



VANCOUVER AIRPORT FUEL DELIVERY PROJECT

CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN

Prepared for:

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LIST OF ACRONYMS

BC	British Columbia
BMPs	Best Management Practices
CEMP	Construction Environmental Management Plan
DFO	Fisheries and Oceans Canada
EA	Environmental Assessment
EAC	Environmental Assessment Certificate
EAO	Environmental Assessment Office
EPC	Engineering, Procurement and Construction
EMBC	Emergency Management BC
EMP	Environmental Management Plan
EWP	Environmental Work Plan
PLAs	Permits, Licences and Approvals
PMV	Port Metro Vancouver
QEP	Qualified Environmental Professional
TOC	Table of Conditions
VAFFC	Vancouver Airport Fuel Facilities Corporation
VFPA	Vancouver Fraser Port Authority
YVR	Vancouver International Airport

DISTRIBUTION LIST

The following individuals/firms have received this document:

Name	Firm	Hardcopies	CDs	Email	FTP
Adrian Pollard	FSM Management Group Inc.	-	-	✓	-
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Angus Johnston	Hatfield Consultants	-	-	✓	-
Andrew Taylor	Port Metro Vancouver	-	-	-	-
Carolina Eliasson	Port Metro Vancouver	-	-	-	-

AMENDMENT RECORD

This report has been issued and amended as follows:

Issue	Description	Date	Approved by	
1	First version of CEMP	20150501		
2	Second version of CEMP	20150507		
			Garth Taylor Project Director	Angus Johnston Project Manager

1.0 INTRODUCTION

Vancouver Airport Fuel Facilities Corporation (VAFFC), a consortium owned by most of the major airlines serving Vancouver International Airport (YVR), plans to build a new aviation fuel delivery system to meet the future fuel requirements at YVR. The Vancouver Airport Fuel Delivery Project (the Project) is located in the City of Richmond, Lower Mainland, B.C. and includes development of a marine terminal and fuel receiving facility located on the South Arm of the Fraser River and a 13-kilometre underground pipeline to YVR.

In December 2013, the Project received environmental approval from the B.C. government and Port Metro Vancouver (acting on behalf of the federal government), following a comprehensive 5-year coordinated provincial and federal environmental assessment review process, which involved all relevant stakeholders, and public and Aboriginal consultations. That process concluded with the issuance of a joint provincial Assessment Report and federal Screening Report, provincial EAC with conditions (EAC # E13-02), and a federal Environmental Decision Statement also with conditions.

This Construction Environmental Management Plan (CEMP) has been prepared to help manage and mitigate potential environmental effects during construction of the fuel receiving facility and sections of new transfer and delivery pipelines that will be located on Vancouver Fraser Port Authority (VFPA trading as Port Metro Vancouver (PMV)) land. The CEMP has been prepared to meet PMV's Project Permit Application Submission Requirements issued for the "*Vancouver Airport Fuel Delivery Project – Aviation Kerosene Fuel Receiving Facility and Sections of New Transfer and Delivery Pipelines that will be Located on Port Metro Vancouver Land*", and to meet the relevant conditions of the provincial government's environmental assessment certificate (EAC).

The fuel receiving facility and sections of piping will be developed on land to be leased from PMV. The site location is presented in Figure 1. Before construction activities can begin, ground improvements are required to provide suitable ground conditions. The ground improvements will include site preparation, soil excavation and replacement, and ground densification. Facility construction will include the new tank foundation bases, tanks and dyke, processing facilities and sections of piping, road access, containment areas and the associated ancillary facilities. From start to finish, construction of the fuel receiving/storage facility and sections of new transfer and delivery pipelines that will be located on PMV land is expected to take approximately 30 to 36 months to complete (approximately 12 months to complete the ground improvements and an additional 18 to 24 months to complete the facility and piping).

The CEMP is based on information presented in VAFFC's application for a Project EAC, including recommended mitigation measures, Best Management Practices (BMPs), the EAC Table of Conditions (TOC) (refer to Appendix A1), and PMV's Environmental Assessment Decision Statement and associated conditions. The CEMP also incorporates initial detailed design information which has been completed following receipt of the EAC. The CEMP is a live and evolving document that will be reviewed and revised prior to the start of facility construction works as further detailed design information is confirmed.

Figure 1 Site location.

Insert Figure 1

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CEMP\VAFFC6773_Project_Site_20150507_SB_AMD.pdf

1.1 PROJECT DESCRIPTION

1.1.1 Overall Project Description

The Project includes:

- Upgrades and modifications to the marine terminal wharf;
- Construction and operation of facilities at the marine terminal to off-load and transfer fuel from vessels;
- Construction and operation of the fuel receiving facility;
- Construction and operation of the pipeline to transfer off-loaded fuel from the marine terminal to the fuel receiving facility; and
- Construction and operation of the pipeline to deliver fuel from the fuel receiving facility to VAFFC's fuel facilities at YVR.

Details for each of the Project components, including locations, characteristics and mapping, are included in the Certified Project Description (refer to Schedule A of the EAC).

1.1.2 Project Description for Works on PMV Lands

Upon occupancy of the site, a number of processes must be undertaken to prepare and strengthen the ground below and surrounding the future structures to meet settlement and seismic performance parameters. Once ground improvements are completed, construction of the facility will begin. VAFFC's marine terminal property will be used for material receipt, storage and transfer, laydown areas and other construction related activities.

Project activities will include:

- Site Preparation:
 - Setting up staging areas, temporary lighting, fencing, construction security measures and other services;
 - Installing perimeter drainage and sediment control systems; and
 - Removing, disposing and replacing unsuitable sub-base materials to varying depths depending on the surface structures.
- Ground Improvement:
 - Densifying the ground up to a depth of 20 meters using stone columns in areas of critical infrastructure such as tanks and processing areas.
- Facility Construction:
 - Trenching and excavation to accommodate underground services and structures, including electrical, water, telecommunication, sanitary sewer, surface water drainage, oil/water separator system, and the incoming and outgoing pipelines;

- Access road construction, including paving for inner perimeter road, parking and walkways, grading and compaction of fill, and import and compaction of crushed gravel. Asphalt or concrete may be used for covering certain access roads;
- Installation of concrete tank foundations, including curing of the concrete, hauling of forms, steel and concrete;
- Construction of the fuel receiving tanks, including delivery of welded plate steel to site, welding of steel plates, leak testing, sand-blasting and epoxy painting;
- Installation of perimeter dike and secondary containment system, including installation of perimeter drainage, impermeable liner, dike structures, and an oil/water separator system;
- Construction of process, transfer and operations areas, including pump and filter area, fuel quality testing station, operations building, storage sheds, parking areas, backup generator building, fire protection and response systems, and fencing; and
- Landscaping and planting.

1.1.3 Project Implementation Schedule

Site preparation and ground improvement activities are anticipated to start in summer 2015. A general Project implementation schedule for the works on PMV land is provided in Table 1. This schedule is to be considered preliminary and will be updated periodically as the Project implementation progresses.

Table 1 Estimated project schedule.

Task Description	Timeline									
	2015		2016				2017			
	Quarter 3	Quarter 4	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Quarter 1	Quarter 2	Quarter 3	Quarter 4
Site Preparation	■	■	■							
Ground Improvements			■	■						
Facility Construction			■	■	■	■	■	■	■	■
Facility Commissioning										■

1.2 CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN

1.2.1 Objectives of the CEMP

This CEMP is the primary document to guide overall environmental management practices to be implemented during Project construction. The general objectives of the CEMP are to:

1. Protect valued components, including socioeconomic features within the Project area;
2. Guide compliance with environmental legislation and regulations, conditions of environmental permits, licences and approvals (PLAs) from regulatory agencies, and all environmental conditions specified in the EAC and PMV Environmental Assessment (EA) Decision Statement; and
3. Reduce potential environmental liabilities.

