PORT of vancouver | Vancouver Fraser Port Authority

Project & Environmental Review Guidelines

Construction Environmental Management Plan (CEMP)

Environmental Programs, Vancouver Fraser Port Authority

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Canada

Contents

1. Overview

These guidelines are intended to assist applicants of projects on lands and waters managed by Vancouver Fraser Port Authority in developing a Construction Environmental Management Plan (CEMP) as part of the Project and Environmental Review process.

2. Introduction

This document provides guidance to port authority tenants who are proposing works and activities (referred to herein as “projects”) on port authority-managed lands and waters. These guidelines support the port authority’s Project and Environmental Review process and should be used by both tenants and environmental professionals who may be hired to assist with technical aspects of CEMP development.

3. Principles/objectives

Projects on port authority lands and waters may generate construction-related impacts, such as dust, noise, turbidity, and hazardous waste. While potential construction impacts and relevant mitigation measures vary by project, many are commonly considered during the Project and Environmental Review process. The objective of these guidelines is to assist applicants through the preparation of a CEMP as they progress through the Project and Environmental Review process. Where projects are found to warrant a CEMP, these guidelines are intended to assure that the CEMP is prepared to an appropriate standard.

4. Applicability

These guidelines are specific to the construction phase of a project only and do not address the ongoing operations subsequent to construction. Information on the assessment of operational effects as part of the Project and Environmental Review process is available in other guidelines, such as Guidelines - Air Emission Management Plan, Guidelines - Air Assessment, Guidelines - Stormwater Pollution Prevention Plan and Guidelines - Environmental Noise Assessment.

The CEMP guidelines apply to proposed projects with the following characteristics:

- Construction-related emissions and releases, such as noise, light, dust or debris, may impact environmental resources or the surrounding community
- Construction-related activities are located within or in close proximity to highly productive or sensitive habitat or features, such as eelgrass or eagle nesting trees
- Construction-related activities are located within or in close proximity to species at risk habitat
- Known or suspected subsurface contamination will be disturbed
- A new or modified discharge to air or water will occur during construction
- Construction-related activities will occur outside appropriate timing windows for the protection of fish and wildlife
- A new or unique construction method with uncertain impacts will be implemented

Based on these project characteristics, it is anticipated that mitigation measures will need to be developed to directly address the identified potential impacts. A CEMP is not anticipated for projects determined to be category A under the Project and Environmental Review process, but is anticipated to be required for most category C and D reviews. Category B reviews that involve one of the characteristics identified above on a relatively small scale or duration may be required to provide a targeted mitigation plan that focuses on addressing potential impacts to a specific environmental resource. The need for a

full CEMP will be determined by the port authority and communicated to the applicant during the preliminary review phase for category C and D reviews, and at the time of project category confirmation for category B reviews. Further information on the categories of review is available in the Project and Environmental Review Application Guide. The CEMP should be appropriate to the scale, duration, and potential impacts of the project.

These guidelines are limited in application to the port authority and its Project and Environmental Review process. The permit holder is responsible for obtaining any and all required permits, authorizations, and approvals from any other authority having jurisdiction and for complying with any other applicable legislation, such as the *Fisheries Act, Migratory Birds Convention Act,* and *Species at Risk Act.*

5. Construction Environmental Management Plan (CEMP)

Projects requiring a CEMP have a potential for construction-related activities to impact environmental resources or the surrounding community. The permit holder is required to retain the services of a qualified environmental professional (QEP) to prepare a CEMP that presents mitigation measures and best management practices (BMPs) that will be implemented to avoid or minimize adverse impacts. The CEMP should be based on the environmental conditions at the site, the nature of the proposed project, and the findings of any assessments conducted as part of the application.

The following sections set out the general outline, components, and context to be included in a CEMP. The level of detail should be scaled to the size and complexity of the project and the potential for construction-related activities to generate impacts of concern. The CEMP is expected to be updated as project details change. The port authority will make a final determination on the suitability, completeness, and adequacy of a CEMP.

5.1. Introduction

The introduction section should define the purpose of the CEMP and generally describe its use in the context of the project.

5.2. Project information

These sections should include relevant project information.

5.2.1. Location

Identify the project location, using the name of the municipality as well as coordinates or landmarks for clear identification. Include appropriately scaled figure(s) for visual identification and reference.

Example text:

The project is located near Town name, Province. The geographical coordinates at the project's approximate centre are 000° 00' 00" North and 000° 00' 00" West and borders the Fraser River on the north side of the Property.

The attached Figure 1 illustrates Project location.

5.2.2. Project description

This section should give a basic overview of the project and the construction-related project components. Information should include, but may not be limited to:

- Project components/tasks
- Construction methods (e.g., equipment, number of personnel)

5.2.3. Project schedule

The CEMP should include an overall expected schedule as well as a detailed project schedule according to construction components/tasks. Ideally, this will be presented in table format, Gantt chart, or as a list.

For example:

The project is expected to commence MM/DD/YYYY and be completed by MM/DD/YYYY.

Task	***Proposed dates and approximate duration***
Clearing/stripping/grubbing	
Preload placement/removal	
Site servicing	
Building foundation	
Pile driving	
Etc.	

5.2.4. Site description

The site description section should provide a summary of existing environmental conditions and applicable information related to potential or known environmental resources or concerns at the site. The level of detail provided should reflect the project complexity and context. In many cases, a site visit by a QEP should be conducted to verify site conditions and potential impacts. Where applicable, the findings of any assessments conducted as part of the Project and Environmental Review process, such as a habitat assessment or archaeological impact assessment, should be referenced.

5.3. Contacts and responsibilities

The effective environmental management of any project requires a coordinated effort from all individuals involved. The following sections outline the need to identify the responsibilities of key personnel involved in project construction.

5.3.1. Key project personnel

The permit holder is expected to maintain a list of project contacts throughout the construction phase of the project. This can be displayed in table format and should also include those regulatory bodies that have input to the project, such as Fisheries and Oceans Canada (DFO), Environment and Climate Change Canada, Navigation Protection Program, as well as contacts from the local municipality.

