

**TEMPLATE ONLY**

Note: Use this document as a guideline for your project's Construction Environmental Management Plan. It is not an exhaustive list of all sections. Modify and apply as per your project requirements.

Month, YYYY

Insert Project Name  
Construction Environmental Management Plan | DD Month, YYYY

**Phase**

**Project Name**

# Construction Environmental Management Plan

Photo optional

Prepared by:

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Phone

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XXXX-XXXX-XX

Document Number

XXX-XXXX-XX

Revision X

*Revision Record*

Rev.	Description	Originator	Checker	Approved	Date
A					
B					
C					
D					

## How to use this template:

Cues and instructions for completing the Construction Environmental Management Plan (CEMP) are provided while inexhaustible examples, additional depth and detail is expected for the CEMP submission that is specific to the works. It is not mandatory to arrange content in this order or format; however, it is critical that the CEMP is inclusive of all content. Refer to the following primary resources while creating this living document:

### Standard Specifications for Highway Construction (MoTI 2016)

The CEMP must be completed in general accordance with Section 165 Protection of the Environment (2016).

*“The CEMP must be inclusive of all elements relevant to the complete scope and duration of the work being undertaken and, including, but not limited to, the following:*

- *A clear description of how the work will comply with the environmental protection requirements of the Contract, including, but not limited to, the Standard Specifications, Special Provisions, and Environmental Approvals;*
- *A summary that clearly demonstrates the Contractor’s understanding of the specific environmental issues involved with the Work, including Environmental Approvals;*
- *A description that demonstrates the Contractor’s understanding of MoTI /Contractor responsibilities;*
- *Clear identification of the process, including duration and sequence of each task, leading to the receipt of agency approvals, and the linkage between the process and the project schedule; Environmental Procedures;*
- *Contact names, positions and telephone numbers of individuals responsible for elements of the plan and Environmental Agency contacts.”*

See SS 165.03.02 *Compliance with Environmental Legislation and Regulatory Requirements* for a comprehensive listing of Best Management Practices and Environmental Agencies areas of concern.

\*Please note that although quotations and specific references to Section 165 are made throughout this template for the convenience of the user, it is expected that Section 165 will be read and understood in its entirety. It is possible that additional information is required under headings which may or may not be included in this document.

### 1.25 Protection of the Environment – Main Tender

McElhanney has provided this template for the Project CEMP (2018). The Contractor shall prepare the CEMP, based on this template which is to be prepared and/or signed and accepted by an Appropriately Qualified Professional (AQP), which describes in detail the approach to be taken in addressing environmental issues associated with the Project and the correlation of the CEMP to the project schedule. The CEMP must be inclusive of all elements relevant to the complete scope and duration of the work being undertaken as set out in SS 165.02.02 and SS 165.02.03, and these Special Provisions.

Further to SS 165.02.03, the Contractor shall provide, at a minimum, the following Environmental Procedures and sub-plans as a component of the CEMP:

- Clearing & Grubbing Plan (see template Section 9.1);
- Invasive Species Management Plan (see template Section 9.2);
- Fish, Amphibian and Wildlife Salvage Plan (see template Section 9.3);
- Bird Nest Survey & Management Plan (see template Section 9.4);
- Erosion & Sediment Control Plan (see template Section 9.5);
- Environmental procedure for tie-in and commissioning of the new Keith Creek channel (see template Section 9.7, SS 9.7.3);

- Wildfire Management Plan (see template Section 9.8);
- Riparian Planting Plan (see template Section 9.9, SS 9.9.2) and;
- Topsoil Salvage Plan (see template Section 9.11).

If detailed procedures are not yet available when the initial CEMP is provided for Approval, MoTI would accept submissions for approval at a later date, and once accepted, they would become part of the CEMP, as per SS 165.02.02.

The CEMP shall be provided to MoTI at least 15 days prior to mobilization to the site. Work shall not proceed without approval and acceptance of the CEMP by MoTI or their designate. The Contractor shall make copies of the CEMP accessible to personnel on-site.

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## Appendices

Add additional Appendices (which may include specific work plans, incident report form etc) as needed.

- A Weekly Monitoring Template Report
- B FLNRORD Approval File: XXXXXXXX
- C DFO Authorization: XXXX-XXXXXXXX
- D MOTI Bird Nest Survey Protocol
- E Archaeological Chance Find Protocol
- F Environmental Orientation/Training Record

## Acronyms Used in This Report

Populate this list with any acronyms used in the CEMP. In the body of the report use the non-abbreviated form followed by the acronym in brackets when introducing a term. Consecutive uses are to use the acronym.

AQP	Appropriately Qualified Professional
BC	British Columbia
BMPs	Best Management Practices
CEMP	Construction Environmental Management Plan
DFO	Fisheries and Oceans Canada
EM	Environmental Monitor
EMBC	Emergency Management of BC
MBCA	Migratory Birds Convention Act
MFLNRORD	Ministry of Forests, Lands, Natural Resource Operations and Rural Development
MoTI	Ministry of Transportation and Infrastructure
NTU	Nephelometric Turbidity Units
SARA	Species at Risk Act
SDS	Safety Data Sheet
TDG	Transportation of Dangerous Goods
TSS	Total Suspended Solids

# 1. Introduction

In this section, provide a brief overview of the scope of work included in the Main Tender. This includes, but is not limited to, the client's name, type of work, phase, and a few additional details about the work plan. Also provide a summary of the contents of this CEMP.

# 2. Background

Provide background information on the project. Discuss the need for development and any environmental impacts to the surrounding features such as watercourses and wildlife. Mention any relevant work already completed for this project and include appropriate legislative details such as permits. Then, summarise the scope of work with some details about location, timeline and work plan. Ideally, include a map to show general extents of the site and impacts.



Figure X. Defined reaches along the project alignment.

# 3. Project Description

Methodically list and detail the phases or major construction activities to be undertaken by the Contractor, including methods, materials and equipment, with emphasis on tasks considered to carry higher environmental risk. Be as descriptive as possible and consider all elements that were identified during completion of the Environmental Overview (Hatfield 2017) and government agency submission for the realignment of Keith Creek (McElhanney 2018). You may consider creating specific headings outlining each component and including site drawings where applicable.