The purpose of the CEMP is to provide information on how to avoid and mitigate the potential adverse environmental effects identified and assessed in the EAC Application (Application) and through the Application review period. The TOC as defined by the British Columbia Environmental Assessment Office (EAO) and PMV's Environmental Assessment Decision Statement Conditions are provided in Appendix A1 and Appendix A2, respectively.

The CEMP will provide environmental guidance to the VAFFC Project Team who will in turn require the Engineering, Procurement and Construction (EPC) Contractor and their Environmental Team to follow the CEMP requirements during construction. Additionally, the CEMP serves to address issues and concerns brought forward during the EA process by the EAO, PMV, regulatory agencies, First Nations, and the public. The strategies outlined in the CEMP are intended to guide the contractors in their preparation and implementation of detailed site/activity-specific Environmental Work Plans (EWPs). VAFFC is ultimately responsible for ensuring all conditions of the EAC and mitigation measures in the CEMP are fulfilled.

No construction or physical work shall be performed before the CEMP has been approved for use by the EAO and PMV. Furthermore, no construction or physical work shall proceed on site prior to review and acceptance of the EWPs by VAFFC's Environmental Manager.

1.2.2 Scope of the CEMP

The CEMP will be updated as required to verify continual improvement and continued relevance during construction. Updates to the CEMP will be submitted to relevant First Nations, the EAO and PMV in a timely manner if requested.

In addition to the general environmental protection and management provisions, the CEMP includes a number of stand-alone discipline-specific Environmental Management Plans (EMPs), which address specific issues and mitigation measures. The CEMP EMPs, as required by the TOC (EAC, Schedule B, Condition No.1), address discipline-specific environmental issues that may threaten valued components, for example waste management, and noise management. The CEMP also includes the Traffic Management Plan required by EAC Schedule B Condition No. 2, and the Groundwater Management Plan required by the PMV EA Decision Statement Conditions. The EMPs provide guidance for implementation of mitigation measures and are listed in Table 2. The EMPs are summarized in Section 3.2 and provided in their entirety in Appendices A3 to A14.

The CEMP addresses the activity and/or site specific EWPs that will be prepared by the contractor(s) prior to the start of site activities. It is not the purpose of this document to present, discuss or assess all Project effects, as this was addressed during the coordinated provincial and federal environmental assessment review process.

Table 2 CEMP environmental management plans and the potential effects addressed.

Environmental Management Plan	Potential Effects Addressed
Accidents or Malfunctions Management Plan	<ul style="list-style-type: none"> ▪ Introduction of deleterious substances into fish and fish habitat; ▪ Impacts to human health from improper handling and/or storage of hazardous substances; ▪ Accidents during construction; ▪ Worker safety; ▪ Demand for emergency services; and ▪ Interruption of services.
Air Quality and Dust Control Management Plan	<ul style="list-style-type: none"> ▪ Sensory disturbance; ▪ Water quality degradation; and ▪ Impacts to human health.
Archaeological Management Plan	<ul style="list-style-type: none"> ▪ Chance Find sites.
Contaminated Sites Management Plan	<ul style="list-style-type: none"> ▪ Soil disturbance and compaction; ▪ Introduction of deleterious substances into fish and fish habitat; and ▪ Changes to ecosystems.
Fuels, Chemicals and Materials Storage and Handling Plan	<ul style="list-style-type: none"> ▪ Introduction of deleterious substances into fish and fish habitat; ▪ Changes to ecosystems through improper disposal of hazardous or solid waste; ▪ Wildlife interactions resulting from improper use and/or storage of attractants; and ▪ Impacts to human health from improper handling and/or storage of hazardous substances.
Noise Management Plan	<ul style="list-style-type: none"> ▪ Sensory disturbance; and ▪ Auditory disturbance.
Spill Prevention and Emergency Response Plan	<ul style="list-style-type: none"> ▪ Introduction of deleterious substances into fish and fish habitat; ▪ Changes to ecosystems; and ▪ Water quality degradation.
Surface Water Quality/Fisheries Protection and Sediment Control Plan	<ul style="list-style-type: none"> ▪ Water quality degradation; ▪ Introduction of deleterious substances into fish and fish habitat; and ▪ Water flow changes from vegetation losses.
Vegetation and Wildlife Management Plan	<ul style="list-style-type: none"> ▪ Soil disturbance/compaction; ▪ Vegetation/habitat loss or fragmentation; ▪ Introduction of invasive species;

Table 2 (Cont'd.)

Environmental Management Plan	Potential Effects Addressed
Vegetation and Wildlife Management Plan Cont'd.	<ul style="list-style-type: none"> ▪ Water flow changes from vegetation losses; Auditory disturbance; ▪ Sensory disturbance; ▪ Road Mortality; ▪ Disruption of movement patterns; and ▪ Changes to habitat availability.
Waste Management Plan	<ul style="list-style-type: none"> ▪ Changes to ecosystems through improper disposal of hazardous or solid waste.
Groundwater Management Plan	<ul style="list-style-type: none"> ▪ Introduction of deleterious substances into fish and fish habitat; ▪ Water quality degradation; and ▪ Changes to ecosystems.
Traffic Management Plan	<ul style="list-style-type: none"> ▪ Disturbances to public in the vicinity; ▪ Increase in traffic; and ▪ Changes to air quality.

1.2.3 CEMP Review and Modification

Periodic modifications or supplements to the CEMP may be made as deemed necessary, and at a minimum annually, to capture design elements and work progress, verify the ongoing compliance with environmental legislation and regulations, EAC conditions, permitting requirements, BMPs and other project environmental documents. Changes to the CEMP may also result from the following:

- A change in law;
- Any lawful order by a Governmental Authority;
- The need to incorporate the terms of any Permit;
- Changes to the Project work schedule, Project work or Facility conditions; and/or
- Any weather-dependent contingency.

Opportunities to improve the CEMP will also be assessed following the occurrence of any environmental incident reported to an environmental authority under any environmental law or permit. All modifications, supplements, and amendments to the CEMP will be submitted to the EAO and PMV, and must be reviewed and accepted by the Environmental Manager. Significant changes to the CEMP and associated EMPs may also be subject to review and comment by the regulatory agencies, depending on the nature of the changes proposed.

It is the responsibility of key Project personnel (outlined in Section 3.1) to be knowledgeable on the content of the CEMP, and to verify that the most recent copy of the CEMP is in use.

2.0 ENVIRONMENTAL OBLIGATIONS

All Project construction-related works will be completed in compliance with applicable legislation, guidelines and conditions, as outlined in:

- Relevant environmental legislation and regulations;
- All Project-related permits, licences, approvals and authorizations;
- Relevant policies, guidelines and BMPs established by regulatory agencies;
- The conditions contained in the EAC; and
- The conditions contained in PMV EA Decision Statement.

2.1 RELEVANT LEGISLATION

Environmental legislation applicable to the Project includes:

Federal

- Canadian Environmental Assessment Act;
- Canadian Environmental Protection Act;
- Canada Water Act;
- Fisheries Act;
- Hazardous Products Act;
- Migratory Birds Convention Act;
- National Fire Code of Canada;
- Pest Control Products Act;
- Seeds Act;
- Species at Risk Act;
- Transportation of Dangerous Goods Act;
- Wild Animal and Plant Protection and Regulation of International and Inter-Provincial Trade Act;
and
- Wildlife Act.