The project contact list for the works proposed in a CEMP should be completed as soon as the information is known and made available to all parties.

For example:

Project contact list

Name	***Role/company***	***Phone number***
	Construction foreman	
	Environmental Monitor	
	Independent Monitor (required for category D and designated projects)	
	Client name contact	
	Port authority contact	
	DFO contact	
	Other permit/approval contact	
	Municipal contact	

5.3.2. Environmental monitor responsibilities

This section should describe the role and responsibilities of the environmental monitor (EM).

On-site monitoring is a key component of ensuring that the recommendations made in the CEMP are implemented properly and function as intended (e.g., appropriate installation and location of erosion and sediment control measures, cleanliness of equipment, suitability of secondary containment for fuel storage). It is expected that a QEP be retained as the EM to provide guidance on implementing the recommended measures and to develop additional mitigation measures if the need arises.

Monitoring events should be at an appropriate frequency based on specific work tasks/procedures and the potential for adverse impacts to occur. An appropriate schedule (frequency and duration of site visits) should be established between the EM, the permit holder, and all involved regulatory agencies. In general, the EM will be familiar with the day-to-day conduct of project activities and be on-site during activities with the potential to impact sensitive environmental or other features, when untested technologies or mitigation measures are implemented, or as determined in discussion with the permit holder and regulatory agencies. Monitoring should be conducted with greater frequency during periods of inclement weather (e.g., heavy precipitation, strong winds) and during critical components/tasks of the project, such as working in water. Key monitoring stages may include, but are not necessarily limited to:

- During activities conducted below the high water mark of a waterbody
- During installation of erosion and sediment control measures
- During start-up of new phases of the project

Example content for this section includes:

The primary responsibility of the EM is to ensure that the environmental protection objectives of the permit holder, port authority, and applicable approvals/permits are met by ensuring that the requirements of this CEMP, and other applicable conditions, are adhered to. Typical responsibilities of the EM include those identified below; however, specific items are expected to be refined and/or expanded as per the needs of the project:

- *The EM will monitor compliance with the CEMP and relevant permit conditions.*
- *The EM will communicate the requirements of the CEMP to project members during pre-job and tailgate meetings.*
- *The EM will be onsite as per the schedule established between parties prior to project start. The EM will remain on-call during non-critical work periods to respond to emerging environmental issues.*
- *The EM will review the contractor's work procedures to ensure functionality and compliance with the CEMP and applicable regulations, standards and BMPs.*
- *The EM will provide advice in preparing for work activities in a manner that mitigates adverse effects.*
- *The EM has the authority to modify and/or halt any construction activity at any time if deemed necessary for the protection of the environment.*
- *The EM will advise project members if project activities have caused or are likely to cause an environmental incident and make recommendations for corrective action.*
- *The EM will liaise directly with project members and provide technical advice for the purpose of resolving situations that may impact the environment as they arise.*
- *The EM will maintain complete records of activities related to the implementation of the CEMP. This should include any measurements taken (e.g. pH, turbidity, temperature, conductivity), photographs and incident reports.*
- *The EM will complete and submit environmental monitoring reports to the permit holder, port authority, and other parties (as required within permit/approval conditions) and will report any unanticipated adverse effects to the environment. Such reports should include the nature of the effect, its cause, mitigation and/or remediation implemented, and whether a work stoppage was ordered, as well photographs, analyses, and measurements, if applicable.*
- *The permit holder or EM will notify the port authority (and the Independent Monitor for category D and designated projects) immediately in the event of a non-compliance.*

Example content for environmental monitoring reports is provided in Appendix 1. Monitoring reports will be reviewed by the port authority to determine the adequacy of the monitoring and content of the reports.

5.3.3. Permit holder/contractor responsibilities

This section should describe the role and responsibilities of the permit holder/contractor during construction. Typical responsibilities of the permit holder/contractor include those identified below; however, specific items are expected to be refined and/or expanded based on the needs of the project:

- Contractors will review the project CEMP with their staff and sub-contractors prior to commencing works
- Contractors will comply with the port authority project permit and any other agency permit or licence issued for the project as well as all other applicable federal, provincial, and municipal laws, statutes, by-laws, regulations, orders, and policies
- Contractors must cooperate with the EM appointed for the work. They must comply with written or verbal instructions with respect to conducting activities in compliance with the mitigation measures outlined in the CEMP.

- Contractors will correct deficiencies and any non-compliance issues upon direction from the EM whether written or verbal. Corrections should be made as soon as reasonably possible, ideally within 24 hours of directions. The permit holder or EM will notify the port authority (and the Independent Monitor for category D and designated projects) immediately in the event of a non-compliance.

5.4. Relevant environmental legislation

This section should describe the environmental legislation and legal requirements applicable to the project. An example table is provided and can be incorporated into the CEMP for those laws, regulations, and by-laws that apply. The examples in the table are not comprehensive and others specific to the project may apply. For example, projects that are within, or partly within port authority property boundaries may require permits, authorizations, and approvals from other government authorities. The permit holder's QEP should ensure that the information included is accurate and up to date.

Example:

Table: List of federal, provincial, regional district, and municipal legislation and legal requirements as they relate to the project

Act, regulation or bylaw	***Description***	***Applicability***	***Approval or permit in place/forthcoming; OR, requirements met***
Federal			
Fisheries Act (administered by DFO and Environment and Climate Change Canada)	*The Fisheries Act is the main federal legislation providing protection for fish, fish habitat and water quality in Canada.*	*Describe how the legislation applies to the Project. Example: The Proposed work requires placement of rip-rap below the high water mark (HWM).*	*Example: QEP completed self-assessment. Request for Review submitted and Letter from DFO attached. No Harm to Fish that support a Commercial, Recreational or Aboriginal Fishery expected provided mitigation contained in [Section #] is applied.*
Migratory Bird Convention Act			
Species At Risk Act			
Vancouver Fraser Port Authority Non-Road Diesel Emissions (NRDE) Fee	*The NRDE fee recovers costs associated with managing air quality and reducing diesel particulate matter emissions*	*The NRDE Fee is applicable to all parties granted the right by the port authority to occupy lands owned, managed, or administered, by the port authority.*	*Responsible parties must not introduce non-road diesel engines that are "non-certified" (Tier 0) or certified as "Tier 1" without prior written approval from the port authority.*

Act, regulation or bylaw	***Description***	***Applicability***	***Approval or permit in place/forthcoming; OR, requirements met***
Provincial			
Spill Reporting Regulations of the Environmental Management Act (EMA)			
Contaminated Sites and Hazardous Waste Regulations of the EMA			

Permit holders should contact the adjacent municipalities regarding the proposed construction activity and any related local government approvals that may be required outside of the port authority's jurisdiction.

