

Turning Dolphin Removal, Bella Coola Small Craft Harbour Bella Coola, BC Construction Environmental Management Plan

Prepared for:

Small Craft Harbours, Fisheries and Oceans Canada
200-401 Burrard Street
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Project No. 106524-01

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1.0 INTRODUCTION

BC Ferry Services Inc. (BCF) proposes upgrades to berth infrastructure at the Bella Coola Ferry Terminal. BCF has a lease agreement with Bella Coola Harbour Authority to operate and moor vessels within the Bella Coola Small Craft Harbour. BCF uses a deteriorated ferry turning dolphin, owned by Small Craft Harbours (SCH), Department of Fisheries and Oceans (DFO), that requires removal before the new floating turning dolphin can be installed (the Project). The berth currently provides ferry access from Bella Coola to Ocean Falls, Bella Bella (McLoughlin Bay), and Port Hardy (Bear Cove). The Project Site is located 2.5 km west of Bella Coola, BC, along the MacKenzie Highway 20 (Chilcotin-Bella Coola Highway) (**Figure 1**).

Project Activities include the removal and disposal of the existing turning dolphin, with the exception of the new BCF hydraulic fender pile and two stiff arms. All construction will occur from a barge or through the use of a certified dive crew. Hemmera Envirochem Inc. (Hemmera) was retained by SCH to develop a Construction Environmental Management Plan (CEMP) for the Project.

1.1 Purpose and Use of Construction Environmental Management Plan

The CEMP describes how the Project will be managed during construction to avoid adverse impacts to the environment. The CEMP will outline the existing environmental values at the Site that have the potential to be impacted by construction activities. Measures to be implemented to mitigate environmental impacts are described.

The plan contains emergency contact numbers and procedures as well as product information for use by the Contractor throughout the Project. **It is the Contractor's responsibility to ensure that subcontractors and employees are familiar and comply with the contents of the CEMP.**

The CEMP is considered a *living document* that will be updated over the course of the Project, as required. The most recent version of the CEMP will be retained on Site during the works for reference.

1.2 Roles and Responsibilities

The effective environmental management of this Project requires a coordinated effort from all individuals involved. The following **Table 1** identifies the responsibilities of key personnel on the Project.

Table 1 Roles and Environmental Responsibilities of Key Personnel

Role	Responsibility
Project Manager / SCH Representative	<ul style="list-style-type: none"> • Ensures the CEMP is prepared, communicated, accepted, and implemented by relevant staff and contractors (may delegate this responsibility). • Ensures that environmental incidents are addressed and reported. • Communicates work requirements to the Contractor. • Monitors Contractor(s) compliance with the contract documents. • Able to stop work to ensure compliance with regulatory or contract requirements.
Contractor	<ul style="list-style-type: none"> • Adheres to work instructions and requirements set out in this CEMP. • Communicates environmental responsibilities and requirements of this CEMP to Contractor's crew and sub-contractors. • Ensures all members of crews and sub-contractors are trained to prevent or mitigate any impacts. • Corrects deficiencies and any non-compliance upon direction from the SCH Representative.
Environmental Monitor	<ul style="list-style-type: none"> • Communicates requirements of the CEMP to the SCH Representative and Contractor. • Completes and records environmental pre-job/tailboard orientation with the Contractor. • Audits Contractor(s) compliance with the CEMP. • Conducts environmental monitoring and marine mammal monitoring during all Project Activities that may result in potential adverse effects to fish and fish habitat.

1.3 Environmental Incident Reporting (EIR)

All environmental incidents will be immediately reported to the SCH Representative and/or the Environmental Monitor (EM). Environmental incidents can occur both on land and in water. Examples of environmental incidents include, but are not limited to:

- Discharges of deleterious substances (i.e., suspended sediments, concrete wash water, fuel, oil or other potentially hazardous chemicals) into fish bearing waterbodies.
- Land alterations with the potential to adversely affect environmental quality (i.e., erosion of exposed surfaces, flooding, uncovering of contaminated soil and depositing of contaminated soils to uncontaminated areas, archaeologically sensitive features).

An environmental incident has the potential to cause damage to aquatic or terrestrial habitat or harmful effects to environmental resources (i.e., fish, wildlife, or aquatic environment) which may result in a violation under the *Fisheries Act*. It is important to ensure measures are in place to mitigate the potential for environmental damage and to monitor for compliance with regulatory permits and guidance.

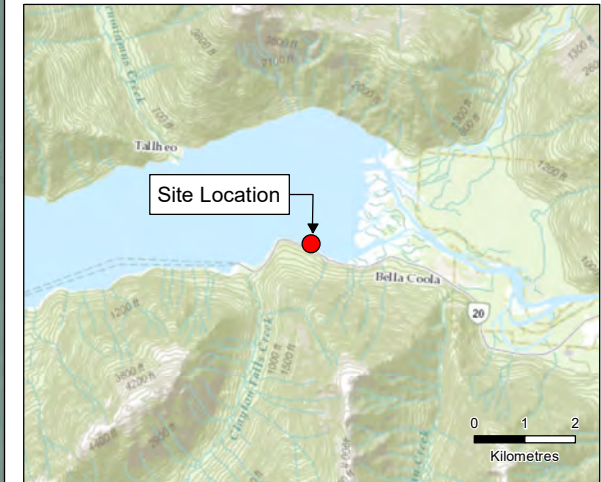
An Environmental Incident Report (EIR) will be prepared and submitted by the EM to the SCH Representative within 24 hours following any environmental incident.

The EIR will include the following information (as a minimum):

- Date, time, location of incident.
- Who reported, who responded, personnel present, actions taken to mitigate the effects.
- Details of the incident (i.e., substance released, environment affected, area).
- Spill information (i.e., fluid type, total released from primary containment, total released to soil/water, total recovered, potential total released).
- Preventative/follow up measures implemented following the incident.

In some situations, it may be necessary, to notify regulatory agencies (e.g., Fisheries and Oceans Canada (DFO), Environment and Climate Change Canada (ECCC)), Provincial regulators, local environmental representatives, or neighboring properties. The SCH Representative or EM will coordinate these notices.

Project Site



Legend

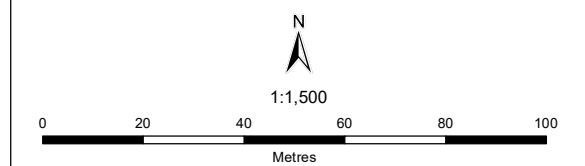
- Project Site
- Ferry Route
- Property Line

Notes

1. All mapped features are approximate and should be used for discussion purposes only.
2. This map is not intended to be a "stand-alone" document, but a visual aid of the information contained within the referenced Report. It is intended to be used in conjunction with the scope of services and limitations described therein.

Sources

- Contains information licensed under the Open Government Licence(s) - British Columbia
- Aerial Image: ESRI World Imagery
- Inset Basemap: ESRI World Topographic Map



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1.4 Emergency Contacts and Key Project Personnel

In case of incidents or emergency, site personnel will consult the numbers listed in the table below.

Table 2 Project and Emergency Contact List

Role	Name	Company	Office #	Cell #
SCH Project Manager	Jonathan Appleton	Small Craft Harbours	n/a	(604) 351-7604
BCF Project Manager	Benjamin Rhyno	BC Ferry Services Inc.	(250) 978-1182	(250) 812-3622
Environmental Project Manager	Anya Weare	Hemmera	(250) 388-3584	(587) 580-8095
Contractor	TBD	TBD	TBD	TBD
Environmental Monitor	TBD	TBD	TBD	TBD
Provincial Emergency Program (PEP)	n/a	Emergency Management BC (EMBC)	1 (800) 663-3456	n/a
DFO Emergency Number	n/a	Fisheries and Oceans Canada (DFO)	1 (800) 465-4336	n/a

1.5 Project Description

1.5.1 Location

The Project Site is situated along the MacKenzie Highway 20 (Chilcotin-Bella Coola Highway), 2.5 km west of Bella Coola, BC at the Bella Coola Ferry Terminal (Block B, District Lots 1400, 1940, Range 3 Coast District) (**Figure 1**).