Provincial

- BC Fire Code;
- Community Charter – Environment and Wildlife Regulation;

- Contaminated Sites Regulation;
- Emergency Program Act;
- Environment and Land Use Act;
- Environmental Management Act;
- Fire Services Act;
- Fish Protection Act;
- Hazardous Waste Regulation;
- Heritage Conservation Act;
- Integrated Pest Management Act;
- Public Health Act ;
- Spill Reporting Regulation;
- Transportation Act;
- Transportation of Dangerous Goods Act;
- Transportation of Dangerous Goods Regulation;
- Waste Discharge Regulation;
- Water Act;
- Weed Control Act;
- Wildlife Act;
- Wildfire Act; and
- Worker's Compensation Act.

Municipal/Regional

- City of Richmond Noise Regulation Bylaw No. 8856;
- City of Richmond Pollution Prevention and Clean-Up Bylaw No. 8475, 2009;
- City of Richmond Solid Waste & Recycling Regulation Bylaw No. 6803, 2015;
- Greater Vancouver Regional District Air Quality Management By-law No. 1082, 2008;
- Greater Vancouver Regional District Non-Road Diesel Engine Emissions Regulation Bylaw No. 1161, 2012; and
- Greater Vancouver Sewerage and Drainage District Sewer Use Bylaw No. 299, 2007.

2.2 PERMITS, LICENCES, APPROVALS AND AUTHORIZATIONS

Environment-related PLAs will be required for specific Project construction-related activities. All required environmental PLAs, including permits, will be in place and valid prior to conducting works for which a PLA applies, and all works will comply with the standards, practices, requirements, terms and conditions of all PLAs issued. VAFFC/FSM Management Group will be responsible for satisfying all PLA requirements. Table 3 provides a summary of the key PLAs applicable to the Project.

Table 3 Summary of permits, licences and approvals.

Agency	Statute	Permit/License/Approval	Status
DFO	Fisheries Act	Authorization	Authorization not required
DFO	Fisheries Act	Notification	May be required for stream/ditch crossings
Environment Canada	<i>Migratory Bird Convention Act</i>	A permit must be issued for all activities disturbing the nests or eggs of migratory birds	TBD following pre-construction surveys
MFLNRO	<i>Heritage Conservation Act</i>	Inspection Permit for archaeological investigation	Permit application was submitted to MFLNRO in April 2015
MFLNRO	<i>Heritage Conservation Act</i>	Alteration Permit for disturbance of an archaeological site	TBD during construction
MFLNRO	<i>Water Act</i>	Section 9 Notification required for culvert installations and other stream crossings.	May be required for stream/ditch crossings
MOE	<i>Environmental Management Act</i>	Waste Management Permit	Not anticipated
MOE	<i>Integrated Pest Management Act</i>	Licence for sale or use of pesticides	TBD during construction/operations if required for invasive species management
MOE	<i>Wildlife Act</i>	Bird salvage and handling permit	May be required for activities such as bird nest removal or relocation or wildlife salvages. Wildlife permit for amphibian salvage was applied for in April 2015.

DFO – Fisheries and Oceans Canada.

MFLNRO – Ministry of Forests, Lands and Natural Resource Operations.

MOE – Ministry of Environment.

2.3 ENVIRONMENTAL GUIDANCE DOCUMENTS AND BEST MANAGEMENT PRACTICES

All works will comply with BMPs. A comprehensive list of guidance documents and BMPs relevant to Project works is provided in the EMPs appended to this document. Regulatory agency policies, guidelines and documents are subject to change from time-to-time, and it will be the responsibility of VAFFC to verify that the most up-to-date versions are being followed. The least risk timing windows for fish and wildlife species are provided in the Vegetation and Wildlife Management Plan (Appendix A11).

2.4 EAC AND PMV CONDITIONS

VAFFC shall comply with all statutory requirements, the terms and conditions of all PLAs, and the EAC and PMV EA Decision Statement conditions. Applicable requirements of the EAC and PMV EA Decision Statement conditions are outlined in this CEMP. Additional monitoring and reporting requirements may be outlined in the conditions of PLAs obtained prior to and during Project works and shall be adhered to during all phases of the Project.

2.5 VALUED COMPONENTS

A comprehensive Application for an EAC (Application) was prepared by VAFFC in accordance with requirements of the *British Columbia Environmental Assessment Act* and *Canadian Environmental Assessment Act*. The Application identified and assessed potential effects of the proposed Project on environmental, social, economic, health and heritage components as well as First Nations' rights and treaty rights for all Project phases. The Application identified the following valued components and/or discipline areas that have the potential to be affected by the Project and Project-related activities:

- Fisheries, aquatics and surface water quality;
- Vegetation, wildlife and wildlife habitat;
- Air quality and climate;
- Noise;
- Soil and groundwater quality (contaminated sites);
- Economic;
- Social;
- Heritage and archaeology;
- Health;
- Impacts of accidents and malfunctions;
- Navigable waters and navigation;
- Impacts of the environment on the project;
- Cumulative impacts; and
- First Nations.

There were no sensitive ecosystems and habitats identified within the fuel receiving facility Project works area. Further information detailing the locations of valued components is provided in the Application.

2.6 POTENTIAL ENVIRONMENTAL EFFECTS

With appropriate mitigation and management of Project-related activities, effects on the environment are expected to be short in duration and reversible. Environmental effects will be avoided where practicable and BMPs and mitigation measures implemented to minimize effects that cannot feasibly be avoided. Potential environmental effects that may result from Project construction activities include the following:

- The release of sediment and other deleterious substances into fish-bearing waters and/or waters that flow directly into fish-bearing waters due to activities associated with site clearing and excavation, leading to water quality, and fish and fish habitat concerns;
- Air quality and dust management issues due to soil excavation, stockpiling, vehicle and equipment operations, transport of materials, and other construction activities producing deleterious air emissions and/or fugitive dust;
- Noise management issues resulting from machinery working on site;
- Fuel, oil or chemical spills (including hydrocarbons);
- Environmental emergencies including fire, road failures, motor and/or construction vehicle accidents, and equipment malfunctions;
- Disturbance and transportation of contaminated materials;
- Aquatic habitat degradation through pollution, including sedimentation from stockpiles and surface runoff during construction works;
- Removal of native plant species;
- Introduction and spread of invasive species;
- Loss and disturbance of wildlife habitat or changes to ecosystems;
- Direct wildlife mortality;
- Soil and groundwater contamination;
- Threats to wildlife and human health and safety due to improper storage, handling and management of wastes;
- Traffic management issues due to construction vehicles using the public road system; and
- Disturbance of archaeological resources.

2.7 ENVIRONMENTAL SURVEY REQUIREMENTS

Wildlife surveys shall take place in the appropriate seasonal and biological time and as appropriate for the construction activity. A list of anticipated surveys are presented in Table 4.

Surveys shall be scheduled by a QEP with the relevant expertise for the subject matter and for the suitable seasonal period. The specific details of the surveys including the time schedule, methods, spatial extent and standards are provided in the component EMPs appended to the CEMP.

Table 4 Anticipated environmental survey schedule.

Task	Anticipated Field Dates
Field Program #1	
Frog Survey	
Pacific Water Shrew Habitat Assessment	Late March/Early April 2015
Rare/At-Risk Plant Survey	
Field Survey Report	
Field Program #2	
Toad Survey	
Beaverpond Baskettail Survey	Mid/Late May 2015
Early-Flowering Rare Plant Survey	
Field Survey Report	
Field Program #3	
Songbird Survey	
Bird Nest Survey	
Raptor Nest Surveys*	June 2015
Autumn Meadowhawk Survey	
Late-Flowering Rare Plant Survey	
Field Survey Report	
Field Program #4	
Surface Water Quality Monitoring	June 2015

*Including determining the status of the bald eagle nest 124 m southwest of the marine terminal.