Explain how scheduling has been carefully planned to avoid or reduce potential impacts to sensitive environmental resources. This section should also include any relevant least risk windows applicable to the project. Key project elements bearing environmental risks that require detailed planning and scheduling considerations should be featured such as works to be conducted in or around water. See SS 165.02.01

*Planning and Scheduling* which states “The Contractor shall carefully plan and schedule construction activities in a manner that ensures the avoidance or absolute minimization or environmental damage” (MoTI 2016).

## 4. CEMP Objective

The CEMP describes site specific environmental protection measures and obligations that must be upheld and implemented for successful completion of the project.

Section 165 “*Protection of the Environment*” (MoTI Highway Design 2016) defines a CEMP as “a plan, written by an Appropriately Qualified Professional, that describes the environmental requirements of the Work and outlines the approach the Contractor will undertake to mitigate impacts. The CEMP describes the specific commitments that the Contractor will adhere to, with respect to the environmental protection, throughout the duration of the Work. It encompasses all element that may be addressed separately in mitigation, monitoring and action plans.”

## 5. Roles and Responsibilities

The purpose of this section is to specify the environmental responsibilities of all major parties and stakeholders involved with the project and their obligation to uphold and implement the CEMP.

### 5.1. MoTI Representative

The MoTI Representative will oversee Project construction activities for compliance with environmental provisions as defined in applicable legislation, regulations, guidelines, contract documents and specifications, this CEMP and standard provincial BMPs. List the tasks of the MoTI Representative.

### 5.2. Insert Name of Successful Contractor

The Contractor is tasked with the delivery of a quality product that meets or exceeds environmental considerations in accordance with the CEMP and applicable legislation. Discuss and/or list the general environmental obligations to be upheld by the Contractor including any additional details specified in tender documents.

“The Contractor shall observe and comply with all terms and conditions of Environmental Approvals. Unless otherwise indicated, the Contractor is responsible for all work needed to comply with the terms and conditions of Environmental Approvals. The Contractor shall make copies of all Environmental Approvals accessible to personnel on-site” (SS 165.03.02 *Compliance with Environmental Legislation and Regulatory Requirements*, MoTI 2016).

In addition, SS 165.02 states that “The Contractor shall retain the services of an EM.” This person shall be an AQP experienced in implementing fisheries enhancement projects and as set out in SS 165.02 and defined in 165.01.02.

### 5.2.1. Environmental Monitor

As per SS 165.01.02 of Section 165 Protection of the Environment (MoTI) an EM is defined as “an Appropriately Qualified Professional (see definitions) hired by the Contractor to ensure the Contractor’s compliance with the environmental protection aspects of Standard Specifications, Special Provisions, legislation, permits and approvals, and to advise the Contractor and MoTI Representative on environmental issues or concerns.”

The EM shall be available throughout the duration of the Work to represent the Contractor in all matters related to the protection of the environment and will attend all key meetings at which environmental protection measures are to be discussed.

The EM and the Contractor shall work together on development and implementation of the CEMP, including Environmental Procedures, as well as any applications for Environmental Approvals (SS 165.02 *Environmental Monitor*, MoTI 2016). The EM will review and/or prepare and be a signatory to the initial CEMP and all subsequent updated Plans.

**The MoTI is responsible for providing the following approvals/notifications for the realignment of Keith Creek and associated infrastructure:**

- (i) Change Approval under Section 11 of the Water Sustainability Act;**
- (ii) Authorization/Letter of Advice under the Fisheries Act;**

All project works shall be carried out in accordance with the authorizations and approvals listed above.

The Contractor will be responsible for obtaining any other permits / approvals, such as fish and/or wildlife salvage permits, or short-term water use permits, as required by environmental agencies or recommended by the Contractor’s EM.

### 5.2.2. Environmental Monitoring, Reporting, and Non-Compliance Resolution

The purpose of this section is to describe the process of environmental monitoring, reporting, and handling of non-compliance issues. Outline the required monitoring frequency (dependent on activity or phase) for the project and provide a reporting template as an Appendix.

In addition to SS 165.03.01 the Contractor’s EM shall develop a minimum monitoring and reporting frequencies which should take into consideration:

- Extent of instream works, might require full-time monitoring during instream work (with brief daily memo summary);
- Daily monitoring, but not necessarily full-time, during clearing and grubbing within a Special Erosion Protection Area (with brief daily memo summary); and
- Monitoring after periods of Inclement Weather per SS 165.02.06 (with brief summary memo).

Refer to the Main Contract Tender document for the required components of Contractor’s Environmental Monitoring Report.

Discuss potential non-compliance items and indicate how they will be documented. Designate specific points of contact for both minor and major deficiencies. discuss the authority and responsibility of the EM to suspend works with the potential to harm the environment. Outline the protocol which dictates that construction cease until remedial actions have been undertaken by the Contractor at the satisfaction of the EM. Describe the reporting process for suspension orders which are to include the nature of the non-compliance, the activity, location, time, and element of the CEMP or legislation that is being breached.

“A violation of the environmental laws and regulations reported to the MoTI by the responsible agencies may result in the issuance of a non-conformance report. Should the situation warrant more stringent measures, it may also result in the issuance of a stop-work order until the violation is corrected” (SS 165.03.02 Compliance with Environmental Legislation and Regulatory Requirements, MoTI 2016).

See SS 165.03 *Compliance, Enforcement and Payment* (MoTI 2016).

### 5.3. Communication Protocol

The purpose of this section is to provide detailed lines of communication with MoTI, the Contractor, regulatory agencies, and key stakeholders. This section should include protocols and responsibilities for reporting any issues pertaining to the environment. Provide a readily available list of contacts who are responsible for the implementation of the CEMP, including emergency contacts and external government agencies with the potential to be implicated by the project. This table should be updated on a regular basis.

Provide a readily available list of contacts who are responsible for the implementation of this CEMP, including emergency contacts and external government agencies with the potential to be implicated by the project. The table below is intended as a guide and should be modified and updated as required to facilitate the needs of the project.

The Table below lists the contact information for those involved with this Project.