1.5.2 Key features of the Project

Project Activities include removal and disposal of the existing ferry turning dolphin on Site, specifically:

- Concrete topped platform;
- Steel framed creosote timber fender wall; and,
- Approximately 51 steel piles.

The new BCF hydraulic fender pile and two stiff arms will be protected and remain in place unless advised by the SCH Representative. Additionally, the Contractor may be responsible to provide a derrick, tug and crew for float reconstruction, and replacement of 0.30 m (12 in) diameter timber piles. This is an optional item that may or may not be executed, at the discretion of SCH.

Drawings are provided in the **Tender Documents**. All construction activities will occur from a barge or through the use of a certified dive crew. Existing piles will be removed by vibro hammer or cut at the mudline if full removal is not possible. If new timber piles are installed, a combination of vibro hammer and drop hammer will be used. The Project is anticipated to take approximately 2–4 weeks. The construction methodology will be determined by the Contractor, in consultation with the SCH and BCF Representatives and Environmental Monitor (EM).

2.0 ENVIRONMENTAL SETTING

The environmental setting and a summary of environmental sensitivities at the Project Site is provided below.

2.1 Characteristics of the Project Site

The Site is located along the south shore at the eastern end of North Bentinck Arm, 2.5 km west of the community of Bella Coola, BC (**Figure 1**). Infrastructure east of the Site is managed by the Bella Coola Harbour Authority and includes moorage for commercial and recreational vessels, floats and equipment to service fishing vessels, fuel, laundry and shower facilities, and a boat launch and parking area. A riprap breakwater is located approximately 100 m west of the ferry terminal.

The Project Site is in the Coastal Western Hemlock moist subarctic (CWHms2) biogeoclimatic zone. The CWH zone occurs at mid to low elevations, generally west of the coastal mountains and typically has cool summers and mild winters. Mean temperature ranges from -6.6 to 4.7°C. It is the rainiest biogeoclimatic zone in BC, with annual precipitation ranging from 1000 to 4400 mm (Pojar et al. 1991). Weather and climatic conditions for the Bella Coola area are summarized in **Table 3**.

Table 3 Climate Summary

Climate Zone	Pacific Maritime Ecozone
Average Temperature Range	-5°C to 14°C
Average Total Annual Precipitation	2649 mm
Weather Forecasts	www.weather.gc.ca ; www.theweathernetwork.com
Weather Phone (Environment Canada)	1-833-794-3556 (79HELLO) Code: 08018 (Bella Coola)
Weather Notices (Environment Canada)	https://weather.gc.ca/marine/region_e.html?mapID=01 (North Coast)

(Environment Canada 2022)

North Bentinck Arm is in Fisheries Management Area 8, Subarea 11 and due to risk of biotoxins, bivalve shellfish harvesting is permanently closed (DFO 2020). The Site is protected within North Bentinck Arm, a mainland fjord, with very low tidal currents (0.001-0.045 m/s; BCMCA 2022). Along with other smaller watercourses, the salmon-bearing Bella Coola and Necleetsconnay Rivers, and Clayton Falls Creek are located within 2.1 km of the Site, providing a freshwater influence on the area (HabitatWizard 2022).

Along with other fish species, chinook (*Oncorhynchus tshawytscha*), chum (*O. keta*), coho (*O. kisutch*), and pink (*O. gorbuscha*) salmon have been recorded in the Bella Coola River within the last 25 years (HabitatWizard 2022). The Bella Coola River has both spring and fall spawning species (FLNRORD 2011).

The foreshore of the Site is armoured with riprap that extends into the intertidal area. Subtidal marine substrate at the Site is described as mud (i.e., silts and clays) (BCMCA 2022). As shown on aerial imagery, the Bella Coola River, located approximately 1.2 km east of the Site, introduces sediment as a plume to North Bentinck Arm.

Salt marsh habitat was identified at the Bella Coola River estuary (~1.2 km east), however, no sensitive habitats were identified at the Project Site, including eelgrass and kelp beds (iMapBC 2022, BCMCA 2022). The area is classified as low for Pacific herring (*Clupea pallasii*) spawning habitat (BCMCA 2022).

2.2 At-Risk Species and Habitats

Federally, the *Species at Risk Act* (SARA) prohibits the killing, harm, harassment, and capture of a species listed on Schedule 1 of SARA as *Extirpated*, *Endangered*, or *Threatened* as per Sections 32 of SARA. Additional provisions are contained in SARA that prohibit the damage or destruction of the residence of one or more individuals listed on Schedule 1 of SARA (Section 33). Furthermore, the destruction of critical habitat of listed species as identified in the recovery strategy or action plan for that species is prohibited under Section 58(1) of SARA.

The Red list includes species that have been legally designated as Endangered or Threatened under the *Wildlife Act*, are extirpated, or are candidates for such designation. The Blue List includes species not immediately threatened, but of concern because of characteristics that make them particularly sensitive to human activities or natural events. The Yellow List includes uncommon, common, declining and increasing species (BC CDC 2002).

The BC Conservation Data Centre (CDC) and DFO's Aquatic Species At-Risk online databases were consulted to evaluate at-risk species that could be found in the Project area. Mammals, birds, fishes, invertebrates, and reptiles, along with their likelihood to interact with the Project are summarized in **Table 4**. The Project Site does not overlap with Critical Habitat that has been defined under SARA for the species identified.

Table 4 At-Risk Species that may occur at or near the Project Site.

Common Name	Scientific Name	SARA	BC List ¹	Potential to Interact with Project
Marine Mammals				
Harbour Porpoise	<i>Phocoena phocoena</i>	Special Concern	Blue	Unlikely; outside typical distribution range.
Humpback Whale	<i>Megaptera novaeangliae</i>	Special Concern	Blue	Possible; documented occurrence in North Bentinck Arm.
Killer Whale (Transient [Bigg's])	<i>Orcinus orca</i> pop. 3	Threatened	Red	Possible; Site is within the range, however, no recorded occurrences in Bentinck Arm.
Killer Whale (Northern Resident)	<i>Orcinus orca</i> pop. 6	Threatened	Red	Possible; Site is within the range, however, no recorded occurrences in Bentinck Arm.
Steller Sea Lion	<i>Eumetopias jubatus</i>	Special Concern	Blue	Unlikely; Site is not near known rookeries or haul-out sites.
Birds				
Ancient Murrelet	<i>Synthliboramphus antiquus</i>	Special Concern	Blue	Unlikely; not expected to occur, breeding occurs farther north and non-breeding birds are mainly offshore or pelagic.
Barn Swallow	<i>Hirundo rustica</i>	Threatened	Blue	Possible; occurrences in the Bella Coola area.
Band-tailed Pigeon	<i>Patagioenas fasciata</i>	Special Concern	Blue	Possible; an occurrence in the Bella Coola River valley.