For all projects, it is expected that the permit holders consider and proactively address any incidents that result in non-compliance with applicable legislation, e.g., spills of reportable quantity. Such incidents must be reported to the relevant agency or authority, such as Environment and Climate Change Canada, DFO, and the Emergency Management BC Program, formerly Provincial Emergency Program (PEP). Examples of environmental incidents include, but are not limited to:

- Discharge of deleterious substances to a waterbody, such as:
  - Spills of oil, fuel or chemicals
  - Sediment laden water entering a waterbody
  - Concrete materials (e.g. wet grout) spilled into water
- Work and/or removal of vegetation in or near waterbodies without regulatory approval (exclusive of sites that satisfy DFO Self-Assessment criteria)
- Death of fish or wildlife

5.5. Project mitigation measures and environmental specifications

The permit holder will revise/update CEMP sections/headings and text based on relevancy to the construction of the project. The subsections below should be used where applicable and adapted to the project being proposed. Additional components/tasks may also be needed. The headings and text presented here are provided to guide the formation of mitigation measures and specifications to be designed and implemented during construction. Example text has been included to provide context.

Environmental standards, guidelines, and BMPs should be referenced where applicable to construction-related impacts associated with the project. Where any BMPs or guidelines conflict, the port authority should be consulted for clarification. The port authority project permit may also include specific requirements to mitigate impacts associated with any of the subsections below. The CEMP should be updated as appropriate to incorporate any such requirements.

Examples of practices and mitigation measures regularly required by the port authority in its project permits are provided in Appendix 2 for consideration when preparing a CEMP.

5.5.1. General practices

A list of general practices related to construction, typically administrative in nature, should be identified here.

For example:

- *Ensure all contractors and site managers review this CEMP and the applicable guidelines prior to each project phase or new activity.*
- *Ensure contractors know how to properly install any protection measures and understand BMPs used on the project. Improperly installed measures do not perform their intended functions and subsequently do not provide environmental protection.*
- *Stockpile, or have readily available, supplies of erosion and sediment control materials as appropriate on-site such as (but not limited to) rock, gravel, grass seed, silt fencing, staking, polyethylene sheeting, etc.*
- *Plan and schedule project activities for dry weather whenever possible. Minimize project works and equipment travel during periods of heavy precipitation.*
- *Site managers and contractors will be prepared to change existing measures and BMPs should they fail or additional measures be required. The EM will be notified of any changes to ensure they are adequate and installed properly.*

5.5.2. Site access, mobilization, and laydown areas

Prior to construction, the method by which the permit holder plans to access the site, mobilize construction-related equipment, address hauling access and routes, as well as planned laydown and stockpiling locations within the site should be clearly described. Any special challenges for site access or mobilization should be identified. A detailed drawing/figure of the site showing these locations should be incorporated into the CEMP. Suggested items for consideration may include, but are not limited to:

- Mobilization will be planned to minimize the number of trips to and from the site
- A laydown area for storage of equipment and materials will be established. It will be located on a flat, stable area at least 30 m from any waterbody.

5.5.3. Air quality

Air emissions such as vehicle/equipment exhaust, dust and vapours associated with construction or demolition-related activities should be minimized and managed to avoid adverse health, safety, nuisance, and other environmental effects on and off-site.

The Guidelines - Air Emission Management Plan provides a basic framework and can assist in the development and scoping of a plan for the CEMP.

This section should include a list of mitigation measures. Examples of control measures include, but are not limited to:

- *Dust-generating activities will be minimized as much as possible, especially during windy periods. Dust suppression agents, if used, shall be approved by the port authority for use. Consideration of run off from any dust suppression agents, including water, will be considered for impacts to storm water management.*
- *The track out of vehicles from the site will be managed (wheel wash station, cleaning of road ways, etc.) in order to reduce the potential for the dispersion of material and debris as fugitive dust.*
- *Material loads entering or exiting the site will be covered as appropriate.*
- *No burning of oils, rubber, tires and any other material will take place at the site.*
- *Stationary emission sources (e.g., portable diesel generators, compressors, etc.) will be used only as necessary and turned off when not in use.*

- *Equipment and vehicles will be turned off when not in active use.*
- *All equipment, vehicles and stationary emission sources will be well-maintained and used at optimal loads to minimize emissions.*
- *Vehicles or equipment producing excessive exhaust will be repaired or replaced prior to being used on the project.*

More detailed guidance on mitigation measures is available in *Best Practices for the Reduction of Air Emissions from Construction and Demolition Activities* prepared for Environment Canada (Cheminfo Services Inc. March 2005).

5.5.4. Noise and vibration

Noise generation and vibrations resulting from equipment and associated activities during construction is best addressed through appropriate noise management practices. The permit holder is expected to manage construction-related noise impacts and provide applicable mitigations in a list.