*Table X. Emergency Contact List*

Project Personnel or Agency	Name	Company	Phone Number	Email:
Project Manager		MoTI		
Project Environmental Lead		MoTI		
Engineer of Record		McElhanney		
Contractor Personnel				

Environmental Monitor				
Construction Inspector				
Fortis BC		Fortis BC	1-800-663-9911	
BC Hydro		BC Hydro	1-888-769-3766	
Emergency Management BC			1-800-663-3456	
Environment Canada Spill Emergencies			604-666-6100	
RCMP / Ambulance			911	

**Any event that results in a reportable incident will be reported to MoTI immediately to determine the communication protocol for notifying the appropriate outside agencies as soon as practical.**

## 6. Regulatory and Permitting Requirements

The purpose of this section is to highlight all applicable federal, provincial, regulations for the project. At a minimum, include the regulation name, governing level (Federal, Provincial, etc.), a brief description of the regulation and how it applies to the project (including any provisions or timing windows). Discuss any resulting requirements such as need for an authorization, notification, etc. Include in this section, a list of environmental notices, permits, and approvals received prior to construction, as well any outstanding items. Copies of these documents must be provided in the appendices. This CEMP must stress the onus (on the Contractor) of having hard copies of all regulatory and permitting documents readily available.

The following sections highlight regulatory requirements for the Project.

### 6.1.1. Fisheries Act

The Fisheries Act (Canada 1985) is the leading Federal legislation protecting fish and fish habitat of Commercial, Recreational, or Aboriginal fisheries. Self-assessment guidelines issued by Fisheries and Oceans Canada (DFO) permits various activities to be undertaken without DFO consultation in and around watercourses provided that certain criteria are met.

**For the works pertaining to the realignment of Keith Creek, DFO involvement is required as this watercourse is fish bearing, therefore ‘serious harm to fish’ as part of a recreational, commercial or Aboriginal fisheries is applicable. There is low risk of Serious Harm occurring for this Project but it may need to comply with an Authorization. The Project is still required to adhere to all pertinent BMPs to be compliant. Sediment laden water and other deleterious substances are prohibited from entering Keith and Lynn Creek or otherwise leaving the site untreated.**

The Authorization has not been issued at time of tendering. The application for Authorization/Letter of Advice and supporting documents have yet to be submitted, which is expected in mid-July 2018 but once available will be provided in an Addendum.

### 6.1.2. Migratory Birds Convention Act

Migratory Birds Convention Act (MBCA): This Act (Canada 1994) prohibits the disturbance, destruction, or possession of migratory birds, their nests, or eggs. In addition, migratory bird habitat is protected under the MBCA which prohibits the deposit of oil, oily waters, or other substances harmful to migratory birds in any areas that they frequent.

**Any clearing must be compliant with the new MoTI protocols which may be achieved through bird nest surveys, conducted by a AQP, prior to undertaking tree clearing. The nesting season for the Lower Mainland is March 15 to August 15, of any year (Appendix D).**

The Clearing & Grubbing Plan (see template Section 9.1) and the Nest Survey & Management Plan (see template Section 9.4) will jointly address the commitments under the MBCA.

### 6.1.3. Species at Risk Act

Species at Risk Act (SARA): Federal lands are subject to the protection of species listed under Schedule 1 of SARA as extirpated, endangered or threatened (Canada 2002). It is an offence to kill, harm, harass, capture or take an individual, or destroy that species' residence if identified as critical habitat as specified in SARA.

**Hatfield (2017) reviewed the BC CDC database and identified two data records for occurrences of wildlife species at risk with the potential to occur in the project area.**

Salvages and handling of Pacific Water Shrew (*Sorex bendirii*) and Threaded Vertigo (*Nearctula* sp.), including the procurement of any applicable permits will be addressed in the Mammal, Fish, & Amphibian Salvage Plan (see template Section 9.3).

## 6.2. Provincial

### 6.2.1. Water Sustainability Act and Water Sustainability Regulation

Provincially, works around water are administered under *Water Sustainability Act*, Section 11. An Approval application package will be prepared to include all aspects for the works required for this project. There is a targeted 140-day process review period. Information collected will satisfy Ministry of Forests, Lands, Natural Resource Operations and Rural Development.

MoTI has applied for a Change Approval under the WSA and that the Contractor must comply with all terms and conditions of any future Approval or Notification for this project.

### 6.2.2. Wildlife Act

The provincial Wildlife Act (BC 1996c), Section 34, protects birds and their nests during the bird breeding season as well as the nests, nest trees and eggs of certain species of raptors all year.

While there is currently no stand-alone statute addressing threatened or endangered species in BC, the Wildlife Act is broad enough to prohibit harm to most vertebrates and establishes special penalties for non-permitted harassment or destruction of blue or red-listed species.

**Any clearing must be compliant with the new MoTI protocols which may be achieved through bird nest surveys, conducted by a AQP, prior to undertaking tree clearing. The nesting season for the Lower Mainland is March 15 to August 15, of any year (Appendix D).**

The Clearing & Grubbing Plan (see template Section 9.1) and the Nest Survey & Management Plan (see template Section 9.4) will jointly address the commitments under the Wildlife Act.

### 6.2.3. Riparian Areas Act (Fish Protection Act)

The provincial Fish Protection Act (BC 1997) provides legislative authority for water managers to consider impacts on fish and fish habitat before approving new licenses, amendments to licenses or issuing approvals for work in or near streams.

### 6.2.4. Environmental Management Act (Contaminated Sites and Hazardous Waste Regulations)

The Environmental Management Act and its supporting regulations are the leading statutes governing the characterization of contaminated sites and handling, transport, and disposal of contaminated and hazardous waste.

A Stage 1 Preliminary Site Investigation was conducted by McElhanney (February 2018) which provided an overview of potential sources of contaminants. Although no sources of contamination were identified in the immediate project area, the report indicates that the surrounding private residences may have or had underground heating oil tanks. In addition, the potential for encountering chance-find contaminated soils exists. The Soil Management Plan (see template Section 9.11) will address commitments under the Environmental Management Act.

## 7. Description of Existing Environmental Resources

Provide a brief description of the existing environmental conditions in and around the project site. Focus efforts on Environmentally Sensitive Areas which includes but is not limited to watercourses, designated sensitive areas and rare and endangered ecosystems, fish and fish habitat, vegetated areas containing rare and endangered flora/fauna, vulnerable aquifers and archaeological, heritage and cultural resources.

The MoTI Representative or Environmental Agencies may require one or more detailed, task specific, Environmental Procedures for any work in and around Environmentally Sensitive Areas.