Common Name	Scientific Name	SARA	BC List ¹	Potential to Interact with Project
Caspian Tern	<i>Hydroprogne caspia</i>	None	Blue	Unlikely; outside typical range.
Common Nighthawk	<i>Chordeiles minor</i>	Threatened	Yellow	Possible; potential foraging habitat in the Bella Coola area.
Great Blue Heron	<i>Ardea herodias fannini</i>	Special Concern	Blue	Possible; potential foraging habitat at Bella Coola River estuary.
Marbled Murrelet	<i>Brachyramphus marmoratus</i>	Threatened	Blue	Possible; critical habitat located in old growth forest south of the Site.
Northern Goshawk	<i>Accipiter gentilis laingi</i>	Threatened	Red	Possible; occurrences in the Bella Coola area.
Marine Fishes				
Eulachon	<i>Thaleichthys pacificus</i>	None	Blue	Possible; numbers of eulachon spawning in the Bella Coola River has been increasing.
Green Sturgeon	<i>Acipenser medirostris</i>	Special Concern	Blue	Unlikely; outside typical distribution range.
Longspine Thornyhead	<i>Sebastes altivelis</i>	Special Concern	None	Unlikely; not expected as Project area is shallower than typical depth range.
Rougheye Rockfish type I	<i>Sebastes sp. Type I</i>	Special Concern	None	Unlikely; not expected as Project area is shallower than typical depth range.
Rougheye Rockfish type II	<i>Sebastes sp. Type II</i>	Special Concern	None	Unlikely; not expected as Project area is shallower than typical depth range.
Yelloweye Rockfish	<i>Sebastes ruberrimus</i>	Special Concern	None	Unlikely; not expected as Project area is shallower than typical depth range.
Marine Invertebrates				
Northern Abalone	<i>Haliotis kamtschatkana</i>	Endangered	Red	Unlikely; not expected due to lack of suitable habitat.
Olympia Oyster	<i>Ostrea conchaphila</i>	Special Concern	Blue	Unlikely; not expected due to lack of suitable habitat.
Marine Reptiles				
Leatherback Sea Turtle	<i>Dermochelys coriacea</i>	Endangered	Red	Unlikely; not expected due to lack of suitable habitat.
Mammals				
Little Brown Myotis	<i>Myotis lucifugus</i>	Endangered	Yellow	Possible; potential foraging habitat in the area and potential nesting on nearby structures.

¹ BC List: Red = Species that are extirpated, endangered, or threatened; Blue = Species of special concern; Yellow = species and ecological communities that are secure.

A BC CDC iMap search shows marbled murrelet (*Brachyramphus marmoratus*) critical habitat in the Bella Coola area, with the closest suitable habitat approximately 350 m from the Site (**Figure 2**) (CDC iMap 2022). Marbled murrelets nest in solitary pairs at low densities. Nests are typically within 30 km of the ocean, however, nests have been located up to 50 km or more inland (SARA 2014). Preferred nesting habitat is in old-growth coniferous trees, but some have been found on mossy cliff ledges. Marbled murrelets spend most of their time over water, within 0.5 km of shore (SARA 2014).

Occurrences of the provincially blue-listed vascular plant, Chamisso's montia (*Montia chamissoi*), were recorded on the Bella Coola River floodplain. This species typically occurs in bogs, marshes and streambanks (E-Flora 2022). The last recorded observation of Chamisso's montia in the Bella Coola area was from 1956 (CDC iMap 2022).



Figure 2 Marbled murrelet critical habitat (yellow) and Chamisso's montia (green) recorded near the Project Site (red oval) (CDC iMap 2022).

After near extirpation in the Bella Coola River, the population of spawning eulachon began to increase in 2012 (COSEWIC 2011, Coast Funds 2018). Eulachon are a small fish that spends most of their lives in the ocean and returns to freshwater to spawn. These fish are significantly important to First Nations in coastal communities, as harvesting provides cultural, economic, nutritional, and social value (particularly the oil rendered from the fish) (COSEWIC 2011).

3.0 PROJECT COMPONENTS AND MECHANISMS WITH POTENTIAL TO AFFECT FISH AND FISH HABITAT

Proposed Project Activities with the potential to cause harmful alteration, disruption or destruction to fish or fish habitat include:

- Direct mortality or injury of biofouling organisms as a result of removing berth infrastructure components.
- Short-term avoidance of near shore habitat by marine fish, marine mammals, and mobile invertebrates due to increased underwater noise associated with construction.
- Short-term mobilization and movement of marine bottom sediments during Project Activities (e.g., pile removal) which can affect mobile marine organisms such as fish and can smother sessile (non-mobile) organisms.
- Impacts to water quality through increased potential of contaminants entering the marine environment from berth upgrades, and spills/leaks from barges and other equipment on Site during construction.

Mitigation measures for these potential effects are described in the following sections. A qualified Environmental Monitor (EM) will be assigned to monitor the Project Activities as described below and will be on Site for all phases of the work with the potential to affect fish and wildlife resources.

4.0 MITIGATION MEASURES

The mitigation measures below are intended to address and mitigate potentially adverse effects of the Project on fish and fish habitat at the Site.

4.1 Regulatory Requirements and Permits

General environmental regulatory requirements to complete the Project are outlined in **Table 5**.

Table 5 General Environmental Regulatory Requirements

Legislation	Environmental Conditions and/or Mitigation Measures
Federal	
<i>Fishing and Recreational Harbours Act</i> <i>Impact Assessment Act</i>	<ul style="list-style-type: none"> Small Craft Harbours is a nationwide program run by Fisheries and Oceans Canada (DFO) under the <i>Fishing and Recreational Harbours Act</i>. DFO Small Craft Harbours, as a federal authority, is also subject to the <i>Impact Assessment Act</i>. Section 82 of the <i>Impact Assessment Act</i> requires that an environmental review of works and activities are undertaken to determine that the project will not likely cause significant adverse environmental effects. A Section 82 <i>Impact Assessment Act</i> determination will be submitted to Small Craft Harbours.
<i>Canadian Environmental Protection Act</i>	<ul style="list-style-type: none"> The objective of the <i>Canadian Environmental Protection Act</i>, 1999 is to prevent pollution and protect the environment and human health.
<i>Fisheries Act</i>	<ul style="list-style-type: none"> DFO is responsible for administering the federal <i>Fisheries Act (FA)</i>. Section 34.4(1) prohibits the death of fish by means other than fishing. Section 35 prohibits the harmful alteration, disruption or destruction (HADD) of fish habitat. The <i>FA</i> defines other requirements to protect fish and fish habitat including safe passage (Section 20), and the prohibition of the introduction of deleterious substances (Section 36). Fish habitat, as defined by the <i>FA</i>, is “water frequented by fish and any other areas on which fish depend directly or indirectly to carry out their life processes, including spawning grounds and nursery, rearing, food supply and migration areas”. Fish, as defined by the <i>FA</i>, includes (but is not limited to) fish, shellfish, crustaceans, marine animals, eggs, sperm, larvae and juveniles. The Project will be submitted to DFO for review.
<i>Species at Risk Act</i>	<ul style="list-style-type: none"> Under the <i>Species at Risk Act</i>, 2002 (<i>SARA</i>) it is an offence to kill, harm, capture, or take an aquatic or migratory bird species if the species is listed as Endangered, Threatened, or Extirpated in Schedule 1 of <i>SARA</i>. It is also an offence to damage or destroy the residence of one or more individuals of a species listed in Schedule 1 of <i>SARA</i> as Endangered, Threatened, or Extirpated. On private land, prohibitions apply only to species also listed under the <i>Migratory Birds Convention Act</i>, 1994.
<i>Migratory Birds Convention Act</i> and its regulations	<ul style="list-style-type: none"> The <i>Migratory Birds Convention Act</i> protects various species of migratory birds including gamebirds, insectivorous birds, and non-gamebirds. This Act restricts the possession of live and dead migratory birds and bird parts and prohibits the taking of migratory bird nests and the deposit of harmful substances in water or areas frequented by migratory birds. To mitigate potential impact to migratory birds during construction, no disturbance to nests or nesting birds will occur during breeding and nesting periods as result of the Project (Note: early April to mid-August for the Bella Coola area).