For example:

The following BMPs are recommended to minimize noise impacts:

- *Construction activities will be limited to Monday to Saturday between 7:00 a.m. and 8:00 p.m., excluding holidays. Should construction activities be required outside these hours, the contractor must contact the port authority to determine if exceptions are permitted. All equipment will be properly maintained to limit noise emissions and fitted with functioning exhaust and muffler systems. Machinery covers and equipment panels will be well fitted and remain in place to muffle noise. Bolts and fasteners will be tight to avoid rattling.*
- *Engines will be turned off when not in use or reduced to limited idle (or as appropriate to reduce air emissions).*
- *The affected community and host municipality will be notified of the nature and likely duration of any particularly noisy operations that may be forthcoming such as frequent truck traffic, pile driving, and when it will be necessary to work outside daytime and early evening hours.*
- *Noise monitoring will be conducted during particularly noisy activities to ensure the predicted impacts are not exceeded.*

5.5.5. Machinery and equipment

It is expected that the permit holder will provide a list of all equipment and machinery to be used on site during construction, identifying: equipment type, fuel type, year of manufacture, and engine power rating. This section should direct the contractor to implement mitigation measures to avoid or minimize impacts resulting from operation and storage of equipment during construction. Equipment maintenance on a Project site should be discouraged.

Example mitigation could include:

- *Equipment and machinery will be in good operating condition and maintained free of leaks, excess oil and grease, invasive species, and noxious weeds. Equipment will be checked daily for leaks or spills.*
- *Equipment will be operated at optimum rated loads and be turned off when not in use to minimize exhaust and noise emissions. Equipment producing excessive exhaust or noise will be repaired or replaced.*
- *Refueling of equipment will occur on land at least 30 m from any waterbody, where possible. Where 30 m is not possible, a location as far as possible from the waterbody will be chosen, taking into consideration topographic features and slope. The refueling area will have a spill containment kit immediately accessible and personnel will be knowledgeable in the use of the kit (see Section 5.7 for the CEMP Fuel Management Plan).*

- *A spill containment kit will be readily accessible both on site and on each piece of equipment in the event of a release of a deleterious substance to the environment. All members of the construction team will be trained in the use of spill containment equipment/items. Any spill of a substance that is toxic, polluting, or deleterious to aquatic life of reportable quantities must immediately be reported to the Emergency Management BC Program 24-hour phone line at 1-800-663-3456 (see section below for Spill Response Plan).*
- *Light spill will be reduced by pointing lights downward and placing task lighting as close to the work area as possible.*

5.5.6. Erosion and sediment control

Soil management must be considered when project activities, such as clearing vegetation, moving soil, excavating, or placing fill, have the potential to contribute sediments to nearby waterbodies or generate dust. Permit holders are expected to manage soil, surface runoff, and disturbed soil (which may be tracked off site by equipment and vehicles) during construction.

The following are examples of mitigation measures to manage soil, minimize erosion, and reduce sediment mobilization for consideration in preparing a CEMP:

- *Erosion and sediment control devices (such as, but not limited to, silt fencing, straw, mulch, gravel for check dams, etc.) will be available for use on site. Construction team members will be trained in the installation and use of the devices. The EM must review installation and approve placement and use prior to work beginning.*
- *Construction team members will be prepared to quickly erect measures to minimize sediment entering receiving waters if necessary. The overall goal is to isolate the work area and prevent any potential sediment laden runoff from entering a waterbody or encroaching onto adjacent properties or roadways.*
- *Minimize the area of soil exposed at any one time by: phasing construction activities; retaining vegetation as much as possible; and, once construction works are completed, stabilizing any exposed soils as soon as possible using temporary measures such as mulch, erosion sediment control blankets, hydro-seeding, and/or plastic sheeting or planting long-term vegetation (if during the appropriate time of year).*
- *Periods of heavy precipitation are possible during the proposed construction schedule. As much as possible, earthworks will be scheduled to be conducted and completed during dry weather. When significant wet weather is encountered, additional measures may be required to minimize erosion potential.*

5.5.7. Contaminated soil and groundwater management

Where applicable, the CEMP should include procedures for the management of contaminated soil and groundwater that may be removed or handled during construction-related activities. These procedures may include temporary stockpiling and monitoring of soil, provisional testing of contaminated soil and groundwater, decommissioning of monitoring wells, and tracking and record keeping. In most instances, the CEMP should include procedures for handling contaminated environmental media not previously identified prior to construction.

In instances where there is known contamination within the project footprint, a soil, sediment and/or groundwater management plan is required. The components of this plan include (as applicable) but are not limited to the following:

- Site introduction: a description of the existing soil, groundwater, and soil vapour conditions
- Regulatory framework: a description of the federal and provincial guidelines and standards considered applicable to the project site AND the receiving site

- Management procedures during excavation and/or dewatering works:
  - Monitoring well decommissioning plan
  - Confirmatory soil sampling plan
  - Field screening methodology
  - Management of suspect material
  - Stockpile management and sampling procedures
  - Material loading procedure, trucking rate, traffic management plan for trucking
  - Water storage and sampling procedures
- Backfill procedure
- Disposal plan: loading, trucking, receiving site, etc. if not already discussed above
- Emergency response, health, and safety
- Tracking and record keeping, plan for submitting manifest forms
- Appendices that could be included:
  - Existing analytical results applicable to the work area
  - Site figure
  - Existing analytical figures or delineation drawings
  - Figures overlaying the project plan with the areas of environmental concern (with specific boreholes on the detailed drawings)

5.5.8. Vegetation and wildlife management

Permit holders must minimize the potential for negative impacts to wildlife and vegetation during construction-related activities through implementation of mitigation measures such as the following examples:

- *Should a rare or sensitive species be identified at the site at any time during the project, the EM will be notified immediately for further direction, followed by notification to the port authority.*
- *Vegetation removal will be minimized as much as possible. Retain large trees where possible and leave coarse woody debris on the ground to provide cover and reduce erosion potential.*
- *Vegetation removal that will affect trees used by birds and wildlife will be avoided while these animals are breeding, nesting, roosting, or rearing young. Tree removal should be conducted outside of the general bird breeding season, which falls between April 1 and July 31.*
- *Any vegetation to be removed should be surveyed by an appropriately qualified environmental professional prior to the start of work to identify any breeding, nesting, roosting, or rearing birds and determine appropriate mitigation.*
- *Organic/food waste will be managed to avoid attracting wildlife to the site.*

5.5.9. Concrete works and grouting

If wet concrete products are to be used during construction-related activities, permit holders are expected to prevent and minimize the potential for concrete to impact the receiving environment, particularly aquatic environments.