## 8. Potential Project Effects Summary

The purpose of this section is to arrange construction activities in a matrix to determine potential impacts. As an added value, construction activities and associated Environmental Procedures should be referenced to the relevant section of the CEMP. Use the example provided in Table as a framework (expand line items to reflect the entire series of activities involved to complete the works).

Table X. Potential Effects Summary

Construction Activity	Potential Impact	Applicable to this project?	Relevant EMP Section
Tree Clearing	Riparian area disturbance	✓	9.1.1
	Nesting birds / raptors	✓	9.4

## 9. Mitigations & Best Management Practices

The purpose of this section is to provide mitigations and BMPs in the form of highly detailed task specific plans. These plans are intended to serve as guidance documents for the Contractor which provide clear and concise procedures for completing works in compliance with all applicable environmental legislation. Refer to federal, provincial and local legislation, regulations, standards, and guidelines for project specific BMPs.

### 9.1. Clearing & Grubbing Plan

The purpose of the Clearing and Grubbing Plan (GCP) is to mitigate the potential for erosion and sediment control issues if exposed mineral soils are left unabated due to clearing and grubbing previously vegetated areas. Compile task specific BMPs which will be strictly implemented in conjunction with the approved Erosion and Sediment Control plans prepared for this Project.

Review SS 165.05 *CGP* of Section 165 Protection of the Environment (MoTI 2016).

Clearing boundaries shall be demarcated in the field, and the Contractor's EM will ensure that vegetation outside of the clear and grub zone is not disturbed.

Prior to any clearing and/or grubbing operations being conducted, the Contractor must ensure that the following requirements have been addressed:

- 1) Bird nest surveys (see section 9.4)
- 2) Wildlife salvages (see section 9.3)
- 3) Invasive species management (see section 9.2)
- 4) Tree cutting permits (see section 9.1.1)
- 5) Vegetation management (see section 9.9)

### 9.1.1. Tree Cutting

“The Contractor is also responsible for obtaining any necessary tree removal permits from MFLNRORD prior to initiating any clearing” (SS 165.05 CGP, MoTI 2016).

## 9.2. Invasive Species Management Plan

The purpose of this section is to describe the treatment and handling of invasive plants which have been previously identified within the clearing limits. Refer to SS 165.15 Noxious Weeds and Herbicides which states “The Contractor is responsible for undertaking invasive plant management for invasive plants and noxious weeds that will be disturbed by the Works. Management methods, disposal sites and options, as well as BMPs, will be outlined in the Contractor’s Invasive Plant Management Plan, a component of the CEMP.

Invasive species observed within the project footprint include Japanese Knotweed (*Fallopia japonica*), Giant Hogweed (*Heracleum mantegazzianum*), Yellow Lamium (*Lamium galeobdolon*), Holly (*Ilex* sp.), Irish Ivy (*Hedera hibernica*), Scotch Broom (*Cytisus scoparius*), and Himalayan Blackberry (*Rubus armeniacus*) (Hatfield 2015). Occurrences of Giant Hogweed and Japanese Knotweed Infested Soil areas are demarcated on Figure X within the McElhanney EA. English Ivy (*Hedera helix*) has been observed within the Project footprint. Although English Ivy is not a listed provincially regulated noxious plant, it is prevalent throughout the forest assemblage, that is recognized as a serious, smothering invasive in much of southwestern BC and a priority species in the DNV. The Contractor shall follow BMPs to avoid the spread of English Ivy.

BMPs for invasive plant species should follow the enclosed link:

[http://www.th.gov.bc.ca/publications/eng\\_publications/environment/ManagingInvasivePlants.pdf](http://www.th.gov.bc.ca/publications/eng_publications/environment/ManagingInvasivePlants.pdf)

### 9.2.1. Knotweed Infested Soil

This purpose of this section it to describe the additional specific BMPs that the Contractor must follow to avoid the spread of Japanese Knotweed.

Soils within 20 m of any visible knotweed plant infestation shall be considered contaminated. MoTI will direct the Contractor as to where to haul the contaminated soil.

The Contractor shall follow specifications in Special Provisions 1.20 when working near knotweed infested soil and plant matter. Invasive Japanese Knotweed has been observed on both sides of the Highway 1 in and around Keith and Lynn Creeks. The infested area is defined as 20 m in all directions from the outside edge of the visible knotweed patch. Knotweed sites are also located on the drawings.

Above ground plant matter must be disposed of at an approved incineration facility.

All soil within the infested area is considered contaminated with knotweed root matter. Knotweed infested soil must be disposed of at a site designated by the Mini MoTI Representative. The size and configuration of the completed disposal site must be surveyed by GPS and the coordinates provided to the MoTI Representative.

All construction equipment that in contact with Knotweed and/or Knotweed infested soil must be cleaned thoroughly before it leaves the worksite, including personal tools, equipment, footwear and vehicles.

Measurement for Knotweed Infested Soil Relocation will be based on the actual volume of cubic meters of soil moved. The volume measurement will not include above ground plant matter.

## 9.3. Mammal, Fish, & Amphibian Salvage Plan

It is anticipated that fish, amphibian, Threaded Vertigo, and Pacific Water Shrew salvage will be required. The Contractor will be responsible for obtaining permits / approvals for such activities. In the following subsections detail the salvage procedures and methods including rationale.

### 9.3.1. Pacific Water Shrew Management

The Contractor will obtain the services of AQP to undertake a Pacific Water Shrew Salvage. Except for the Highway 1 / Mountain Highway Interchange southeast quadrant and the Keith Creek upper culvert crossing Highway 1, and Keith Creek lower culvert inlet, these salvages will be completed prior to the Contractor obtaining Site access. The Contractor will be expected to maintain the exclusion fencing during construction unless otherwise permitted under the advice of the MoTI Representative and the Contractor's EM.