Legislation	Environmental Conditions and/or Mitigation Measures
Provincial	
<i>Environmental Management Act</i>	<ul style="list-style-type: none"> The <i>British Columbia Environmental Management Act</i> (SBC 2003, c. 53) provides requirements for the regulation of activities that introduce waste into the environment, store special waste, and treat or recycle special waste. This Act establishes Contaminated Site Regulation, Hazardous Waste Regulation and provides a permitting system to enable the authorized disposal of solid waste (including soil), discharge of emissions, and discharge of wastewater and surface run-off.
<i>Wildlife Act</i>	<ul style="list-style-type: none"> Section 34 of the provincial <i>Wildlife Act</i> prohibits possessing, taking, or destroying (i) a bird or its egg, (ii) the nest of an eagle, peregrine falcon, gyrfalcon, osprey, heron, or burrowing owl, or (iii) the nest of a bird not mentioned in (ii), when the nest is occupied by a bird or its egg unless authorized under permit. The regional nesting period is from early April to mid-August for the Bella Coola area. If nesting birds are observed near the Project, consult a qualified environmental professional to ensure mitigation measures are in place to avoid impacts to the breeding birds.
<i>Heritage Conservation Act</i>	<ul style="list-style-type: none"> Except as authorized by a permit issued under Section 12 or 14, a person must not damage, remove, or alter a heritage object that is protected under the Act. An Archaeological Chance Find Procedure is provided in Appendix A.

4.2 Timing Windows

Through consideration of the seasonal distribution and abundance of fish and the timing of their sensitive life stages and processes (e.g., reproductive periods, migration of Pacific salmon), DFO identifies periods of lower (least) risk for the timing of in-water and near-water works. The Project Site is within DFO Fisheries Management Area 8. Timing windows of least risk for this area are:

- Summer Window: **N/A**
- Winter Window: **July 1 – February 28**.

Project Activities will be timed to occur within DFO’s least risk work windows, to avoid or limit possible adverse effects on fish and aquatic species during sensitive life history stages.

4.3 Work Zone, Access, and Laydown Areas

The following mitigation measures will be implemented:

- The Contractor, in consultation with the SCH Representative, will determine the site-specific boundaries of the construction and laydown areas prior to starting work to ensure no conflicts with other Site operations. Contractors will remain within the pre-determined areas at all times to avoid unnecessary disturbance.
- If an upland laydown area is required for machinery and materials, it will be located on flat, stable terrain. Machinery stored overnight will be placed atop poly sheeting or spill trays to catch drips or leaks. This area will be clearly delineated by flagging, fencing or other means to protect people in the area and nearby resources.
- No new trails or paths will be constructed apart from the predetermined laydown, access, and work areas.

4.4 Protection of Aquatic Life and Fish Habitat

4.4.1 Pile Driving and Underwater Noise Monitoring

Standard management and industry practices for underwater noise will be followed so sound levels that may cause harm to fish are not exceeded (BC MPDCA 2003; Vagle 2003). These practices are as follows:

- A vibratory hammer will be used when practical to reduce sound levels during pile removal and installation.
- A hydrophone will be used during start up of vibratory pile installation or removal, along with visual observations, to confirm assumptions and to verify that sound levels remain below the threshold for fish harm from pile driving (peak sound pressure level (SPL) 30 kPa, or approximately 206 dB re 1 μ Pa). The criterion will be applied up to a 10 m range from the activity, as suggested by DFO for previous projects generating underwater noise. Pile-driving activities generating peak SPL levels that exceed the threshold or that cause fish kills will be mitigated such that acceptable levels are reached (e.g., using mitigation measures such as bubble curtains). Hydrophone monitoring will be conducted during vibratory piling (removal or installation), for the time necessary to confirm that SPL is below the thresholds outlined above, after which vibratory pile driving may be continued with only visual monitoring of activities. Hydrophone monitoring will be resumed if there is a change in pile driving activities including; change in substrate, change in depth, change in pile size or material, or change in installation type (e.g., impact piling, rock socketing).
- During impact pile driving, hydrophone monitoring will be conducted for the duration of impact pile driving activities to confirm that SPL does not exceed 30 kPa, or approximately 206 dB re 1 μ Pa, at 10 m from the pile driving activities.
- A bubble curtain will be available on Site and will be installed by the Contractor if hydroacoustic impacts are at or near threshold limits. The bubble curtain will be installed over the full length of the wetted pile to reduce underwater noise levels and to reduce the likelihood of fish interacting too closely with the pile during driving operations (Tsouvalas and Metrikine 2016).
- All pile driving operations will stop and additional mitigation measures will be installed, in the event of a fish kill.

4.4.2 Marine Mammals

The following mitigation measures will be implemented:

- The Contractor will have a DFO qualified marine mammal observer (MMO; likely the EM) who has the authority to stop work if marine mammals appear to be affected by Project Activities.
- The MMO will scan the work area prior to the commencement of and during works and document the presence, number, and behaviour of marine mammals in the area. If marine mammals enter the Project area, the MMO will advise the Contractor to stop or modify construction activities until the mammals have cleared the area. Marine mammal exclusion zones and compliance distances will be established by the MMO prior to the start of relevant construction components such as impact pile driving.
- Marine mammal exclusion zones for impact pile driving will represent the minimum distance required for Project generated underwater water noise to return below auditory disturbance thresholds for marine mammals (160 dB re 1 μ P_{aRMS}). As such, industry standard practice marine mammal exclusion zones of 1000 m will be enforced (Vagle 2003).
- Works will be limited to daylight hours and during weather conditions with suitable visibility to observe marine mammals.
- If impacts to fish or marine mammals is observed, DFO requires immediate reporting through their Observe, Record and Report phone line (toll free) at 1-800-465-4336.

4.4.3 Water Quality, Sediment Control and Spills

Project Activities will require the use of machinery that uses fuels, lubricating oils, and hydraulic fluids and materials that would be considered deleterious if they enter fish bearing waters. The following measures will be implemented to protect water quality:

- Conduct water quality monitoring during in-water works to confirm turbidity levels in the water column are below guidelines established by the Canadian Council of Ministers of the Environment (CCME) and the BC Ministry of Environment and Climate Change Strategy (BC MOE).
- The turbidity guidelines for freshwater, marine and estuarine habitats, measured in Nephelometric Turbidity Units (NTU) will be applied during water quality monitoring and are as follows:
 - Change from the background of 8 NTU at any one time for a duration of 24 hours in all waters during clear flows or in clear waters (CCME 2002, BC MOE 2021).
 - Change from the background of 2 NTU at any one time for a duration of 30 days in all waters during clear flows or in clear waters (CCME 2002, BC MOE 2021).
 - Change from the background of 5 NTU at any one time when background is 8-50 NTU during high flows or in turbid waters (BC MOE 2021).
 - Change from background of 10% when background is greater than 50 NTU at any time during high flows or in turbid water (BC MOE 2021).
- If turbidity exceedances are encountered, work will be stopped and additional mitigation measures implemented prior to recommencing work (e.g., install silt curtains, slow work).
- Silt curtains, in suitable quantities for Project Activities, will be readily available on Site.
- All machinery will be cleaned in advance, be free of contaminants and be in good working condition to minimize losses of hydraulic fluids and lubricants. This will include regular inspections of fuel and hydraulic lines. Use biodegradable lubrication and hydraulic fluids.
- Petroleum product storage, transfer points and refuelling facilities for machines will be at accepted locations at least 30 m from the high-water mark of the marine environment.
- Equipment on barges will be stored with spill prevention materials in place (secondary containment, absorbent booms, spill pads) to eliminate the potential for any leaks to come in contact with the water.
- The Project Site and equipment will have emergency spill response kits (pads, sorbent booms, etc.) available. The kits will be suitable for the quantities and types of material stored at the Site and will have sufficient materials to contain any leaks from equipment or cables that are accidentally damaged or cut. Site personnel will be trained in the proper use of the spill response kits in the event of a spill. All spills to ground and water, will be contained and reported to the EM, who will report to relevant environmental agencies, as necessary.
- All debris and deleterious substances generated by demolition and construction associated with the Project will be appropriately contained in the immediate work area (i.e., through the use of sorbent booms or silt curtains), collected, and appropriately disposed of in accordance with all applicable legislation, guidelines, and best management practices.