It is expected that permit holders will incorporate proper mitigation measures and appropriate work site isolation techniques within the CEMP to prevent and minimize the potential for adverse effects to the environment during concrete pouring and grouting. Uncured or wet concrete must be prevented from entering a waterbody.

For example:

- *Concrete will be carefully poured to minimize spillage. Complete isolation of the work area is required for cast-in-place concrete works near or below the high water mark of a waterbody.*

- *Proper housekeeping practices and appropriate work site isolation techniques will be employed to minimize the potential for spills.*
- *Appropriate spill cleanup materials will be readily available and easily accessible. Contractors will be aware of the materials required to clean up a concrete spill.*

5.5.10. Marine works

Marine construction-related activities may take place from marine-based rigs, derricks, and scows, as well as from land. Potential impacts to aquatic resources during construction-related activities must be mitigated by implementing appropriate measures.

For example:

- *Marine construction will coincide with DFO timing windows for least risk in marine and estuarine habitat.*
- *Barges or other vessels will not ground on the foreshore or river/seabed or otherwise disturb the foreshore or river/seabed (including disturbance as a result of vessel propeller wash).*
- *Visual and hydrophone monitoring will be conducted during pile driving activities to assess impacts on fish. If sound pressures over 30 kPa are measured, or distressed, injured, or dead fish are observed following the initiation of pile driving, work will be halted immediately and measures to reduce the sound pressure waves will be implemented before the work is resumed.*
- *No equipment will operate on the intertidal foreshore.*

5.5.11. Archaeological resources

The permit holder must ensure that archaeological resources are not impacted during construction-related activities. Procedures should be established to mitigate impacts in the event that evidence of what is suspected to be an archaeological resource is encountered.

An Archeological Chance Find Procedure has been developed by the port authority and can be used as a guide for what to do when suspected archeological resources are uncovered during the lifetime of the project.

For example:

- *Immediately stop any activities that might disturb the archaeological resource or the site in which it is contained.*
- *Do not move or otherwise disturb the artifacts or other remains present at the site.*
- *Stake or flag off the site to prevent additional disturbances.*
- *Immediately notify the port authority.*

5.5.12. Sensitive habitat features and species

It is expected that the permit holder will have a good understanding of sensitive habitat features and environmental resources that may be impacted by construction-related activities. The BMPs to be employed in order to mitigate the potential effects would vary greatly depending on the identified feature or species, its sensitivity to the project, and the proximity of the feature/habitat to the project footprint. Consultation with relevant specialists and/or liaison with federal and/or provincial species at risk specialists may be required.

5.6. Emergency response

An integral part of effective environmental management during construction-related activities is a comprehensive emergency response plan, which, when initiated allows for the rapid response of emergency services and/or the containment and cleanup of environmental emergencies. The following sections provide a general outline for incorporating an effective response plan into the overall project CEMP.

5.6.1. Emergency communication

Clear and rapid communication is essential when dealing with emergencies. The CEMP should include a communication plan, including contact information for all parties who are responsible for the project, or are critical to the response or reporting of accidents or environmental emergencies. Below is an example contacts table.

Table: Emergency contact numbers

Agency	***Phone number***
Emergency Services	*911*
Port authority Operations Centre	*604.665.9086*
LOCAL non-emergency police	
LOCAL non-emergency fire	
Hospital	
Emergency Management BC	
BC Emergency Spill Reporting Line	
Canadian Coast Guard	

5.6.2. Environmental emergency plan

Permit holders should identify potential environmental emergencies that may occur while construction is ongoing. These may include but are not limited to:

Reportable fuel spills:

- Sediment laden water leaving the site or entering a waterbody
- Negative wildlife interactions
- Observation of previously unidentified sensitive environmental features

The EM should be notified of all environmental emergencies. The EM should assess and record all incidents and determine appropriate action. All significant emergencies should be reported to Emergency Management BC (formerly Provincial Emergency Program) and The port authority's Operations Centre.

5.6.3. Spill response plan

The inclusion of a spill response plan specific to the types and quantities of potentially hazardous materials which are to be used during construction is required in all CEMPs, and the permit holder is expected to review, understand and include reportable spill quantities.

The following represents the minimum scope for permit holder spill response/management procedures:

- Assess safety – ensure unnecessary people are kept clear of the area and that people with proper training and equipment deal with the spill. Put on any required personal protective equipment and consult Safety Data Sheets.
- Stop the source – if required, and when it is safe to do so, stop the spill at its source. This may simply be righting an overturned container or sealing a hole.
- Contain and control the spill – the spill should be prevented from infiltrating into the ground or entering a waterbody. If the spill occurs on water, booms should be immediately deployed to prevent its spread.
- Clean up the spill – utilize appropriate absorbent pads or other materials based on the type of substance spilled. The method of disposing of the waste is dependent on the amount and type of deleterious substance that was spilled.
- Notify appropriate authority – spills of a reportable quantity must be reported to the appropriate agency. Minor spills should be reported to the EM.
- Record the incident – make a note of what, how and where the incident happened as well as what was done to clean it up. Depending on the spill, further assessment of the impact to land and water and/or additional cleanup may be required.

It is important to clarify in the CEMP that when reporting a spill, the caller should be prepared to provide the dispatcher with the following information, as accurately as possible:

- Name and contact phone number of the person initiating the call
- Name and telephone number of the person who caused the spill
- Location and time of the spill
- Type and quantity of the substance spilled
- Cause and effect of the spill
- Details of action taken or proposed
- Description of the spill location and surrounding area
- Names of agencies/responders on scene
- Names of other persons or agencies advised or to be advised concerning the spill

A CEMP is expected to include measures to be implemented as part of the spill response plan such as:

- *Identification of any/all hazardous materials/products as well as waste storage and secondary containment. Safety Data Sheets (SDS) will be kept on site and made available to all construction team members.*
- *Identification of the locations of spill response equipment and materials for containment and cleanup (spill kits and contents) as well as instruction on how to use them effectively. Locations of product/material storage and spill kits will be readily identified on a figure or map and posted in an appropriate location on site.*
- *Holding pre-construction meeting to identify all materials of a deleterious nature that could be spilled.*

5.7. Fuel management plan

The CEMP should identify specific location(s) for equipment re-fueling and show this on a site plan. The fuel management plan should provide a bulleted list of measures being incorporated during construction to ensure the receiving environment is adequately protected from construction-related fuels and products on site.