Prior to construction, the Contractor must perform salvage activities for Pacific Water Shrew according to the BMPs for salvage protocol, under a valid permit, for example as outlined in the following document:

**Best Management Practices Guidelines for Pacific Water Shrew in Urban and Rural Areas. Version May 2010. Craig, V.J.; R.G. Vennesland and K.E. Welstead. Prepared for the Pacific Water Shrew Recovery Team. Pp. 18-21.**

### 9.3.2. Threaded Vertigo Management

The Contractor will obtain the services of AQP to undertake a Threaded Vertigo Salvage. Except for the Highway 1 / Mountain Highway Interchange southeast quadrant and the Keith Creek upper culvert crossing Highway 1, and Keith Creek lower culvert inlet, these salvages will be completed prior to the Contractor obtaining Site access. The Contractor is responsible for obtaining any relevant permits associated with salvage operations. The Contractor will be expected to maintain the exclusion fencing during construction unless otherwise permitted under the advice of the MoTI Representative and the Contractor's EM.

### 9.3.3. Amphibian Salvage

The Contractor will be responsible for any required amphibian salvages, chiefly Keith Creek and associated riparian areas, which is to be cleared of vegetation and infilled once it has been realigned and tied into the new channel. Describe the methods and handling techniques which will be employed during these salvages and the qualifications of the personnel involved. The Contractor is responsible for obtaining any relevant permits associated with salvage operations.

### 9.3.4. Fish Salvage

The Contractor will be responsible for any required fish salvages, mainly on Keith Creek, which is to be realigned and infilled once it has been tied in to the new channel. Describe the methods and handling techniques which will be employed during these salvages and the qualifications of the personnel involved.

Refer to SS 165.10.01 *Fish Passage and Fish Salvage*:

“The Contractor and the EM shall be responsible for fish salvage operations, including the timely acquisition of fish collection permits from DFO and any provincial Environmental Agencies.”

## 9.4. Nest Survey & Management Plan

The regional breeding bird nesting period for the Project occurs between March 15th to August 15th of any given year (Environment and Climate Change Canada). The intent of this window is to reduce potential risk of contravention to the Migratory Birds Convention Act. Additional information can be found at:

**<https://www.canada.ca/en/environment-climate-change/services/avoiding-harm-migratory-birds/general-nesting-periods.html>**

If clearing and/or grubbing operations are required during this nesting period, the Contractor shall retain an AQP to conduct an intensive survey of the area(s) where vegetation is to be removed and in accordance with the MoTI Breeding Bird Nest Survey Protocol included in the Contract Appendix.

In accordance with the protocol, clearing activities can commence if no active nests are found unless otherwise protected under BC Wildlife Act, Section 34. In the event any active nests are identified, the Contractor’s EM shall be responsible for developing and implementing a site-specific nest management plan.

Regardless of the time of year, a nest survey shall be conducted to ensure compliance with the BC Wildlife Act.

In accordance with Section 34 of the BC Wildlife Act, nests of Osprey, eagle, peregrine falcon, gyrfalcon, heron or burrowing owl are protected year-round, whether the nest is occupied or not. In the event a protected nest is found, the Contractor’s EM shall be responsible for developing and implementing a site-specific nest management plan.

The Contractor will be required to schedule Work accordingly.

Any required breeding bird or nest surveys shall be the sole responsibility of the Contractor and will be performed and documented to the satisfaction of the MoTI Representative.

## 9.5. Erosion & Sediment Control Plan

The purpose of this section is to develop a phased Erosion and Sediment Control Plan (ESCP) expansive to all stages of construction. This plan must be specifically adapted to the scope of the project with methodical mitigation measures.

Erosion and sedimentation are major concerns with respect to their potential impact on water quality and fish habitat. The Contractor is responsible for planning, scheduling and performing this Work in such a manner that the quality of water flowing from and through the Site is at all times acceptable to officials of DFO, MFLNRORD and DNV, and will take immediate action to correct any deficiency in water quality. The Contractor is responsible for maintaining conditions which 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 plan generally consists of two main components:

- Erosion control relates to source control with the intent of preventing sedimentation of storm or surface water; and
- Sediment control relates to prescriptions available to mitigate effects of sediment-laden water following the erosion of a source and entrainment of that source into a source of water.

Review the SS 165.04 *Erosion, Sediment, and Drainage Control* of Section 165 Protection of the Environment (MoTI 2016):

The following areas of the Project, which are characterized by poor drainage, standing water, and/or drainage flowing directly into fish-bearing streams or sensitive watercourses, are designated as Special Erosion Protection Areas:

- Any area within 10 m of the top of bank of all unnamed tributaries and roadside ditches;
- Any area within 30 m of the top of bank of Keith Creek;
- Any area within 30 m of the top of bank of Lynn Creek;
- Any area within 30 m of the top of bank of Lynn Creek;
- Any catchment area with potential to dewater into a municipal storm drain.

Pursuant to SS 165.04.01, separate ESCP for Work in the Special Erosion Protection Areas will be required and will be subject to review on a weekly basis by the MoTI Representative and the Contractor. Where required by the MoTI, the Contractor will submit an updated ESCP to the MoTI Representative for acceptance.

In addition to requirements under SS 165.04.01 at least one of the water quality monitoring locations shall be immediately downstream from the confluence of Keith Creek and Lynn Creek (to be addressed in the ESCP, Section 9.5).

The Contractor shall also ensure that all activities are conducted in a manner that prevents the release of construction materials, concrete and grout materials and other deleterious substances into the environment. A deleterious substance is considered any substance which is harmful to fish and /or fish habitat and is inclusive of sediment and other toxic substances.

Finally, demonstrate an understanding of SS 165.02.06 *Incllement Weather* which holds the Contractor accountable for siltation of any Watercourse due to poor judgement and planning in the event of a significant weather event.

## 9.6. Water Management Plan

This section should compliment the ESCP and must describe how the Contractor intends to manage all sources and quality of water within the project footprint. This includes both storm and waste water generated as a by-product of construction activities. As major instream works are relevant to this project (ie. Keith Creek Realignment), this section must also outline plans to dewater and divert flows to isolate work areas and maintain relatively dry conditions within the work area. The new channel will be dug and remain dry until the tie-in during the 2019 instream work window.

### 9.6.1. Water Detention & Treatment Facilities

The extent of water detention and treatment facilities required by the Contractor to meet its responsibilities for protection of the aquatic environment while carrying out the Work will depend on a number of factors, including but not limited to the methods and schedule chosen by the Contractor for performing the Work, and the weather or other Site conditions encountered during the Work.