4.4.4 Concrete and Grout Works

Concrete is toxic to fish due to its high alkalinity (pH). The following best management practices will be employed to minimize/prevent the impacts to water quality:

Grinding or cutting concrete

- When grinding or cutting cured concrete, the dust and fines entering the water will not exceed the allowable limits for suspended solids. When grinding green or incompletely cured concrete and the dust or fines are entering the water, pH monitoring will be conducted to ensure allowable ranges are maintained. In the event that the levels are outside the acceptable ranges, preventative measures will be introduced. This may include introducing silt curtains to contain the solids and prevent fish from entering a contaminated area or constructing catch basins to recover the run-off and neutralizing it prior to disposal.

New concrete and grout works are not anticipated for this Project but if the Contractor identifies the need to use concrete, the following mitigation measures will apply. Approval from SCH will be obtained prior to new concrete or grout works.

Pouring concrete

- All concrete work will conform to the requirements of CSA A23.1 and A23.2 (Concrete Materials and Methods of Concrete Construction/Methods of Test for Concrete) and follow the "Guide to the Code of Practice for the BC Concrete and Concrete Products Industry – Version 6", particularly Chapter 7 – Authorized Discharge: Effluent and Surface and Marine Water Quality (Millennium EMS Solutions Ltd. 1993).
- Uncured or wet concrete will be prevented from entering waterbodies, catch basins or other pathways to aquatic environments.
- Spills: When pouring concrete, all spills of fresh concrete will be prevented. If the concrete is being placed with a concrete pump or tremied into place, all hose and pipe connections will be sealed and locked properly to ensure the lines will not leak or uncouple. Crews will ensure that concrete forms are not filled to overflowing.
- Contain and test potentially high pH water emanating from areas where pours and other concrete or grouting works are recent or ongoing and, as warranted, either treat concrete affected water prior to release to receiving waters or remove it for off-site disposal to an approved facility.
- Carbon dioxide (CO₂) with regulators and diffusers, or in the form of dry ice, will be present on Site and be available for immediate deployment at all times when there is the potential for release of high pH water into a watercourse or waterbody.
- Train relevant construction personnel to use CO₂.
- Do not discharge concrete truck wash water directly to ground. Capture and remove wash water for treatment and disposal at an approved offsite facility (small quantities of wash water can be treated on Site).
- 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.
- Sealing forms: All concrete forms will be constructed in a manner which will prevent fresh concrete or cement-laden water from leaking into the surrounding water.

Curing concrete

- When fresh water is used to cure concrete, the run-off will be monitored for acceptable pH levels. If the pH levels are outside the allowable limits, then the run-off water will be contained and neutralized.

Washing hand tools, pumps, and transit mixer

- All tools, pumps, pipes, hoses, and trucks used for finishing, placing or transporting fresh concrete will be washed off in such a way as to prevent the wash water and excess concrete from entering the marine environment. The wash water will be contained and disposed of upland in an environmentally acceptable manner.
- Concrete washout will occur only in a designated area, as determined in consultation with the EM. The following measures related to concrete washout will apply:
 - The designated area will be a minimum of 30 m from any surface water sources and contained within an impervious container.
 - Any concrete wash water contained on Site will be held and treated (e.g., with carbon dioxide) until it reaches a neutral pH (6.5-8.5) and until it meets the BC and Canadian Water Quality Guidelines for Aquatic Life for total suspended solids.
 - Any release to the environment of treated waters will be via infiltration in an area that is isolated and does not flow into fish-bearing waters or natural wetlands.

4.4.5 Debris Management Plan

When dismantling infrastructure, the following best management practices will be employed to minimize/prevent impacts to water quality and personnel:

- Where possible, deploy booms around infrastructure during demolition to contain construction materials and debris (i.e., treated wood fragments, sawdust, cuttings, etc.). Contained materials will be collected and disposed of at an approved facility.
- Plan activities with the potential of generating airborne particles (e.g., sawdust) during periods of low wind.
- Any deconstructed materials that have the potential to cause contamination (e.g., creosote timber) will be placed and stored in a way that contaminants will not enter fish-bearing waterbodies (i.e., placed on >6 mil poly sheeting or in contained bins). These areas will be covered and protected from rain.

4.4.6 Subtidal Barge Works

The following mitigation measures will be implemented:

- Propeller scour of subtidal habitat by barges will be avoided. Barges will not ground during work. Movement and repositioning of barges will be minimized to reduce disturbance to the seabed (i.e., through use of spuds).
- If spawning Pacific Herring are observed within 1 km of the site during the spring spawning season, stop works immediately and consult the EM. If herring enter the site and spawn successfully, do not disturb spawn sites until the eggs hatch (approximately 10 days). This includes marine vegetation, piles and other materials and equipment that herring have deposited eggs on. Notify the EM immediately if herring egg masses are identified.
- Subtidal work will follow the same mitigation measures, where appropriate, outlined throughout **Section 4.0**. For example, adequate spill kits and floating boom are required to be accessible in the event of a spill.

4.5 Erosion and Sediment Control

Project Activities can present risks to the aquatic environment through the introduction of sediment-laden water into aquatic habitats, which can cause harm to fish and aquatic life by increasing total suspended solids and turbidity. No upland construction is anticipated; however, the following environmental protection and mitigation measures will be implemented to prevent deleterious substances from entering the marine environment:

- Structural materials and equipment entering the water will be free of silt, debris, or other deleterious substances.
- If a mitigation feature proves to be inadequate, the EM will be notified, and a new mitigation strategy will be implemented based on the specific site requirements.
- No mud or dust will be tracked onto civic lands or streets.

4.6 Equipment Operation and Maintenance

The following mitigation measures, as they relate to machinery and equipment, will be implemented:

- All machinery will be inspected for leaks or worn hoses, fittings, etc. prior to commencing the work. Repairs will be made prior to arriving at the site. Throughout construction, equipment will be in good operating condition to minimize losses of hydraulic fluids, lubricants or fuels. This will include regular inspections of fuel and hydraulic lines.
- Equipment or boats with fuel or fluid leaks, or excess oil or grease will not be permitted to work on site.
- Hazardous materials will be labelled and disposed of according to the Transportation of Dangerous Goods (TDG) Regulations.
- If machinery is working near or over water, use environmental hydraulic fluids if possible, which are free of heavy metals, non-toxic, and biodegradable. Readily biodegradable products (e.g., Cat® Bio HYDOTM Advanced, Panolin) are preferred as they have a biodegradation of more than 60 percent within 28 days. Inherently biodegradable products (e.g., Petro Canada EnvironMV, Chevron Clarity) would be accepted, although these biodegrade more slowly (20 to 59 percent in 28 days).
- If used, land-based equipment will be fueled and maintenance will be conducted a minimum of 30 m from the natural high-water mark of the sea. Fuel storage for land-based work will be limited to pickup truck-mounted refueling tanks (all delivery hoses will have shut-off capacity at the delivery nozzle) or jerry cans. Fuel containers stored in places other than the back of a pickup truck will be kept in a heavy-duty plastic (polyethylene) or sealed metal-lined storage box, or other appropriate secondary containment with a capacity of at least 110% of the source container.
- All generators/compressors used during the works are required to operate with secondary containment (e.g., metal trays, or plastic popup containment devices) with 110% capacity of the source container.
- A spill containment kit will be readily accessible on site and on each piece of equipment in the event of a release of a deleterious substance to the environment.

4.7 Active Ferry Terminal

- The Contractor will coordinate activities with BCF to ensure the safety of people in the area and the environment.