Example best practices include:

- *Equipment will not be fuelled within 30 m of a waterbody. If possible, one area will be designated for fuel transfer. Refueling will occur on a flat surface to minimize potential off-site runoff.*
- *All fuels, oils, lubricants and other petrochemical products will not be stored within 30 m of any waterbody.*
- *Refueling equipment and tanks will be clean and in good working order. Fuel tanks will be situated within appropriate secondary containment (an impermeable containment facility capable of holding 110% of the storage tank contents). This may be achieved through the use of double-walled storage tanks or sit-in containers constructed out of impermeable material, such as aluminum or plastic.*

5.8. Waste management

The permit holder is expected to give consideration to the end destination of all products and materials brought to their construction site. This will include hazardous wastes such as fuels and lubricants and their empty containers following use, as well as used oily rags and used spill kit products, but also non-hazardous construction wastes and general refuse (wood, cigarette butts, coffee cups, water bottles, etc.). A plan to deal with such wastes must form part of the CEMP and should include procedures for measuring, minimizing, reusing, recycling, and/or properly disposing waste generated during the project. A list of best practices can be incorporated into the CEMP, along with a figure identifying specific locations for waste collection and sorting, as appropriate. Example best practices include:

- *Contractors are expected to adhere to all applicable legislation with respect to the handling, transportation, and/or disposal of all materials related to this project (waste or otherwise). These regulations may include (but not be limited to) the BC Hazardous Waste Regulations, Spill Reporting Regulations, Workers Compensation Board Regulations, Transportation of Dangerous Goods Regulations, etc.*
- *Hazardous wastes generated could include waste petroleum products (engine oils, lubricants) from machinery and equipment, spent batteries, solvents and cleaning agents, etc. Contractors will provide labelled separate container(s) for potentially hazardous waste such as oily rags and hydrocarbon absorbent pads.*
- *All hydrocarbon products and other hazardous wastes potentially present during project activities will be identified and the associated Workplace Hazardous Materials Information System (WHMIS) and Safety Data Sheets (SDS) made available to all construction team members.*
- *All recyclable or compostable materials will be collected separately from general waste as per Metro Vancouver Regional District requirements.*

6. Definitions

Applicant means the party responsible for submitting a project permit application to the port authority on behalf of the holder of valid tenure on the subject port property. In the case of a port authority-led project, the project applicant would be the port authority employee or other designated representative responsible for the proposed project on behalf of the port authority.

Best Management Practice (BMP) means an approach based on known science that, if followed, should allow the activity to meet the required standard(s) or achieve the desired objective(s). BMPs take the form of a schedule of activities, prohibitions of practices, maintenance procedures, and other management techniques to prevent or reduce impacts to the environment.

Environmental monitor (EM) means a qualified environmental professional engaged in environmental monitoring on behalf of the permit holder for the purposes of compliance, due diligence and guidance on implementing mitigation measures.

Habitat means (a) in respect of aquatic species, spawning grounds and nursery, rearing, food supply, migration, and any other areas on which aquatic species depend directly or indirectly in order to carry out their life processes, or areas where aquatic species formerly occurred and have the potential to be reintroduced; and (b) in respect of other wildlife species, the area or type of site where an individual or wildlife species naturally occurs or depends on directly or indirectly in order to carry out its life processes or formerly occurred and has the potential to be reintroduced.

Independent Monitor means a qualified professional engaged by the permit holder, but responsible for independently observing, documenting and reporting information to the port authority and making recommendations to assist permit holders in complying with their permit.

Noise means environmental noise pollution as it relates to ambient sound levels beyond the comfort levels caused by traffic, construction, industrial and some recreational activities.

Permit holder means the party who receives a project permit from the port authority and is responsible for complying with permit conditions.

Qualified environmental professional (QEP) means an applied scientist or technologist who is registered and in good standing with an appropriate BC professional organization or who, through demonstrated suitable education, experience and knowledge relevant to the particular matter, may be reasonably relied on to provide advice within their area of expertise. A qualified environmental professional could be a biologist, agrologist, forester, geoscientist, engineer, or technologist.

Sound level means a measure of sound pressure that is frequency-weighted and time-averaged for the purposes of reporting in the units of decibels (dB).

Species at risk means species designated as extirpated, endangered, threatened or of special concern in Appendices 1 through 3 of the *Species at Risk Act*.

Waterbody includes a lake, canal, reservoir, ocean, river and its tributaries and wetland, up to the annual high-water mark, but does not include a sewage or waste treatment lagoon or a mine tailings pond.

Wildlife means a species, subspecies, variety, or geographically or genetically distinct population of animal, plant, or other organism, other than a bacterium or virus, that is wild by nature and (a) is native to Canada; or (b) has extended its range into Canada without human intervention and has been present in Canada for at least 50 years.

7. Notes/links to other documents

These guidelines are to be used in conjunction with the port authority's Project and Environmental Review Application Guide. Legislation such as the *Fisheries Act, Migratory Birds Convention Act* and *Species at Risk Act*, may also be relevant.

8. Contact information

If you require clarification, or assistance with respect to any of these guidelines, please contact Vancouver Fraser Port Authority staff who are available to help. Environmental Programs can be contacted as follows:

Phone: 604.655.9082 General Environmental Programs line

Email: EnvironmentalPrograms@portvancouver.com

9. Updates

These guidelines are available for viewing and downloading from our website (www.portvancouver.com). To ensure that you are referring to the most up-to-date document, please reference the version date clearly indicated on the front page.