2.7.1 Archaeological Surveys

An Archaeological Overview Assessment has already been conducted for the Project. Areas on PMV land that have been identified as having "medium" to "high" potential for encountering archaeological resources shall be subject to an Archaeological Impact Assessment during Project works. A chance find protocol, along with a discussion of potential archaeological resources that may be encountered during construction, are discussed further in the Archaeological Management Plan (Appendix A5).

3.0 ENVIRONMENTAL MANAGEMENT

The environmental management procedures and protocols that will be adopted by VAFFC and its contractors and subcontractors to identify and manage risk include the following components:

- A qualified Environmental Management Team (described in Section 3.1);
- Preparation and implementation of CEMPs and discipline specific EMPs;
- Environmental monitoring and auditing;

- Environmental reporting;
- Environmental permitting;
- Environmental communications – internal and external coordination and liaison;
- Environmental training and awareness; and
- Document and data management.

3.1 ENVIRONMENTAL PERSONNEL

The Project Environmental Personnel include the following discipline professionals:

- VAFFC Environmental Manager;
- Contractor’s Environmental Monitor (EM); and
- Environmental Specialists, as required.

VAFFC shall be responsible for ensuring that the Project is constructed in compliance with environmental conditions provided in the EAC TOC and PMV TOC. It is the role of VAFFC’s Environmental Manager to convey these environmental constraints to the Contractor. Environmental Personnel will have direct input into activities that have the potential to impact the environment. Environmental personnel will participate in team meetings as required, and they will inspect, evaluate and report on construction activities and the effectiveness of environmental control strategies and mitigation measures, with respect to regulatory PLAs, environmental legislation and BMPs.

A description of the roles and responsibilities of the Project’s Environmental Personnel is provided below.

3.1.1 VAFFC Environmental Manager

Hatfield Consultants (Hatfield) has been retained by VAFFC as the Environmental Manager for the Project to oversee and manage all Project environmental-related matters on behalf of VAFFC. The Environmental Manager shall be responsible for establishing and ensuring proper implementation of the CEMP, and for auditing and reporting on the performance of the Project works as they relate to the CEMP, environmental laws, the terms and conditions of all PLAs issued under environmental laws, and environmental reference documents. The Environmental Manager shall be a Registered Professional Biologist in good standing with the College of Applied Biology of BC or other appropriate professional body, with relevant experience managing environmental issues in the design, construction and operation of large infrastructure projects. The Environmental Manager shall act only within his or her area of expertise; additional experts may be consulted for issues that may arise that are outside the Environmental Manager’s expertise to fulfill the objectives of this role.

Environmental specialists that may be consulted to assist with verifying compliance of the Project with the Project environmental obligations include:

- Wildlife and vegetation ecologist;
- Water quality specialist;

- Archaeologist;
- Contaminated sites specialist; and
- Environmental permitting specialist.

The Environmental Manager shall demonstrate a working knowledge of the site and be knowledgeable of the status of the Project work and all environmental issues and conditions associated with the Project, the Project Work and the Facility.

The Environmental Manager's key responsibilities include:

- Directing all aspects of the environmental program for the Project Work, including conducting periodic environmental audits at the Project site;
- Verifying that all works are carried out in compliance with the Environmental Obligations as set out in the EAC, PMV Decision Statement, environmental legislation, PLAs and BMPs;
- Overseeing preparation and submission to EAO and PMV of all reports required under the CEMP and all other reports required under the EAC and the PMV Decision Statement;
- Establishing and maintaining working relationships with VAFFC, the contractors and relevant Environmental Authorities and stakeholders;
- Review of the EM's monthly and annual environmental monitoring reports;
- Taking the lead role in internal environmental design reviews including development of mitigation and compensation proposals acceptable to VAFFC and Environmental Authorities;
- Reporting documented invasive species to the Invasive Plant Council of BC; and
- Liaising with VAFFC and the EM and acting as the single point representative for all matters relating to environmental management.

The Environmental Manager shall have the authority to halt construction activity and issue a Stop Work Order if work fails to meet environmental requirements as described in the CEMP, EMPs, EWPs, environmental approvals and permit conditions, legislation, regulations and Best Management Practices, or that, in the Environmental Manager's professional judgment, represents significant risk to the environment.

3.1.2 Contractor(s) Environmental Monitor

The primary role of the contractor(s) EM shall be to prepare and implement the various site and/or activity specific EWPs based on this CEMP, provide environmental training and awareness to all site personnel, and monitor and report on the effectiveness of mitigation measures during the Project works. The EM shall be an applied scientist or technologist with relevant experience in EWPs, environmental training and monitoring. The EM shall be registered and in good standing in BC with the College of Applied Biology of BC or other appropriate professional body that is governed by an Act and acting under that association's code of ethics and subject to disciplinary action by that association. The EM shall act within his or her area of expertise at all times, consulting with other qualified individuals in the event that situations arise that fall outside the EM's area of expertise.

The EM is responsible for overseeing the successful implementation of the CEMP, including tracking whether Project works comply with the CEMP, the EMP's and environmental permits as well as with more general environmental legislation and regulations. Site visits will include routine checks with effort increased in response to increased environmental sensitivity (e.g., proximity to sensitive areas, deteriorating weather and terrain conditions or higher risk construction activities). In addition to tracking environmental compliance and facilitating resolution of identified environmental issues, the EM will work proactively to identify and communicate potential environmental non-compliance to construction personnel and to reach agreement with them on appropriate preventive or corrective actions.

The EM will bring about correction of environmental deficiencies by working with construction personnel and/or through construction supervisors. After identifying an environmental deficiency, the EM will discuss appropriate corrective measures with construction personnel, obtain a commitment and plan from the personnel to correct the deficiency, and document progress in deficiency correction. The EM will track that deficiencies are corrected within a reasonable time frame.

Typically the EM will perform the following tasks throughout the duration of the Project:

- Review and understand the CEMPs, EMPs, Project authorizations, agency guidelines and other documents;
- Prepare EWP's based on the CEMP and EMP requirements;
- Review Contractor work plans to confirm that the conditions of the CEMP, EMPs and EWPs are met and to make recommendations to address any deficiencies;
- Establish and maintain working relationships with the contractors;
- Attend Project meetings;
- Advise the VAFFC construction officer that a work stoppage is necessary if environmental protection is compromised;
- Provide environmental orientation instruction to personnel;
- Monitor all waste management initiatives and report whether properly addressed as identified in the Waste Management Plan;
- Review and monitor implementation of drainage, erosion and sediment control plans in accordance with the Surface Water Quality, Fisheries Protection and Sediment Control Plan;
- Inventory contents of emergency spill response kits, and confirm if they are appropriately stocked and maintained in accordance with the Spill Prevention and Emergency Response Plan;
- Monitor site machinery for leaks;
- Observe, document and report spill cleanup;
- Review contractor cleanup and restoration activities;
- Monitor contractor work activities as required;
- Contact the Environmental Manager in the event of an environmental incident or development of unforeseen site conditions with potential for serious environmental degradation;

- Conduct sampling and assessments (e.g., water quality samples) as necessary to prevent (if possible) and record (if unpreventable) impacts to environmental resources;
- Maintain detailed Project records, including environmental incident reports, daily diaries and photographs;
- Conduct a de-briefing meeting with the construction officer at the end of each week to clearly outline any work or procedures that increase environmental risk and how the risks may be mitigated; and
- Prepare monthly Environmental Monitoring Reports.