Where facilities for water detention or treatment are shown on the Drawings, or otherwise required as part of the Work, they have been designed only for conditions which will apply after the completion of the Work. Unless otherwise stated elsewhere in these Special Provisions or on the Drawings, such facilities may be used by the Contractor for runoff detention and treatment while carrying out the Work, subject to the MoTI Representative's approval and subject to the Contractor's discretion as to their effectiveness for this purpose. Whether intentionally so used or not, these facilities will be restored by the Contractor prior to completion of the Work to the lines and grades specified in the Contract Documents Package.

Whatever further water treatment facilities may be necessary will be provided, maintained and removed by the Contractor.

Refer to SS 165.04.03 *Sediment Control Ponds* for further guidance.

### 9.6.2. Water Quality

The purpose of this section is to specifically state standards and expectations in terms of water quality that the Contractor must uphold so that discharged flows are compliant with federal, provincial, and municipal legislation.

### 9.6.3. Water Quality Monitoring

In this section, describe the water quality monitoring program that will be implemented to document and record pertinent parameters (primarily field measurements of turbidity and pH) on all watercourses prior to, during, and after construction works. Stress that the water quality monitoring program is fluid to facilitate adjustments that may arise such as changes in construction activities or weather systems.

#### 9.6.4. Excess Surface & Ground Water

The purpose of this section is to provide specific BMPs for proper handling and disposal of excess water which may accumulate in excavations or general construction areas.

#### 9.6.5. Handling Suspect Contaminated Water

The purpose of this section is to identify protocols for handling and properly disposing of chance find contaminated ground or surface water. This pertains to contaminated water which was not directly generated by current construction activities. Evidence of suspect contaminated groundwater includes odour, sheen, or discoloration. In this section outline the procedure to be followed should suspect surface or groundwater be discovered at or near the site. Stress the importance of retaining documentation/manifests for inclusion in the environmental records.

### 9.7. Working In & Around Water

#### 9.7.1. Machinery & Equipment

The CEMP must consider BMPs pertaining to heavy equipment and machinery working near a water source to mitigate non-permitted environmental damage. Provide a figure indicating designated refuelling areas.

Refer to SS 165.13.03 *Servicing of Equipment*. “The fuelling, refuelling, servicing or washing of machines or equipment shall not be undertaken within 30 m of any Watercourse or surface water drainage.”

Refer to SS 165.13.04 *Equipment Operation in Environmentally Sensitive Areas* for guidance relating to the operation of equipment in Fisheries Sensitive Zones and Designated Watercourses.

#### 9.7.2. Fisheries Timing Windows

*Terms and Conditions for changes in and about a stream specified by MWLAP Habitat Officers, Lower Mainland Region (MOE 2006)* specifies that “To protect habitat, a person making a change in and about a stream under this regulation, other than under section 44(1)(o) to (s) or (2), must make that change in accordance with terms and conditions specified by the habitat officer with respect to the timing window or the period or periods of time in the year during which the change can proceed without causing harm to fish, wildlife or habitat. For this location the Reduced Risk Timing Window is August 1<sup>st</sup> to September 15<sup>th</sup> of any year.

Any activity required below High-Water Mark of a Designated Stream, including but not limited to construction of temporary site access, installation of scour protection and driving of pier piles, shall be carried out only within the Fishery Timing Window. Should the Contractor require an extension to the Fishery Timing Window, the Contractor will be responsible for preparing the rationale to work outside of the Fishery Timing Window and will obtain the support and sign-off from an AQP for this request. Final decision

for extensions to the Fishery Timing Window rests with the MoTI Representative and Environmental Regulators (e.g. MFLNRORD and/or DFO).

The Contractor shall review all necessary permits, authorizations and approvals in place, including any Water Sustainability Act approvals/notifications and Fisheries Act authorizations, and acquire any fish/amphibian salvage permits required, prior to any Works below the “top of bank” or “high water mark” and ensure that Works comply with all conditions as set out in the Environmental Permits and Approvals.

Construction of the new Keith Creek Channel, while not required to be undertaken during the above-specified window, must only occur upon receiving formal approval or authorization from senior environmental regulatory agencies. Commissioning and tie-in of the new channel shall occur during the specified Fishery Timing Window.

### 9.7.3. Keith Creek Tie-In

The purpose of this section is to provide the contractor with a specialized plan relating to the tie-in of the headwaters of Keith Creek to the realigned channel. This is a vital component of the Main Tender and a high level of detail is expected. You may wish to submit this plan as an Appendix. It must include detailed drawings and mitigative measures that prevent siltation and protect fisheries interests. Describe any equipment which will be utilized to complete this task and methods for temporarily diverting flows (including contingency plans). You should refer to SS 165.17.02 *Screened Intake Requirements* for guidance pertaining to intakes of pumps or diversions which withdraw water from fish bearing watercourses.

## 9.8. Wildlife Management Plan

The purpose of this section is to detail strategies which will be implemented to prevent unnecessary interactions with wildlife. If applicable, discuss any known nuisance or aggressive animals previously encountered in the immediate or surrounding area. Prescribe detailed mitigative procedures for items such as handling food wastes and training workers (including deterrents, driving, harassment, reporting, etc.).

Refer to SS 165.19 *Protection of Livestock and Wildlife*: “The presence of wildlife in or adjacent to the project site, field office trailers or construction camp shall not be encouraged by feeding. The Contractor is required to inform work crews of the location of wildlife crossing sites situated within the boundaries of the construction area.”

Evidence of black bears (claw marks on young alder trees) and coyotes (scat) were observed in and around the project area (Hatfield 2017).

Design a protocol for reporting and documenting wildlife interactions, sightings, or entrapment within features of the construction site (provide BMPs).

## 9.9. Vegetation Management Plan

The purpose of this section is to detail the practices that will be implemented to minimize impacts both inside and outside the project footprint in terms of vegetation clearing and any required tree trimming and brushing removal tasks validated and authorized by the MoTI Representative.

### 9.9.1. Tree & Vegetation Removal

In this section, provide site specific BMPs to be implemented by the Contractor when removing trees and vegetation.

Refer to SS 165.05.02 *Protection of Vegetation* for additional guidance.

### 9.9.2. Riparian Area Replanting

The purpose of this section is to discuss how planting will be managed to ensure that all successive vegetation is of optimal health and in accordance with planting plans provided by McElhanney. Topics of discussion may include long term monitoring, handling, and screening protocols to prevent accidental introduction of invasive plants.