Appendix 1: Content for environmental monitoring reports

Unless otherwise approved by the port authority, environmental monitoring reports will include, at a minimum, the following information:

- Name(s) of EM(s)
- Period covered by the report
- Date the report was submitted
- Report recipient(s)
- Contractor(s) undertaking work during the reporting period
- Overall weather conditions during the reporting period
- Description and photos of key project activities
- Summary of observations made by the EM, including a description of environmental issues or concerns raised by the EM and the measures taken to address those issues or concerns
- A summary of environmental incidents that may have occurred during the reporting period
- Additional content which may be applicable to the project includes:
  - A summary of environmental monitoring data collected and all results received during the reporting period, such as water and sediment sampling
  - A map showing the location of the monitoring activities and the area of active construction
  - An organized checklist or table of key mitigation requirements of the CEMP and/or applicable permit conditions verifying implementation and effectiveness at the relevant stages of the project
  - A list of meetings and other communications and a summary of key issues discussed
  - An overview of marine mammal, fish or wildlife observations, and potential negative interactions with construction activities

Appendix 2: Example of the port authority permit conditions

The following example permit conditions are provided for reference only and are not an exhaustive list. Individual permits will include additional customized conditions based on the potential for project-related activities to generate impacts of concern.

Best practices

Where applicable to the project, mitigation measures and management practices that address the following should be described in the CEMP:

Activities in or over water

(1) The permit holder shall not permit sediment, sediment-laden waters, or other deleterious substances to enter the water during the project. The permit holder shall carry out all physical activities in a manner that prevents induced sedimentation of foreshore and near shore areas and induced turbidity of local waters, and the release of sediment, sediment-laden waters, and turbid waters to the aquatic environment. The permit holder shall manage turbidity in compliance with the following water quality criteria:

a) when background is less than or equal to 50 nephelometric turbidity units (NTU), induced turbidity shall not exceed 5 NTU above the background values
b) when background is greater than 50 NTU, induced turbidity shall not exceed the background values by more than 10% of the background value

For the purposes of this condition, “background” means the level at an appropriate adjacent reference site (as determined to the satisfaction of the Port Authority) that is affected neither by physical activities at the project site, nor sediment-laden or turbid waters resulting from physical activities at the project site.

Rip rap shall be clean and free of fines and shall be lowered through the water column and deposited near the river/seabed and not dumped or deposited from above or near the water surface. The permit holder shall remove piles completely by extracting the entire length of pile from the river/seabed. If physical conditions result in the breakage of piles, the permit holder shall remove the remaining pile stubs with the least amount of disturbance of the river/seabed as possible. Should it be impossible to remove the remaining pile stubs, they are to be cut as close as possible to the nominal bed elevation in the immediate area of each pile. Upon successful completion of the pile extraction work, the location shall be surveyed and the location coordinates provided to the port authority within five days of project completion.

(2) The permit holder shall follow all applicable legislation, guidelines, and best management practices with respect to the application of wood preservatives and any other paints or coatings. Where practicable timber preservatives are to be applied upland in the dry prior to installation to allow the preservative to completely absorb and prevent leaching into the aquatic environment. A minimum of 45 days or compliance with wood treatment industry best management practices is generally required to satisfy this criterion. This condition applies to initial construction and to subsequent maintenance. The Permit Holder may wish to refer to the Fisheries and Oceans Canada (DFO) Guidelines to Protect Fish and Fish Habitat from Treated Wood Used in Aquatic Environments in the Pacific Region (Hutton, K.E. and S.C. Samis. 2000. Can. Tech. Rep. Fish. Aquat. Sci. 2314: vi + 34 p).

(3) The permit holder shall ensure that dredged material that is intended for upland placement complies with all applicable legislation and regulations. The permit holder shall appropriately manage any contamination associated with the dredged material and maintain records of off-site disposal.

(4) The permit holder shall screen water intakes placed in the Fraser River in accordance with the Fisheries and Oceans Canada (DFO) "Freshwater Intake End-Of-Pipe Fish Screen Guideline", March 1995.

Activities near water (within 15 m of the high water mark) or affecting vegetation

(5) The permit holder shall carry out all works in the intertidal area in the dry, i.e., above the water surface.

(6) The permit holder shall use an environmentally clean excavator bucket. The bucket and any portion of the excavator arm that will be in contact with or near the water shall be cleaned of any residual hydrocarbons or other contaminants prior to the start of works.

(7) The permit holder shall use reasonable efforts to retain existing native riparian vegetation and native soil. Disturbance or clearing of vegetation shall be staged and strictly limited to that required for the project.

(8) The permit holder shall manage invasive plants in a manner that prevents their spread. Invasive plants and potentially affected materials, such as soil, shall be appropriately contained, collected and disposed of.

(9) Trees shall be felled by a qualified professional.

Upland activities

(10) If suspect contaminated materials are encountered, the permit holder shall contain, test and dispose of such materials at appropriate licensed off-site facilities and maintain records of off-site disposal. The port authority shall be notified of such activities and provided relevant documentation upon completion.

(11) The permit holder shall decommission any groundwater monitoring wells encountered within the Project footprint in compliance with the requirements set out in Appendix 3 of the port authority’s Construction Environmental Management Plan Guideline.

(12) The permit holder shall carry out all activities in a manner that prevents the release of sediment, sediment-laden waters, and turbid waters to the aquatic environment. Sediment and erosion control measures shall be implemented prior to the start of ground disturbance activities and should meet or surpass the standards outlined in the 1992 Fisheries and Oceans Canada (DFO) “Land Development Guidelines for the Protection of Aquatic Habitat”.

(13) Prior to commencing construction or any physical activities, the permit holder shall have in place a spill prevention, containment, and clean-up plan for hydrocarbon products (including fuel, oil, and hydraulic fluid) and any other deleterious substances. Appropriate spill containment and clean-up supplies shall be available on the project site at all times and all personnel working on the project shall be trained on the spill prevention, containment and clean-up plan. The permit holder shall carry out the project in accordance with the spill prevention, containment and clean-up plan.

