risk of contamination)
6. A description of the source of the spill	The container from which the material spilled (for example, fishing vessel, above- or below-ground storage tank, tanker truck, pipeline, or railcar)
7. Type and quantity of the substance spilled	An estimate of the amount of product spilled and a description of the product type, including product name, UN number, and Safety Data Sheet [SDS] (for example, diesel, UN 1202, 50 liters). If unknown, a description of the spill (for example, sheen or slick approximately 20 meters by 20 meters)
8. Cause and impact of the spill	The circumstances leading to the spill; the immediate cause as well as any contributing factors. May be a combination of the activity and the incident (for example, motor vehicle accident, derailment, equipment failure, fire, human error, intentional/unauthorized release, natural occurrence, or unknown)
9. Details of the actions taken or proposed	Provide any necessary/ helpful details of the actions taken or planned (for example, what steps have been taken to contain the spill, which responders have been deployed, and when they will be on scene)
10. The details of further action contemplated or required	Provide any necessary/ helpful details regarding next steps, including response actions, deployment of additional resources, and monitoring activities
11. The names of agencies on scene	Any persons, government, federal government, local government, or Indigenous agencies
12. The names of other persons or agencies advised concerning the spill	Any persons, government, federal government, local government, or Indigenous agencies

Appendix 2: Prescribed substances and quantities for immediate spill reporting¹

Item	Column 1 Substance Spilled	Column 2 Specified Amount
1	Class 1, Explosives as defined in section 2.9 of the Federal Regulations²	50 kg, or less if the substance poses a danger to public safety
2	Class 2.1, Flammable Gases, other than natural gas, as defined in section 2.14 (a) of the Federal Regulations	10 kg
3	Class 2.2 Non-Flammable and Non-Toxic Gases as defined in section 2.14 (b) of the Federal Regulations	10 kg
4	Class 2.3, Toxic Gases as defined in section 2.14 (c) of the Federal Regulations	5 kg
5	Class 3, Flammable Liquids as defined in section 2.18 of the Federal Regulations	100 L
6	Class 4, Flammable Solids as defined in section 2.20 of the Federal Regulations	25 kg
7	Class 5.1, Oxidizing Substances as defined in section 2.24 (a) of the Federal Regulations	50 kg or 50 L
8	Class 5.2, Organic Peroxides as defined in section 2.24 (b) of the Federal Regulations	1 kg or 1 L
9	Class 6.1, Toxic Substances as defined in section 2.27 (a) of the Federal Regulations	5 kg or 5 L
10	Class 6.2, Infectious Substances as defined in section 2.27 (b) of the Federal Regulations	1 kg or 1 L, or less if the waste poses a danger to public safety or the environment
11	Class 7, Radioactive Materials as defined in section 2.37 of the Federal Regulations	Any quantity that could pose a danger to public safety and an emission level greater than the emission level established in section 20 of the Packaging and Transport of Nuclear Substances Regulations, 2015 (Canada)
12	Class 8, Corrosives as defined in section 2.40 of the Federal Regulations	5 kg or 5 L
13	Class 9, Miscellaneous Products, Substances or Organisms as defined in section 2.43 of the Federal Regulations	25 kg or 25 L

¹ If the spill enters, or is likely to enter, a body of water, it is reportable regardless of the quantity
 'Federal regulations' refer to the Transportation of Dangerous Goods Regulations under the *Transportation of Dangerous Goods Act 1992*
 'Hazardous Waste Regulation' refers to B.C. Reg. 63/88

14	Waste containing dioxin as defined in section 1 of the Hazardous Waste Regulation	1 kg or 1 L, or less if the waste poses a danger to public safety or the environment
15	Leachable toxic waste as defined in section 1 of the Hazardous Waste Regulation	25 kg or 25 L
16	Waste containing polycyclic aromatic hydrocarbons as defined in section 1 of the Hazardous Waste Regulation	5 kg or 5 L
17	Waste asbestos as defined in section 1 of the Hazardous Waste Regulation	50 kg
18	Waste oil as defined in section 1 of the Hazardous Waste Regulation	100 L
19	Waste that contains a pest control product as defined in section 1 of the Hazardous Waste Regulation	5 kg or 5 L
20	PCB wastes as defined in section 1 of the Hazardous Waste Regulation	25 kg or 25 L
21	Waste containing tetrachloroethylene as defined in section 1 of the Hazardous Waste Regulation	50 kg or 50 L
22	Biomedical waste as defined in section 1 of the Hazardous Waste Regulation	1 kg or 1 L, or less if the waste poses a danger to public safety or the environment
23	A hazardous waste as defined in section 1 of the Hazardous Waste Regulation and not covered under items 1 - 22	25 kg or 25 L
24	A substance, not covered by items 1 to 23, that can cause pollution	200 kg or 200 L
25	Natural gas	10 kg, if there is a breakage in a pipeline or fitting operated above 100 psi that results in a sudden and uncontrolled release of natural gas

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