## 9.10. Waste Management Plan

The purpose of this section is to outline the procedures for handling and disposing of waste materials generated during construction or uncovered by chance. An effective Waste Management Plan will reduce the flow of wastes to the landfill by recycling or reusing materials whenever feasible. Implement strategies that minimize the total amount of wastes generated by the project.

### 9.10.1. General Construction Waste

This section deals with principles pertaining to the proper storage of materials and handling and management of general wastes during site preparation and construction activities. Compile an extensive list of BMPs to manage non-hazardous solid waste generated by the project.

Refer to SS 165.14.01 *General Waste*: "The Contractor shall be responsible for the regular collection, storage, and disposal of all waste material generated by employees and subcontractors. The Contractor shall take the necessary precautions to prevent loss of these materials during transport on public highways and roads, and shall be responsible for cleanup of all materials and all litter deposited by employees and subcontractors along access routes during construction related activities, at no expense to MoTI. Construction debris shall not be allowed to accumulate on the construction site but shall be collected promptly, placed and stored in suitable animal-proof containers and disposed of at an approved waste disposal site."

### 9.10.2. Special or Hazardous Waste

The purpose of this section is to outline how hazardous materials used during the construction process will be stored and handled to avoid loss and to allow containment and recovery in the event of a spill in accordance with all applicable legislation and regulations.

Discuss protocols for disposing (include instructions for the preparation of waste tracking manifests) of and storing hazardous wastes generated during work activities that will follow all applicable regulations and acts. Create an inventory of all products which will be used during construction that are toxic to the environment. Hazardous wastes may include, but are not limited to, Asbestos Containing Materials, Polychlorinated Biphenyl containing materials, oils, greases, creosote treated materials, lubricants, solvents, Polyvinyl Chloride cements and primers, concrete and concrete wastes, cement grout, and used spill cleanup materials. hazardous material including Hazardous materials including “Dangerous Goods” (as defined under the *Transportation of Dangerous Goods Act (BC 1996a)*) and “Controlled Products” (as defined under the *Occupational Health and Safety Regulation (BC 1997)*) pursuant to the *Workers Compensation Act (BC 1996d)* used during the construction of a project will be stored and handled to avoid loss and to allow containment and recovery in the event of a spill in accordance with applicable legislation and regulations.

### 9.10.3. Hydrocarbon Products

This section is intended for the development of environmentally sound procedures which will be implemented as well as BMPs for refueling and/or transfer and storage of hazardous materials including petroleum products.

Refer to the following resources:

- **SS 165.14.05 *Petroleum Wastes***

“Solids, sludges and other pollutants generated as a result of construction or removed during the course of treatment or control of wastewaters shall be disposed of in a manner that prevents their direct or indirect discharge to any Watercourse or groundwaters.”

- **BC Field Guide to Fuel Handling, Transportation & Storage (2002)**
- **BC Fuel Guidelines, 8th Edition (2016)**

### 9.10.4. Concrete Materials Handling

Indicate in this section measures to manage concrete wastes for works involving concrete pours. Storm runoff or other water contact with curing concrete may produce highly alkaline (e.g. pH ~13) waste water which is extremely toxic to fish and other aquatic biota. Provide a specific list of BMPs for handling concrete laden water.

Refer to SS 165.14.04 *Concrete Wastes* for details pertaining to the proper handling and disposal of concrete wastes: “The Contractor shall ensure that carbon dioxide cylinders and suitable application devices are available on-site and ready for use in the carbonation of water columns to neutralize any concrete leachate that is inadvertently discharged into the Watercourse.”

### *CO<sub>2</sub> Diffuser Kits*

The purpose of this section is to direct construction personnel in the use and availability of CO<sub>2</sub> diffuser kits. In the event of a spill during concrete works, water pH levels can be neutralized by the use of a carbon dioxide CO<sub>2</sub> tank with a regulator, hose and gas diffuser. This is specifically relevant if the potential exists for water to come in contact with concrete fines, curing water, uncured concrete, and wash or contact water. Discuss the contents of the kit, regular inspection and maintenance, and staff competency in the event of an emergency.

Refer to SS 165.14.04 *Concrete Wastes*.

## **9.11. Soil Management Plan**

The primary objective of this section is to detail procedures for soil management, including temporary storage and removal (include the approved facilities in which contaminated soils may be taken). It may be helpful to reiterate items discussed in the ESCP regarding stabilization of soils. Management of excavated materials should also include proper handling procedures.

### 9.11.1. Native Soil Handling

The purpose of this section is to discuss how native soils (that are not suspected or exhibit characteristics of contamination) will be handled and managed by the Contractor. Refer to SS 165.06 *Stripping Operations* for further guidance.

### 9.11.2. Topsoil Salvage

The purpose of this section is to provide the Contractor with a written procedure for reusing topsoil within the project boundaries. Given the prevalence of invasive plant species, it is of the utmost importance that soils be carefully screened and treated. Provide a detailed plan outlining the methods which will be implemented for determining and handling salvageable topsoil. It is strongly recommended that all topsoil to be salvaged receive prior approval by both the EM and the MoTI Representative.

### 9.11.3. Chance-find Contaminated Soil Handling

Identify the likelihood of encountering contaminated soils based on current and historical uses of the project footprint. Develop a stringent protocol for the event of a chance find and outline BMPs which will be implemented to adequately contain contaminated soils to the site.

## 9.12. Air Quality & Dust Control Plan

The purpose of this section is to provide technical guidance to reduce the emission of fine particulate matter and greenhouse gases into the surrounding environment. An expansive list of specific BMPs must be provided which will be implemented to mitigate dust and preserve air quality.

Refer to 165.16.01 *Noise and Emissions* and 165.16.03 *Dust Control* for further guidance: “Dust control techniques may also be required by the MoTI Representative during other construction operations, including but not limited to demolition, drilling, sand blasting and concrete cutting.”

### 9.12.1. Idle Reduction

The purpose of this section is to discuss procedures which will be implemented to reduce greenhouse gas emissions. Further to SS 165.16.02, and 165.02.02, the Contractor’s CEMP shall include procedures outlining how drivers and equipment operators will be engaged in idle reduction practices. Consult the Main Works Tender Package for a list of components which must be considered in the Idle Reduction Plan.