Waste management and equipment

(14) The permit holder shall contain and collect debris and waste material in the immediate working area within the project site. The permit holder shall dispose of waste material at suitable upland locations and maintain records of off-site disposal.

(15) The permit holder shall develop and implement a Waste Management Plan with procedures for measuring, minimizing, reusing, recycling, and/or properly disposing waste generated during the project. The Waste Management Plan may be integrated into the CEMP, where appropriate.

(16) The permit holder shall dispose of any soils excavated from the project site that are not suitable for backfill at appropriate off-site facilities and maintain records of off-site disposal.

(17) The permit holder shall maintain equipment in good mechanical condition and free of fluid leaks, invasive species, and noxious weeds.

(18) During upland construction activities, the permit holder shall not conduct refueling or maintenance activities on non-road equipment within 30 metres of any waterbody, or in an area where run-off may potentially reach surface waterbodies. Fuel and other hydrocarbon inventories shall not be stored in such areas, temporarily or otherwise.

(19) Air emissions from vehicle/equipment exhaust, dust and vapours shall be minimized and managed to avoid effects on and off the project site. More detailed guidance is available in Best Practices for the Reduction of Air Emissions from Construction and Demolition Activities prepared for Environment Canada (Cheminfo Services Inc. March 2005).

(20) All non-road diesel equipment in use within the port authority jurisdiction shall be reported as required under the Non-Road Diesel Emissions Program (https://www.portvancouver.com/environmental-protection-at-the-port-of-vancouver/climate-action-at-the-port-of-vancouver/non-road-diesel-emissions-program/).

Restrictions and limitations

Unless otherwise specifically authorized by the port authority or another authority having jurisdiction, the following restrictions and limitations must be met in addition to the applicable requirements described above:

(21) The permit holder shall not, directly or indirectly: (a) deposit or permit the deposit of a deleterious substance of any type in water frequented by fish in a manner contrary to Section 36(3) of the *Fisheries Act*; or (b) adversely affect fish or fish habitat in a manner contrary to Section 35(1) of the *Fisheries Act*.

(22) There shall be no in-water works during the fisheries sensitive period from March 1 to July 15, inclusive, in the Fraser River, or from March 1 to August 15, inclusive, in Burrard Inlet, unless otherwise approved in writing by DFO or the port authority. The port authority shall be notified of any DFO exemptions allowing works within the fisheries sensitive period.

(23) Piles shall be driven with a vibratory or drop hammer. Piles shall not be installed using a diesel or hydraulic hammer or other technology such as drilling without review and authorization by the port authority.

(24) The permit holder shall immediately cease work and notify the port authority if the permit holder has reasonable grounds to believe that the project has harmed fish or fish habitat, including observation of distressed, injured, or dead fish. The permit holder shall not resume work until authorized by the port authority.

(25) Sediments contained within piles after driving shall be left in place. If it is determined that they must be removed for engineering reasons, the permit holder shall consult the port authority for review and authorization prior to initiating the proposed physical activities.

(26) The permit holder shall not operate machinery or equipment on the intertidal foreshore. All equipment working on or near the top of bank shall not disturb intertidal areas or the river/seabed.

(27) The permit holder shall not disturb the river/seabed outside the project site.

(28) The permit holder shall contain any drilling fluids or mud used during the project within drill casings. Drill cuttings and drilling fluids/mud shall not be discharged to the aquatic environment.

(29) The permit holder shall not release chlorinated water, paint chips, cleaning products, coatings, or other potentially deleterious materials to the aquatic environment. The objective shall be 100% containment of all removed paint and other residues.

(30) The permit holder shall conduct all activities involving the use of concrete, cement, mortars and other Portland cement or lime-containing construction materials in a manner that shall not deposit sediments, debris, concrete (cured or uncured), and concrete fines to the aquatic environment, either directly or indirectly. Water that has contacted uncured or partly cured concrete or Portland cement or lime-containing construction materials (such as the water that may be used for exposed aggregate wash-off, wet curing, equipment and truck washing) shall not be permitted to enter the aquatic environment. The permit holder shall provide containment facilities at the site for the wash-down water from concrete delivery trucks, concrete pumping equipment, and other tools and equipment, as required.

(31) The permit holder shall not dewater excavations unless a dewatering plan has been reviewed and accepted by the port authority.

Appendix 3: Monitoring well decommissioning

Unless otherwise approved or required by the port authority, the following conditions apply to decommissioning groundwater monitoring wells:

(1) The person responsible for decommissioning a well must:

a) if practicable, remove from the well the well pump and all other equipment and instrumentation
b) fill the well throughout its depth with layers of sealant and backfill materials in a manner that precludes any lengthwise movement of liquids

(i) within the well,
(ii) in any visible annular space between the outer casing and the surrounding geological formation, and
(iii) between casings,

c) seal off all known aquifers and known water-bearing zones within an aquifer to prevent mixing of groundwater from different aquifers or different water-bearing zones within an aquifer, and
d) install a closure plug that is at least 1 m in length and, if the depth of the well is insufficient to have a closure plug length of 1 m, the greatest possible length up to 1 m.

(2) The person responsible for decommissioning a well may leave casings in place.

(3) If there is a potential for entry of liquids into a well, the person responsible for decommissioning the well must fill any entry points or openings with sealant.

(4) The person responsible for decommissioning a well must ensure that:

a) the uncased portion of the well has layers of sealant that are

(i) at least 1 m in length, and
(ii) separated by not more than 6 m of backfill materials, and

b) all sealant is placed in the well in a manner that ensures the physical integrity and continuity of the seal.

(5) A closure plug may extend to within 0.3 m of the surface of the ground to allow for up to 0.3 m of backfill materials above the closure plug, but the total length of the closure plug must not be less than 1 m in length and, if the depth of the well is insufficient to have a closure plug length of 1 m, the greatest possible length up to 1 m.