4.8 Wildlife and Wildlife Habitat

The following mitigation measures will be implemented:

- If work is completed during the breeding bird nesting period (early April to mid-August for Bella Coola area), there is a possibility birds may nest in or on the wharf infrastructure. A qualified environmental professional may be required if nesting birds are found in the work area. Breeding birds and their nests can not be disturbed or damaged under the *Migratory Birds Convention Act* and *Wildlife Act*.
- If any environmentally sensitive areas or habitat features (e.g., burrows, hibernacula, nests) are observed prior to construction, the EM will flag or stake buffers as to not disturb the area during construction.
- Deliberate interaction with wildlife will not be permitted (e.g., feeding, harassing, etc.). All wildlife sightings will be reported to the EM.
- Food scraps and other organic waste will be managed to avoid attracting wildlife to the Project Site. Nuisance wildlife and wildlife-vehicle collisions will be reported to the Conservation Officer Service at 1-877-952-7277.

4.9 Vegetation and At-Risk Species

No vegetation removal or ground disturbance is required to complete Project Activities.

In the event an at-risk species or ecological community of concern is discovered in the work or laydown areas, a mitigation plan will be developed and may include, but are not limited to the following measures:

- Protecting the area by staking, flagging and/or fencing.
- Narrowing or realigning the work area, if possible.
- Temporarily covering the site with geotextile pads or matting.
- Implementing access restrictions in the vicinity of the area.

4.10 Waste Management

The Contractor is responsible for appropriately disposing of Project-generated wastes during construction. Garbage can attract a variety of wildlife species, which may result in an increased risk of mortality due to negative wildlife-human interactions. The following are key mitigations to be implemented during construction:

- Waste will be reduced by reusing and recycling materials whenever possible. Reusable and recyclable materials will be segregated from other materials where applicable.
- All hydrocarbon products and other hazardous wastes potentially present during Project Activities will be identified and the associated Workplace Hazardous Materials Information System (WHMIS 2015) and Safety Data Sheets (SDS) made available to all construction personnel.
- Hazardous waste will be separated from non-hazardous waste, stored in appropriately labelled containers, and disposed of in accordance with WHMIS requirements, as set out in BC's Occupational Health and Safety Regulation of the *Workers Compensation Act*.
- Specific receptacles will be designated for proper disposal of oil-ridden materials, such as cloths used to wipe spills, oil cans, etc. These will be disposed of at an acceptable facility.

- Food material is to be kept in sealed containers, or inside the barge or cab of a vehicle. All personal waste (e.g., food and beverage debris) will be removed daily to minimize the potential for wildlife encounters at the Project Site. Littering will not be accepted.
- Use wildlife-proof trash containers.
- Collection and removal of all waste materials will follow federal (e.g., Transportation of Dangerous Goods Act) and provincial (e.g., Environmental Management Act) waste management legislation, including requirements regarding containment, handling, manifesting, and disposal.

4.11 Spill Response

Refer to the Fuel and Hazardous Material Spill Response Plan (**Appendix B**) in the event of a spill. Construction personnel will be trained to contain spills or leaks from equipment and be familiar with the location of spill kits.

In the event of a spill, immediately notify the EM and SCH Representative, as they will support clean-up and notify the required parties. Substances and quantities that require immediate spill reporting are provided in **Table 6**, as outlined in the *Environmental Management Act* Spill Reporting Regulation (BC Reg. 187/2017). Any spill that enters, or is likely to enter, a waterbody requires immediate reporting.

Table 6 Substances and Quantities for Immediate Spill Reporting

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

Item	Substance	Quantity
12	Class 8, Corrosives as defined in section 2.40 of the Federal Regulations	5 kg or 5 L
13	Class 9, Miscellaneous Products, Substances or Organisms as defined in section 2.43 of the Federal Regulations	25 kg or 25 L
14	waste containing dioxin as defined in section 1 of the Hazardous Waste Regulation	1 kg or 1 L, or less if the waste poses a danger to public safety or the environment
15	leachable toxic waste as defined in section 1 of the Hazardous Waste Regulation	25 kg or 25 L
16	waste containing polycyclic aromatic hydrocarbon as defined in section 1 of the Hazardous Waste Regulation	5 kg or 5 L
17	waste asbestos as defined in section 1 of the Hazardous Waste Regulation	50 kg
18	waste oil as defined in section 1 of the Hazardous Waste Regulation	100 L
19	waste that contains a pest control product as defined in section 1 of the Hazardous Waste Regulation	5 kg or 5 L
20	PCB wastes as defined in section 1 of the Hazardous Waste Regulation	25 kg or 25 L
21	waste containing tetrachloroethylene as defined in section 1 of the Hazardous Waste Regulation	50 kg or 50 L
22	biomedical waste as defined in section 1 of the Hazardous Waste Regulation	1 kg or 1 L, or less if the waste poses a danger to public safety or the environment
23	a hazardous waste as defined in section 1 of the Hazardous Waste Regulation and not covered under items 1 to 22	25 kg or 25 L
24	a substance, not covered by items 1 to 23, that can cause pollution	200 kg or 200 L
25	natural gas	10 kg

4.12 Air Quality and Dust Control

The Contractor will implement the following to minimize noise and air emissions during construction of the Project:

- Equipment and vehicles will be turned off when not in use, except for under the following circumstances:
 - When the vehicle/equipment is forced to remain motionless because of other traffic conditions or mechanical difficulties over which the operator has no control.
 - To bring the vehicle/equipment to the manufacturer's recommended operating temperature.
 - When it is necessary to operate auxiliary equipment that is in or on the vehicle/equipment to accomplish the intended use of the vehicle/equipment (e.g., cranes).
 - When the vehicle is detaching or exchanging a trailer.
 - When the vehicle/equipment is being repaired or engaged in repairing another vehicle, if idling is necessary for such repair.

- When the vehicle/equipment is queued for inspection, if idling is necessary for such inspection.
- For designated emergency vehicles or any vehicle/ equipment assisting in police, fire or ambulance services.
- When defrosting or defogging windows. Idling shall end when fog, frost, or ice conditions have been eliminated.
- Machinery covers and equipment panels will be well fitted and remain in place to muffle noise.
- All equipment and vehicles shall be well-maintained and used at optimal loads, with maintenance and daily logs completed following inspections to ensure they are in good working order.
- If necessary, dust-generating activities (e.g., demolition) will be managed during dry periods and periods of high wind.

5.0 CLOSURE

We sincerely appreciate the opportunity to have assisted you with this project. If there are any questions, please do not hesitate to contact the undersigned by phone at 587.580.8095.

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APPENDIX A

Archaeological Chance Find Procedure

Archaeological Chance Find Procedure: Turning Dolphin Removal Bella Coola Small Craft Harbour, Bella Coola, BC

Prepared for:

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LIST OF ACRONYMS AND ABBREVIATIONS

Acronym / Abbreviation	Definition
AD	Anno Domini
CMT	Culturally Modified Tree
HCA	Heritage Conservation Act
m	Metre

1.0 INTRODUCTION

The purpose of this Archaeological Chance Find Procedure is to address the possibility of archaeological deposits becoming exposed during ground altering activities within the Project area during site preparation or construction. This document provides protocols to follow if archaeological materials are inadvertently discovered, particularly appropriate protection and documentation.

Archaeological resources are non-renewable, susceptible to disturbance, and finite in number. Archaeological sites are a valuable resource that are protected for their historical, cultural, scientific and educational value to the general public, local communities, and Indigenous groups. The regulatory context for archaeological resources is outlined in **Section 7.0**.

Potential disturbance to archaeological resources must be avoided or managed by Small Craft Harbours (SCH), partners, agents, and contractors undertaking Project sponsored developments. The objectives of this Archaeological Chance Find Procedure are to promote preservation of archaeological data while minimizing disruption of construction scheduling. All on-site personnel and contractors who may interact with soil or sediment within the Project area will be informed of the Archaeological Chance Find Procedure and have access to a copy while on site.