The EM has the authority to halt construction activity and issue a Stop Work Order if work fails to meet environmental requirements as described in the CEMP, EMPs, EWPs, environmental approvals and permit conditions, legislation, regulations and Best Management Practices, or that, in the EM's professional judgment, represents significant risk to the environment.

The EM will make recommendations to resume work once the causes leading to the Stop Work Order have been identified, addressed, controlled, and the environmental risks have been reduced or eliminated. Work will be allowed to resume once conditions detrimental to the environment have been rectified to the satisfaction of the EM, the Environmental Manager and VAFFC.

3.1.3 Organizational Chart

The organizational structure of the Environmental Management Team is shown in Figure 2.

Figure 2 Organizational chart.



3.1.4 Project Contacts

Table 5 provides a list of key Project contacts related to environmental management and safety. This list will be updated periodically to reflect any changes in contacts or contact information.

Table 5 Project contacts.

Name	Responsibility	Contact Information
Project Team		
Adrian Pollard	Project Director	1-604-271-7113
Mark McCaskill	Project Manager	1-604-271-7113
Angus Johnston	Environmental Manager	1-604-926-3261
Ralph Eastman	Project Communications	1-604-684-6655
Project Contractor(s)		
TBD	Construction Site Manager	TBD
TBD	Environmental Monitor/Coordinator	TBD
Agencies		
Emergency Management BC	Spill Reporting	1-800-663-3456
Fisheries and Oceans Canada	Spill Reporting	1-866-845-6776
RCMP	Emergency Services	911
Richmond RCMP Detachment	Emergency Services	604-278-1212
Fire	Emergency Services	911
Richmond Fire-Rescue	Emergency Services	604-278-5131
Ambulance	Emergency Services	911
Richmond Hospital	Emergency Services	604-278-9711

3.2 ENVIRONMENTAL MANAGEMENT DOCUMENTS

This CEMP and corresponding discipline-specific EMPs have been developed to guide the environmental management of the Project, with a focus on the works required to develop the fuel receiving facility and associated sections of pipeline. The CEMP and associated EMPs will be further supplemented by EWPs, which will be prepared by the Contractor, following confirmation of work activities and will detail site-specific measures to be undertaken for Project-related works and/or provide a specific set of guidelines for mitigating potential impacts.

3.2.1 Environmental Management Plans

The discipline-specific EMPs are summarized below and provided in their entirety in Appendices A3 to A14.

3.2.1.1 Accidents or Malfunctions Management Plan

The Accidents or Malfunctions Management Plan (Appendix A3) identifies potential malfunctions or accidents that may reasonably occur in connection with the construction of the Project. Accidents or malfunctions are defined as those events which may be caused by human error, deliberate action (e.g., vandalism) or wildlife, and may result in adverse environmental effects. The Plan provides procedures for responding to situations that pose an imminent or potential threat to environmental resources or human health. The measures contained in the Plan will minimize adverse effects to

terrestrial and aquatic environments and improve the safety of the workers and public. Measures to control health and safety risks to workers and the general public are outlined, including fencing, signage and security. Emergency response procedures in the event of a health and safety-related incident are also described.

3.2.1.2 Air Quality and Dust Control Management Plan

The Air Quality and Dust Control Management Plan (Appendix A4) describes construction-related activities for the Project with the potential to impact air quality and/or generate dust. It outlines the measures to control fugitive dust and other airborne emissions associated with vehicle and equipment operation, demolition and/or decommissioning of existing structures, stockpiling of soils, and other construction activities. Commitments to comply with any applicable permits, approvals and authorizations, laws or regulations associated with air quality are provided, and reference made to any applicable prohibitions, such as to burning of refuse or use of chemical dust suppressants, unless otherwise authorized. Implementation of the plan will mitigate impacts to surrounding vegetation and wildlife, as well as to workers and the general public.

3.2.1.3 Archaeological Management Plan

The Archaeological Management Plan (Appendix A5) describes strategies to address archaeological management, including identification of additional assessment requirements for the Project and applicable mitigation measures. Archaeological monitoring requirements are also identified, based on the findings of the heritage resource overview assessment. Permit requirements under the *Heritage Conservation Act* and monitoring procedures based on the B.C. Archaeological Resource Management Handbook and B.C. Archaeological Impact Assessment Guidelines are also described.

3.2.1.4 Contaminated Sites Management Plan

The Contaminated Sites Management Plan (Appendix A6) describes the potential for soil contamination issues that may be encountered during construction (e.g., during excavation activities) and/or contamination that may occur as a result of construction activities (e.g., due to fuel spills or leaks). The steps involved in determining the need for and, as necessary, completing and submitting an application for a Contaminated Soil Relocation Agreement are described. Measures are specified to verify that imported fill brought onto Project work sites is obtained from a reputable supplier and comes with a certificate of source and quality compliance to ensure it is clean and conforms to the appropriate land use criteria established in the Contaminated Sites Regulation under the *Environmental Management Act*. Measures are also specified to verify that imported fill brought onto Project work sites does not enter into the receiving environment, including watercourses, wetlands, or stormwater systems. Provision for a sampling program to identify the chemical composition of all soils material to be excavated and removed from work sites is also provided.

3.2.1.5 Fuels, Chemicals and Materials Storage and Handling Plan

The Fuels, Chemicals and Materials Storage and Handling Plan (Appendix A7) describes construction-related activities and materials for the Project with the potential to result in spills or risks to human health and the environment. The purpose of the Plan is to describe the typical strategies for

managing fuels, chemicals and other materials, and controlling spills or risks to human health and the environment in the vicinity of the Project construction site. These strategies are intended to guide the construction contractor's Environmental Monitor in their preparation and implementation of detailed site/activity-specific environmental protection plans or work plans. Information is provided on the recommended processes for handling, storage, transportation and final disposal of these materials. Monitoring and reporting requirements are also described. Implementation of this Plan and the detailed site/activity-specific plans will minimize the potential for adverse effects to a variety of resources as a result of fuels, chemicals and other materials on site.

3.2.1.6 Noise Management Plan

The Noise Management Plan (Appendix A8) describes construction-related activities for the Project with the potential to generate noise emissions. Commitments to comply with applicable permits, approvals and authorizations, laws or regulations associated with noise are detailed, including the City of Richmond's Noise Bylaw. Noise control requirements are identified and described. These may include: maximum allowable noise emissions from equipment and machinery, allowable hours of work, requirements for communication with the public regarding any construction noise issues that may arise, and procedures for responding to any noise complaints. Noise mitigation measures and BMPs to be implemented during the construction phase to address potential adverse effects are described. Details of noise monitoring and reporting requirements are also provided.

3.2.1.7 Spill Prevention and Emergency Response Plan

The Spill Prevention and Emergency Response Plan (Appendix A9) identifies any potential environmental emergencies related to the loss of hydrocarbon-based or other hazardous or deleterious materials that could arise during construction. The plan will also touch on other emergency response protocols for incidents such as fire and flooding. This Plan will identify rapid, safe and effective responses to be implemented in the event of fire, a spill, or other environmental incident during construction. The Plan will reflect information presented in the B.C. Guidelines for Industry Emergency Response Plans (Ministry of Environment 2002) and the Canadian Standards Association (CAN/CSAZ73 I-03) Emergency Planning for Industry (2003). In addition, the Spill Prevention and Emergency Response Plan is consistent with the "Flood Planning and Response Guide for British Columbia", the Emergency Program Management Regulation and the *Dike Maintenance Act* (Ministry of Environment 1999). Key components of the Plan are pre-emergency planning, emergency organization and responsibilities, incident reporting, emergency response, site restoration and remediation. Implementation of the Plan will minimize adverse effects to terrestrial and aquatic environments and improve the safety of the workers and public.