## 9.13. Noise Management Plan

In this section, indicate mitigative practices to minimize noise and vibration generated by construction activities. Suggest measures which will prevent any unnecessary noise that may disrupt wildlife or inconvenience visitors or residents.

Refer to SS 165.16.01 *Noise and Emissions*: “All activities, equipment, processes and work operated or performed by the Contractor in accomplishing the specified construction shall be in strict accordance with Federal, Provincial and local regulations governing noise levels.”

Refer to the Tender document of the timing for construction to be compliant with MoTI standards and DNV Bylaws which prohibits construction noise outside the hours of 7AM to 8PM Monday to Friday, and 9AM to 5PM Saturday, with no work being carried out on Sundays and Statutory Holidays.

## 9.14. Spill Procedure & Mitigation Plan

Refer to SS 165.14.02 *Spill Contingency Plans*: “Contingency plans for the clean-up of toxic or hazardous spills shall be prepared prior to construction and submitted, together with a list of spill abatement equipment to be stored on the job site, to the MoTI Representative for review. Spill contingency plans may be a sub-plan to the CEMP.”

### 9.14.1. Spill Prevention

The purpose of this section is to specify spill prevention measures that will be employed to avoid or minimize potential contamination of the soil, groundwater, and surface water (overland flow). These BMPs should mitigate the likelihood of accidental release due to refueling and damaged equipment.

### 9.14.2. Spill Response Plan

The purpose of this section is to provide a systematic procedure which will be implemented should a spill of fuel, oils, PCB, lubricants, chemicals or other harmful substances occurs at a work site.

Produce a spill contingency plan that includes procedures, instructions, and reporting guidelines in the event of an unpredictable spill of a controlled substance. Provide resources for qualified professional should further technical assistance be required. State (preferably in the form of a table) substances and quantities that require external notification.

#### **Spill Response Steps**

1. SAFETY FIRST
2. STOP THE FLOW (when possible)
3. SECURE THE AREA
4. CONTAIN THE SPILL
5. NOTIFY / REPORT (EMBC 1-800-663-3456)
6. CLEAN UP

(Circumstances may dictate another sequence of events)

1. SAFETY FIRST
  - Ensure Personal, Public and Environmental Safety
  - Wear appropriate Personal Protective Equipment
  - Never rush in, always determine the product spilled before taking action
  - Warn people in immediate vicinity
  - Ensure no ignition sources are present if spill is of a flammable material
2. STOP THE FLOW (when possible)
  - Act quickly to reduce the risk of environmental impacts
  - Close valves, shut off pumps or plug holes/leaks, set containers upright
  - Stop the flow of the spill at its source
3. SECURE THE AREA
  - Limit access to spill area
  - Prevent unauthorized entry onto site
4. CONTAIN THE SPILL
  - Block off and protect drains and culverts
  - Prevent spilled material from entering drainage structures (ditches, culverts)
  - Use spill sorbent 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 as close to the source as possible
5. NOTIFY / REPORT

- Notify Contract Administrator or alternate of incident (provide spill details)
- When necessary the first external call should be made by an RT representative to (see spill reporting requirements):
- Provide necessary spill details to other external agencies (see spill reporting requirements)

6. CLEAN UP

9.14.3. Reportable Spill Quantity List

The purpose of this section is to provide the Contractor with a list of externally reportable quantities for substances. See the example provided below.

Table X. List of Externally Reportable Quantities for Commonly Used Substances

Product	Quantity
<b>Class 2.1</b> – flammable gas (e.g., propane)	10 kg or 10 min.
<b>Class 2.2</b> – nonflammable gas (e.g., SF6, CO2)	10 kg or 10 min.
<b>Class 3</b> – flammable liquids	100 L
<b>Class 8</b> – corrosive liquid acids and caustics (e.g., battery acid)	5 kg or L
<b>Class 9</b> – miscellaneous dangerous goods (e.g. friable asbestos)	1 kg or L
Oil, 2 or more ppm PCBs, <b>from</b> in-service equipment	containing 1 g pure PCB
Oil, 2 or more ppm PCBs, <b>not from</b> in-service equipment	Any quantity
Solids, 50 or more ppm PCBs, <b>not from</b> in-service equipment	Any quantity
Oil & Waste Oil (less than 2ppm PCBs)	100 L
Leachable toxic waste (e.g. abrasive blasting material, used antifreeze)	25 kg or L
Pesticides and herbicides	5 kg or L
Other substances (e.g. new antifreeze, power-wash water)	200 kg or L

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

Emergency Management BC **1-800-663-3456**

**\*\*\*ALL SPILLS TO STORM SEWER ARE REPORTABLE TO THE MUNICIPALITY\*\*\***

9.14.4. Spill Abatement Kits

The purpose of this section is to specify the location and contents of suitable spill abatement kits. This section should also detail the proper procedures for their use. Disposal and storage of used spill clean-up materials should be reiterated in this section. Outline an acceptable inventory to be contained within each kit.

## 9.15. Wildfire Management Plan

Under the BC *Wildfire Act* (Section 6) “a person who carries out a high-risk activity on or within 300 m of forest land or grassland on or after March 1 and before November 1, unless the area is snow covered,

must determine the Fire Danger Class for the location of the activity". Consult the Main Works Tender Package for a list of components which must be considered in the Wildfire Management Plan.

## 9.16. Archaeological Chance Find Management Plan

As per the Archaeological Impact Assessment (AIA) Interim Report (August 10, 2015), the likelihood for encountering previously unrecorded archaeological sites within the area covered by this report is considered low, and no further archaeological work is recommended. Should the Contractor encounter an archaeological site and/or artefact(s) during works within the assessment footprint, MoTI's Chance Find Management protocol will apply, as outlined in SS 165.20 (Appendix E). Furthermore, should the Contractor choose a staging area outside the limits of the AIA study, it shall be the Contractor's responsibility to undertake any additional archaeological investigations necessary, including permitting for any field investigations.

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## **Appendix A – Weekly Monitoring Report Template**

## **Appendix B – Environmental Incident Report Form**

## **Appendix C– DFO Authorization: 18-HPAC-XXXXX**

## **Appendix D – MOTI Bird Nesting Protocol**

## **Appendix E – Archaeological Chance Find Protocol**

## **Appendix F – Environmental Orientation/Training Record**