Developments that involve excavation, movement, or disturbance of soils have the potential to impact archaeological materials, if present. Activities such as road construction, land clearing, and excavation are all examples of activities that may adversely affect archaeological deposits. Even areas with previous development history, such as areas where fill has been placed during past development activities, may have intact archaeological deposits in native soil underlying the fill. Imported fill itself may contain disturbed and transported archaeological remains. This Archaeological Chance Find Procedure is intended to be used in conjunction with the Project's Construction Environmental Management Plan.

Additional contact information for appropriate designated individuals is provided in **Appendix 1**. A record of contact form is included in **Appendix 2** and the Chance Find Report Form is included as **Appendix 3**.

2.0 INDIGENOUS CULTURAL HERITAGE

Indigenous cultural heritage is deeply connected to, but also extends beyond the tangible objects classified as 'archaeological' resources. Archaeological resources are culturally meaningful and connect community members to the past and represent a collective identity. These resources represent ways of knowing and generational knowledge passed on through the generations. Every Indigenous group manages their cultural heritage in a unique way, but always with respect for the past and future generations.

3.0 CHANCE FIND GUIDANCE AND PROCEDURE

Proper implementation of an Archaeological Chance Find Procedure may lead to discovery of archaeological and/or cultural heritage resources that were not identified in previous archaeological site investigations. As such, it is a valuable tool when properly implemented.

For the Archaeological Chance Find Procedure to be effectively implemented during construction, the Contractor Site Supervisor must ensure that all relevant on-site personnel understand the procedure and the importance of following it if archaeological and cultural heritage resources are encountered.

If suspected archaeological and/or cultural materials and/or features (both intact and disturbed) are encountered, follow these steps:

1. **Stop all potentially damaging work within 50 m** of the suspected archaeological or cultural heritage materials and secure the area.
2. **Report** the discovery immediately to the following:
 - SCH Project Manager (PM); Jonathan Appleton, (604) 351-7604
 - Contractor Site Supervisor; **TBD**
 - Environmental Monitor (EM); **TBD**.

The SCH PM, Site Supervisor, or EM will contact other entities as required. However, if personnel are not available, please contact:

- **BC Archaeology Branch Reception:** (250) 953-3334.
3. **Do not disturb** any suspected archaeological materials that are encountered. Do not move any soil from the vicinity of the site, including any spoil material.
 4. **Record** where the find is located, either by flagging the site, by GPS or other location marking device and leave all materials in place.
 5. SCH will contact an archaeologist who will visit the site as soon as possible and determine (in consultation with the BC Archaeology Branch and Indigenous communities):
 - The potential significance of the materials; and,
 - Required mitigation.
 6. If the significance of the archaeological materials is judged to be sufficient to warrant further action and the archaeological materials cannot be avoided, then the archaeologist will consult with appropriate government representatives and representatives of local Indigenous communities to determine the appropriate course of action.

4.0 PROCEDURE FOR REPORTING ANCESTRAL / HUMAN REMAINS (NOT OF FORENSIC CONCERN)

Ancestral/human remains are found in many contexts and may be scattered due to previous disturbances or found fully intact and associated with a mortuary context, such as burial mounds or in other contexts, such as in middens.

Ancestral/human remains are to be treated with the utmost respect no matter the state or context of the remains. ***If ancestral/human remains are encountered and suspected to be of forensic concern, immediately contact the local police department or phone 911.***

If you discover what you suspect may be possible ancestral/human remains (intact or disturbed):

1. **Stop all potentially damaging work within 50 m** of the site of potential ancestral/human/ancestral remains until they can be assessed by a professional archaeologist.
2. **Do not disturb** any possible ancestral/human remains that are encountered. Do not move soil from the vicinity of the remains, including adjacent spoil material. Cover the remains with a clean blanket and tarp, or something similar and limit access to the area.
3. **Report** the discovery immediately to the following:
 - SCH Ferries PM; Jonathan Appleton, (604) 351-7604
 - Contractor Site Supervisor; **TBD**
 - EM; **TBD**.
4. SCH will contact an archaeologist, who will advise on further action. If the above contacts are unreachable for direction, contact:
 - **RCMP Non-emergency line:** (250) 799-5363.

Archaeologist Actions: The archaeologist will immediately notify relevant Indigenous communities, and if appropriate, the local policing authority and the BC Coroners Service.

- An archaeologist or a representative who has specialized training in physical anthropology and representatives from all available local Indigenous communities will visit the site as soon as possible.
- If it is determined that the ancestral/human remains are archaeological in nature, discussions will take place to establish an appropriate procedure for handling of the remains.
- The BC Archaeology Branch will be notified of the archaeological find and the archaeologist will work with the Branch to determine permitting requirements.
- If it is determined that the ancestral/human remains are not archaeological in nature, the local policing authority and BC Coroners Service will provide further guidance (FLNRORD 2021a).

Management Options: An appropriate protocol for handling ancestral/human remains requires consultation with Indigenous communities, many of whom have their own existing policies for taking care of ancestral/human remains. Any management options for found human remains will encompass Indigenous requirements as well as the Archaeology Branch's Found Human Remains Policy. Please note that removal of ancestral/human remains and subsequent reburial may involve certain ceremonies or procedures that could delay Project activities.

5.0 ARCHAEOLOGICAL AND CULTURAL HERITAGE RESOURCES IN BC

More than 55,000 archaeological sites are currently recorded in BC with many more being added to the provincial inventory every year. For this reason, you will likely encounter an archaeological site during your lifetime - either knowingly or unknowingly. This Archaeological Chance Find Procedure has been established to increase awareness of this important resource and to assist in planning future developments.

Shorelines and adjacent areas have been utilised by Indigenous groups for thousands of years. The remnants of this occupation are represented in today's landscape by a wide variety of site types, most of which are related to village or camping sites, resource gathering and production (such as fishing and hunting), tool making, and traditional ceremonial or ritual activities. Some sites that may be immediately visible to a non-archaeologist include shell and non-shell middens.

- Shell middens, both intact and disturbed, are cultural accumulations of shells, stratified in white and grey layers, mixed with streaks of charcoal, ash, and other debris. Shell middens were also commonly used as human burial sites. Look for accumulations of layered, crushed, and whole shell possibly mixed with charcoal, black soil, and other food remains (i.e., fish bone)
- Non-shell midden, as above, cultural accumulations soil deposits, stratified in white and grey layers, mixed with streaks of charcoal, ash, and other debris, such as animal bone, charcoal, black soil, and other food remains (i.e., fish bone)



Photo Source: <http://www.akarenga-h.jp/en/archives/library/468/>

Photo 1 Shell Midden



Photo Source: <http://www.sliammonfirstnation.com/archaeology/fishing.html>

Photo 2 Salmon and Herring Bone

- Surface features such as cultural mounds, or depressions created by former habitations, earthen fortifications, rock cairns/petroforms (can be easily mistaken as rock piles) and hearths. Look for formations distinct from the landscape and unnaturally occurring rock formations.