3.2.1.8 Surface Water Quality/Fisheries Protection and Sediment Control Plan

The Surface Water Quality, Fisheries Protection and Sediment Control Plan (Appendix A10) describes construction-related activities for the Project with the potential to impact water quality and/or fish or fish habitat. Recommended mitigation is provided for protecting surface water quality and/or fish or fish habitat, and controlling the release of sediments. The purpose of the Plan is to describe the typical strategies for mitigating and managing surface water quality and controlling the release of sediments to watercourses in the vicinity of the Project construction site. These strategies are intended to guide the construction contractor's Environmental Monitor in their preparation and implementation of detailed

site/activity-specific environmental protection plans or work plans. Monitoring and reporting requirements are also described. Implementation of this Plan and the detailed site/activity-specific plans will minimize the potential for adverse effects to a variety of resources, including water quality, fish and fish habitat, vegetation and wildlife.

3.2.1.9 Vegetation and Wildlife Management Plan

The Vegetation and Wildlife Management Plan (Appendix A11) describes construction-related activities for the Project with the potential to impact vegetation and wildlife. It outlines the methods for preventing adverse environmental effects to vegetation and wildlife during construction, and the monitoring and reporting requirements. Field surveys required prior to construction are described and strategies for minimizing effects to vegetation, wildlife and water courses during site preparation and planning shall be developed. Management measures for preventing the introduction and / or spread of invasive plant species shall also be outlined. Implementation of this Plan will minimize the potential for adverse effects to vegetation and wildlife as a result of Project construction.

3.2.1.10 Waste Management Plan

The Waste Management Plan (Appendix A12) describes waste generating construction-related activities for the Project. It outlines the methods for waste minimization, recycling, storage and disposal, and the monitoring and reporting requirements. The WMP describes the typical strategies for managing hazardous and non-hazardous wastes in the vicinity of the Project construction site. These strategies are intended to guide the construction contractor's Environmental Monitor in their preparation and implementation of detailed site/activity-specific environmental protection plans or work plans. The Waste Management Plan outlines the procedures and best practices for storage and disposal of wastes generated during construction. Implementation of this Plan and the detailed site/activity-specific plans will minimize the potential for adverse effects to a variety of resources as a result of wastes generated on site.

3.2.1.11 Groundwater Management Plan

The Groundwater Management Plan (Appendix A13) describes construction-related activities for the Project with the potential to release sediments or other deleterious substances into groundwater and / or the aquatic environment, including silt and storm runoff. The plan will outline typical strategies managing ground water quality and present mitigation measures to control the release of contaminants to groundwater during Project construction works. The Plan also describes mitigation measures to manage water collected during dewatering of the excavation site.

3.2.1.12 Traffic Management Plan

The Traffic Management Plan (Appendix A14) describes construction-related activities for the Project with the potential to cause traffic disruptions, delays, or adverse impacts to the public and/or wildlife. It outlines the recommended methods for mitigating traffic related concerns, and monitoring and reporting requirements. The TMP describes measures to verify that construction activities will comply with the EAC, regulatory approvals, applicable legislation and applicable industry best management practices and contains a communications strategy to inform stakeholders, including the public and government agencies, about construction progress and identify methods for providing feedback on issues and concerns.

3.2.2 Environmental Work Plans

EWPs shall be developed by the Contractor(s) to guide all environmentally sensitive works. EWPs are supportive documents that build on the information provided in the CEMP and its associated EMPs to provide detailed instructions on the methodology of specific tasks, including equipment, impact avoidance and mitigation measures to prevent and/or minimize impacts to valued environmental and social components.

A comprehensive list of EWPs required for the Project shall be developed by the Contractor in consultation with the Environmental Manager. EWPs to be developed for the Project shall include, but are not limited to:

- Air Emissions Management;
- Dewatering Management;
- Dust Control;
- Erosion and Sediment Control;
- Fuel Storage, Handling and Dispensing;
- Fuel Tank Foundation Construction;
- Fuel Tank Construction (including welding);
- Hazardous Substances (not listed in the CEMP (as required));
- Hauling and Transport;
- Herbicide and Pesticide Application (as required);
- Invasive Species Management;
- Noise Management (including idling);
- Pipeline Stream Crossings;
- Road Construction;
- Soil Disturbance (sites with potentially contaminated soils);
- Stockpiling and Materials Handling;
- Stripping and Earthworks;
- Stormwater Management;
- Site Clearing; and
- Wildlife Protection.

Preparation Process

Each EWP shall include as a minimum:

1. The scope and intent of the EWP;
2. The activities and locations covered by the EWP;

3. Site and activity-specific mitigation measures to prevent environmental damage and protect valued components from the activities covered by the EWP;
4. Monitoring and testing that will be undertaken to ensure that mitigation measures are effective;
5. Drawings showing the locations covered by the EWP, and the mitigation measures to be implemented, along with all environmentally sensitive areas and environmental resources within or near the planned works;
6. Details regarding the construction techniques that will be used to verify the work being conducted is consistent with all environmental permits, legislation and regulations, Project approvals, the CEMP and the requirements of the EA and PMV;
7. Required spill and environmental emergency response equipment and where emergency response procedures will be posted; and
8. Sign-off by the EM and the Environmental Manager.

VAFFC shall comply with, and shall require that all Project personnel and contractors comply with, all EWPs. EWPs shall be communicated to construction personnel by field supervisors and/or the EM prior to the commencement of works. All EWPs shall be submitted to and accepted by VAFFC and the Environmental Manager prior to commencing project works.

3.3 ENVIRONMENTAL LIAISON AND COMMUNICATION

A Communications Plan has been developed by VAFFC that details how communication and notification will be carried out for the construction of the Fuel Receiving Facility. It targets the general public, nearby residents and businesses, and various government agencies and authorities. This plan summarizes how VAFFC intends to meet the notification and consultation requirements of PMV.

3.3.1 Strategic Approach

The Project Environmental Assessment review process included a robust public consultation and communication program led by the EAO with the support of the Technical Working Group consisting of various federal, provincial, municipal and First Nations representatives.

Several consultation and notification requirements remain to be completed to satisfy specific permit requirements that follow the over-arching EAC. These communications will occur as part of the detailed permitting stage, when more specific design, scheduling, and construction plans are filed for the specific approvals. Remaining permits requiring some elements of public engagement include:

1. Port Metro Vancouver Project Permit (for the Fuel Receiving Facility);
2. BC Oil and Gas Commission Pipeline Permit (for the Delivery Pipeline); and
3. City of Richmond Development Permit (for the Marine Terminal).

In satisfying these permits, VAFFC will undertake a proactive approach so stakeholders are notified about the permitting process and construction activities and how they can provide comment, as well as sharing additional information about the project to address any concerns that were raised through the EA process (notably with respect to safety and the environment).

3.3.2 Consultation Activities

Port Metro Vancouver requires that VAFFC notify and consult with residents and businesses in Richmond, particularly those who are in the vicinity of the Fuel Receiving Facility. A major component of this notification and consultation will be a public Information Session. Notification and consultation shall be carried out prior to the commencement of Project construction works.

VAFFC will work separately with the BC Oil and Gas Commission regarding notification and consultation related to the pipeline component of the project and with the City of Richmond regarding notification and consultation activities it will require.

3.3.3 Communications Plan Objectives

The key objectives of the communications plan are to:

- Communicate information about the Fuel Receiving Facility and the measures being undertaken to construct and operate the project in a safe and environmentally responsible manner;
- Provide key audiences with project construction information and offer them an opportunity to comment; and
- Provide an electronic portal on the project website for on-going project updates and for stakeholders to ask questions throughout construction.

3.3.4 Key Audiences

The key audiences – those directly affected by the Fuel Receiving Facility and key project stakeholders – are listed below.

- Richmond residents and businesses located adjacent to or near the aviation fuel receiving facility;
- Waterstone condos and Waterstone strata council;
- Nearby single family dwellings;
- SilverCity area businesses;
- Land owners in the area roughly bounded by Francis Road and No. 6 Road (see Figure 3);
- Government:
 - City of Richmond;
 - Corporation of Delta; and
 - Richmond and Delta MLAs and MPS.
- Various Authorities:
 - Vancouver Airport Authority; and
 - Port Metro Vancouver.

3.3.5 Information Session

To share information about construction and operations of the Fuel Receiving Facility, VAFFC will host an information session in Richmond (date to be confirmed). Public notification for the information session will be through print advertisements in the following newspapers, beginning at least two weeks prior to the event:

- Richmond News;
- Richmond Review;
- World Journal (Chinese ad); and
- Sing Tao (Chinese ad).

Direct notification of the sessions will be made to:

- Land owners in the area roughly bounded by south of Francis Road to just west of No. 6 Road (see Figure 3);
- Waterstone condos and Waterstone strata council;
- Single family dwellings in the vicinity;
- SilverCity area businesses;
- City of Richmond and Corporation of Delta; and
- Local MLAs and MPs.

Figure 3 Marine Terminal and Fuel Receiving Facility – proposed notification and consultation area (shaded in blue).



The information session will include display boards sharing Project information covering:

- Project overview – description of project components and map;
- Project phases – permitting and construction;
- Permitting process – permitting and how people can provide comments;
- Recap of the regulatory process and consultation undertaken to date;
- Project need and benefits;
- Construction activity and potential impacts;
- Traffic;
- Noise;
- Air quality;
- Hours of construction;
- Operations;
- Emergency response measures;
- Fire prevention and response;
- Spill prevention and response;
- Operational issues (e.g., noise, light, air quality);
- Earthquake preparedness; and
- Site layout and public rights-of-way.

The information sessions will also include:

- Project team members on hand to answer questions;
- Comment form for guests to submit (within two weeks of the event);
- Sign-up sheet for those who want updates electronically; and
- Copies of the BC EAO and PMV EA/screening report and PMV EA decision statement.

3.3.6 Consultation Reports – PMV Permit

Following the two-week comment period, VAFFC will prepare an Engagement Summary Report summarizing the engagement activities undertaken. VAFFC will also submit a Consideration Memo to PMV outlining how VAFFC addressed public comments and feedback resulting from the public consultations.

3.3.7 Internal Consultation

Internal Project environmental meetings will include, but not necessarily be limited to:

- Formal and informal meetings with EAO;

- Meeting and other forms of communication with Environmental Authorities;
- Pre-work orientation meetings;
- Tailgate meetings, and
- A range of other internal environmental meetings as needed.

Appropriate records of meetings and communications will be kept and reported to EAO as required.

3.4 ENVIRONMENTAL AWARENESS EDUCATION AND TRAINING

All Project site personnel shall receive environmental awareness education and training, according to their responsibilities and activities that they will be performing on site. Environmental training shall be prepared and administered by the Contractor's EM prior to the start of on-site works. Attendees shall be required to fill out attendance sheets at the end of their training.

Environmental education and training shall be delivered to contractors working on the Project site throughout construction. Additional ongoing training will be delivered via tailgate meetings, signs and posters, and opportunistic awareness building by Environmental Management Team personnel.

Records of all environmental education and awareness training shall be kept at the onsite Project office and copies shall be provided to the Environmental Manager.

3.4.1 Tailgate Meetings

Environmental awareness training will be conducted on a regular basis for every new activity/scope, and at daily Tailgate meetings for workers involved in the activities. The EM will be present at tailgate meetings to outline the sensitive sites and/or species on site, potential construction-related effects of sensitive works, and the mitigation measures to be employed during works, as outlined in the CEMP, the EMPs and any EWP that relate to the activity.

Daily tailgate meetings will include a review of hazardous materials present on site. Any additional measures that may require implementing, such as traffic speed restrictions on roads, problem wildlife observed, active nests present on site, or ongoing opportunities for corrective and/or preventive actions will also be covered.

3.4.2 Signage and Posters

In addition to formal and informal training, signage will be posted detailing important environmental issues pertaining to the Project site. Signs will include, but not be limited to:

- Spill response procedures at hazardous materials storage facilities, fuel caches, and in Project vehicles, including a list of contacts outlining who to contact and the timeframe for notification
- Posters on important valued components in Project common areas;
- Materials acceptable and not acceptable for disposal in each recycling and waste bin; and
- Herbicide/insecticide treatment signage for invasive species (if required).

3.4.3 Environmental Education and Awareness Review

The effectiveness of Environmental Education and Awareness procedures will be regularly evaluated and adapted by the Environmental Team to incorporate any new and relevant environmental issues observed on site and described in monitoring reports. Topics will be added or adapted based on the recommendations, opportunities for improvement, preventive actions, and corrective actions that are detailed in environmental monitoring reports and environmental audits, and reviews will be performed following any incident as per the Accidents or Malfunctions Management Plan and the Spill Prevention and Emergency Response Plan.

3.4.4 Training Records

Workers will be required to sign attendance sheets for each training module that they have completed. In addition, an Environmental Orientation Record will be completed for all work involving an environmental component (e.g., work utilizing a EWP). The contractor will be responsible for ensuring that the environmental requirements of the work are reviewed with the workers before work is started and that a record of the discussion is documented on the Environmental Orientation Record. Training records will be filed with the EM and the VAFFC Project Manager.

3.5 ENVIRONMENTAL MONITORING AND REPORTING

3.5.1 Environmental Monitoring

Environmental monitoring is essential to ensuring effective implementation of the environmental plans and their supporting documents. Environmental monitoring will be carried out on a regular basis during construction by the EM, at a frequency suited to the level of environmental risk of the work being completed, as further outlined in the Environmental Monitoring Plan. The EM will inspect, evaluate and report on the implementation of environmental mitigation measures implemented on site throughout Project construction works. The Contractor will comply with and require all Project personnel to comply with the Environmental Monitoring Plan. Each EMP contains key monitoring requirements for specific environmental aspects of the Project.

In addition to monitoring carried out by the EM, the Environmental Manager will conduct monthly audits of construction works, with more frequent on-site audits conducted depending on the type and risk of construction activities.

Both the EM and the Environmental Manager will be notified prior to any works within 30 m of a watercourse.

As per EAC TOC Condition No. 4, the EM will have the authority to halt work if in his/her opinion, current or imminent impacts to the environment that have not been approved as part of the CPD, or other regulatory permits, approvals or applicable authorizations, are at risk of occurring. Appropriate mitigation measures will be carried out by the Contractor under the guidance of the EM. The EM will document the issue(s), mitigation measures implemented (including providing a photographic record), and comment on their effectiveness. Documentation will be available to be provided to the EAO and PMV, as required.

3.5.1.1 Environmental Monitoring Plan

An Environmental Monitoring Plan shall be prepared by the Contractor to guide monitoring and reporting activities to be carried out prior to, during and post-construction. The key objectives of the Environmental Monitoring Plan are to:

- Provide a consolidated summary of all environmental monitoring and reporting requirements for the Project;
- Detail specific monitoring actions to be carried out by the EM construction works that support the range of EMPs contained in the CEMP (e.g., type and frequency of observations, and data collection methods and protocols to be followed); and
- Assist the Environmental Manager in identifying, eliminating or mitigating potential environmental issues and effectively responding to environmental incidents, as required.

Monitoring components associated with each EMP shall be discussed briefly in each of the EWPs, with more detailed monitoring information included in the Environmental Monitoring Plan. The Environmental Monitoring Plan shall be reviewed and accepted by VAFFC and the Environmental Manager prior to implementation and shall include the following components:

- A description of the frequency of inspections/monitoring throughout the course of the Project;
- The minimum mandatory field communication protocols;
- Specific monitoring requirements for each type of activity and/or environmental resource;
- Specific criteria that will be adhered to;
- Details of the manner in which notice is to be given to the Project parties when an environmental risk or impact is observed and when construction activity is found to be out of compliance with the CEMP, EMPs, EWPs and/or PLAs;
- Details of the process for escalating enforcement of compliance of construction activities with the CEMP, EMPs, EWPs and/or PLAs; and
- The format and frequency for the preparation of reports on the compliance of the construction activities with the CEMP, EMPs, EWPs and/or PLAs.

The EM shall be responsible for ensuring that all commitments listed in the Environmental Monitoring Plan are implemented.

3.5.2 Reporting

A number of environmental reports will be produced throughout the life of the Project, and these will identify effective implementation of environmental mitigation measures and any areas for improvement, as well as remedial actions. Environmental reports include:

- Monthly Environmental Monitoring Reports;
- Annual Environmental Monitoring Reports; and
- Environmental Incident Reports.

3.5.2.1 Monthly Environmental Reports

The monthly environmental monitoring report will be prepared for each month after construction start to the completion construction works. The environmental monitoring report will be submitted to VAFFC and the Environmental Manager within seven days after the end of each month. Monthly environmental monitoring reports will include, as a minimum, the following information:

- Name(s) of environmental monitor(s);
- Period covered by report;
- Date report submitted;
- Report recipient(s);
- Contractor(s) undertaking work during the reporting period;
- Overall weather conditions during the reporting period;
- Description, photos and status of Project work activities by area;
- List of meetings and any other material communications with any environmental Authority (both those that occurred during the reporting period and any that are scheduled or anticipated in future reporting periods) and a summary of key issues discussed or expected to be discussed;
- A copy of any application for a permit, report or other submission filed with any environmental authority during the reporting period, an updated list of all permits issued for the Project work and a schedule for obtaining any additional permits required for the Project work;
- A status report regarding implementation of all specific mitigation plans;
- A summary of environmental incidents that may have occurred during the reporting period;
- A description of outstanding environmental issues and/or non-compliance with environmental laws, permits or other VAFFC environmental obligations and corrective actions taken or that will be taken and a schedule for such actions;
- Any issues or concerns raised by the EM and measures taken or that will be taken to address those issues or concerns; and
- A summary of environmental monitoring data collected and all results received during the reporting period, including water and soil sampling.

3.5.2.2 Annual Environmental Reports

Annual environmental reports will be prepared for each year after the construction start to the end of construction works and will be submitted to VAFFC's representative and the Environmental Manager by January 15 of each year. The annual environmental report will include, as a minimum, the following information:

- A description of the key Project work activities undertaken during the period covered by the report;

- A description of key environmental mitigation measures implemented, successes and failures of those mitigation measures, a summary of environmental incident reports generated during the Reporting Period, and a list of all failures by VAFFC to comply with environmental obligations, and measures taken, or that will be taken, to address each failure and a schedule for completion of any such measures;
- A description of how the EAC and PMV Project approval conditions are being complied with, or if they are not being complied with, the measures that VAFFC is taking to rectify the failure;
- A schedule for implementing any EAC and PMV Project approval conditions that have not been satisfied or implemented;
- A description of outstanding environmental issues and/or non-compliance with environmental legislation, PLAs or other environmental obligations, corrective actions taken or that will be taken and a schedule for such actions;
- A summary of environmental monitoring data collected during the reporting period, including water and soil sampling, and an analysis of any trends within that data; and
- A summary of key issues discussed with environmental authorities during the reporting period and measures taken to address any concerns raised by the environmental authorities.

Environmental personnel will also be responsible for submitting environmental incident reports outlining spills or other environmental incidents as outlined below.

3.5.2.3 Environmental Incident Reports

Environmental incident reporting must be carried out for incidents that pose or may pose a threat to the environment, such as spills, encroachment into sensitive areas or outside the Project footprint, disruption or destruction of wildlife or wildlife habitat, or impacts to water quality that result in an exceedance of the water quality guidelines for drinking water and/or aquatic life (whichever applies). Reporting will be carried out in accordance with the requirements of all regulatory agencies, as well as the requirements of VAFFC. Spills may be reportable to Emergency Management BC (EMBC) under the *Environmental Management Act* Spill Reporting Regulation and/or the *Transportation of Dangerous Goods Act*. In addition, spills of any volume to fish-bearing waters must be reported to Fisheries and Oceans Canada (DFO).

An Environmental Incident Report will be generated for any of the following:

- Spills reportable to Emergency Management BC;
- Spills of any amount to water (surface or ground water), any spill within 15 m of the wetted perimeter, any spill to a dewatered area, or any spill with the potential to introduce a harmful substance to the aquatic environment;
- Spills on land greater than 5 L or with a surface area greater than 1 m² and/or deeper than 300 mm, or any release of a hazardous substance that could cause contamination of the Site or any lands or waters in the vicinity of the Site;

- Any incident that poses a safety or health risk, including but not limited to vehicle collisions and fire;
- Any repetitive occurrence (i.e., an occurrence of 2 times or greater);
- Any occurrence involving more than 1 piece of machinery;
- Adverse publicity with respect to the environment;
- Alteration or damage to heritage or archaeological resources;
- External reporting requirements derived from a project approval condition, especially if attached to a non-routine or unexpected event; and
- Any incident that has or could result in the violation of a regulatory Act, Regulation or guideline, including encroachment into sensitive areas, disturbance to wildlife or bird nests, disturbance to an archaeological site, or transfer of materials from contaminated sites to a previously uncontaminated area.

Details of reportable volumes of substances and agency reporting procedures, along with a list of emergency contacts are outlined in the Spill Prevention and Emergency Response Plan (Appendix A9).

3.6 ENVIRONMENTAL DOCUMENT AND DATA MANAGEMENT

A document and data management system will be established early in the Project, which specifies:

- The kinds of documents/records subject to review;
- Documents/records to be transmitted to VAFFC;
- Naming conventions;
- Revision conventions; and
- Expectations with regards to turn-around time at all levels.

The Environmental Manager will promptly provide VAFFC's Representative with copies of all environmental site assessments, audits, reports and test results relating to the Site, the Project, or the Project work including all assessments, audits, reports and tests conducted by or on behalf of or coming into the possession of the Environmental Manager at any time whether before or after the construction start date.

Environmental document control will be integrated with VAFFC's general Project document control system on the FSM Management Group FTP site. All environmental records relating to the Project, the Site and the Project work, will be maintained by the VAFFC Environmental Manager.

Examples of documents that will be controlled include the CEMP, Environmental Monitoring Plans, EMPs, EWPs, employee training records, environmental checklists, and Environmental Incident Report forms. Records generated in accordance with any and all of the above plans will also be maintained on file with the Project Contractor.

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