Photo Source: <https://qmackie.com/2014/03/11/two-talks-in-victoria-next-seven-days/>

Photo 3 Burial (rock) Cairn



Photo Source: <http://janfast.blogspot.com/2017/05/newly-found-stone-age-hearths-from.html>

Photo 4 **Hearth (firepit) feature with fire-cracked rock**

- Clam gardens, look for piles of boulders at the edges of beach areas, or rock walls and terraces

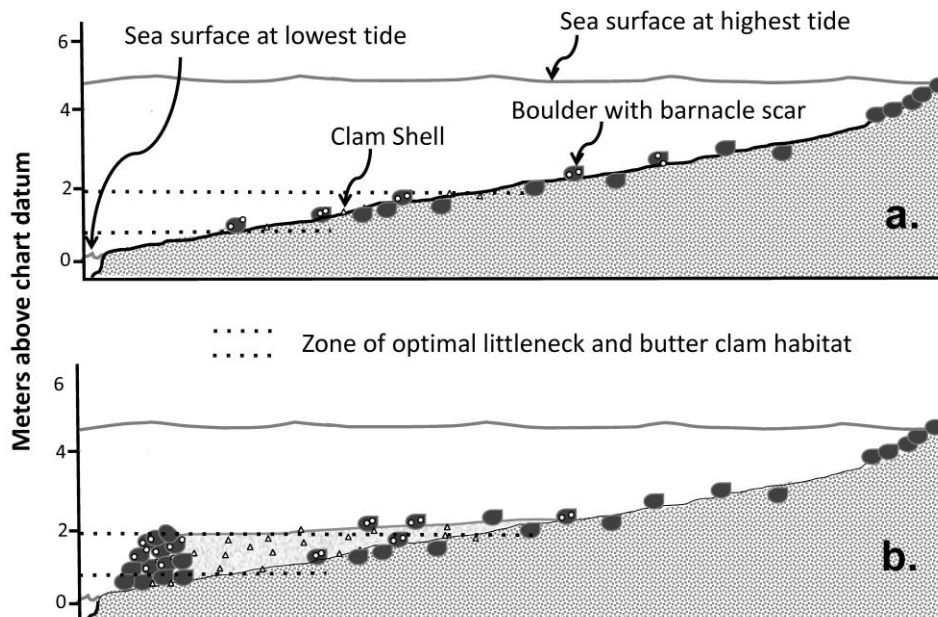


Photo Source: <https://clamgarden.com/clamgardens/constructing-clam-gardens/>

Photo 5 **Clam garden diagram**



Photo Source: <https://www.pc.gc.ca/en/pn-np/bc/gulf/nature/restoration-restoration/parcs-a-myes-clam-gardens>

Photo 6 Clam garden rock walls

- Fish traps and weirs. Fish weirs and traps are typically comprised of linear arrangements of wooden stakes interwoven with brush or mats to trap fish on the falling tide. Look for short stubs of small diameter branches in linear arrangements in the inter-tidal zone or along the river bank.



Photo Source: <https://ecologicalprocesses.springeropen.com/articles/10.1186/2192-1709-2-12>

Photo 7 Intertidal Fish Trap



Photo Source: <https://ecologicalprocesses.springeropen.com/articles/10.1186/2192-1709-2-12>

Photo 8 Intertidal Fish Weir

- Tree Art and Culturally Modified Trees (CMT). Involves modification to the tree, commonly the removal of the inner and outer bark. Evident from scarring of the bark.



Photo Source: Personal photo, Golden Ears Park, BC – E. Powell

Photo 9 Tree Art and Culturally Modified Trees (CMT)



Photo Source: <http://blog.hellobc.com/rv-road-trip-bella-coola/>

Photo 10 Tree Art and Culturally Modified Trees (CMT)

- Artifacts that have become visible on the land surface owing to erosion or recent land altering activity. These may be produced in a variety of materials such as stone, bone, antler, wood, or shell. Look for obviously formed stone objects or pieces of stone that have been chipped and/or ground in a non-natural way. Bone and antler artifacts will exhibit obvious modification (i.e., cutting, shaping, incision, etc.).



Photo Source: <https://archaeologyblog.treetimeservices.ca/tag/lithics/page/2/>

Photo 11 Chipped Stone Tools



Photo Source: <http://twipa.blogspot.com/2011/04/f-is-for-forts-feature-flint-fridayand.html>

Photo 12 Fire cracked rock – note sharp, angled breaks



Photo Source: <http://www.arrowheadology.com/forums/arrowheads-and-indian-artifacts/29293-need-some-help-deer-bone-antler-tools-photos-needed-2.html>

Photo 13 Deer bone and antler tools



Photo Source: <http://www.adsny.com/nyindian/roughstonearticles.html>

Photo 14 Hand Mauls (Hammer Stones)



Photo Source: <https://oregonhistoryproject.org/articles/historical-records/sinker-stone-columbia-river/#.WVKgbOmQyUk>

Photo 15 Fish Net Sinker Stone

- Waterlogged deposits or wet sites, which are locations containing organic artifacts (i.e., wood, bark, or plant fibre), that are preserved due to their presence in an anaerobic (oxygen free) environment. Look for fragmentary baskets, rope, carved wood implements (e.g., wedges), and similar objects eroding from intertidal silts and/or clay deposits.



Photo Source: <https://ecologicalprocesses.springeropen.com/articles/10.1186/2192-1709-2-12>

Photo 16 Gill net made of spruce



Photo Source: <http://newswarp.info/2013/01/kilgii-gwaay%E2%80%9410700-year-old-wet-site-revisited-on-the-southern-haida-gwaii-b-c-canada/>

Photo 17 Preserved wood and stone tool

- Rock Art - Includes pictographs (paintings) and petroglyphs (carvings), often found on rock faces, not always in obvious locations – may be obscured by vegetation or rock overhangs.

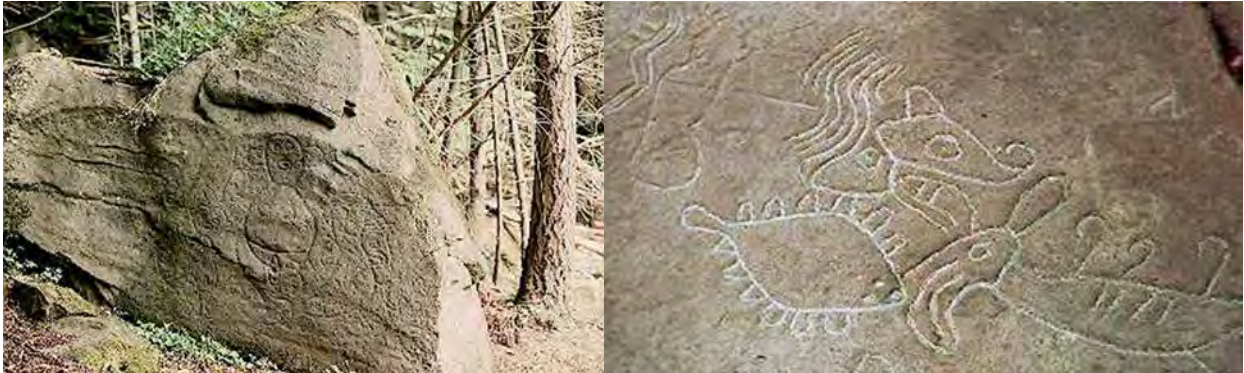


Photo Source: <http://www.sfu.ca/archaeology-old/museum/rockart/index.html>

Photo 18 Petroglyphs



Photo Source: <http://interiorpicto.com/wp-content/uploads/2013/10/pierre-john11.png>

Photo 19 Pictograph

6.0 REPORTING

The individual reporting the Chance Find must fill out the Archaeological Chance Find Procedure Record of Contact found in **Appendix 2**. The archaeologist will complete the Archaeological Chance Find Report Form, **Appendix 3**, and inform the client of potentially required Provincial Archaeological permits (i.e., Indigenous, Site Alteration Permit, etc.). The required permits will identify appropriate mitigation and protection measures, including potential further assessment. The archaeologist will also inform the client of when work may resume in the cordoned off area of the site.

7.0 LEGISLATION

In BC, the *Heritage Conservation Act*, (HCA) automatically protects all archaeological sites that predate AD 1846 on Provincial Crown or private land, whether they are known or not, and must not be altered without a permit. Burial sites and rock art sites are protected regardless of age (BCAPA 2012, FLNRORD 2021b).

In Canada, archaeological materials or sites on federal lands and lands underwater are within the jurisdiction of the Parks Canada Agency (S.4(1) B) and the *Parks Canada Agency Act*, SC 1998, c. 31. Guidelines provided by the federal government pertaining to archaeological materials or sites include Parks Canada Guidelines for the Management of Archaeological Resources (2005), and Canada Research and Collection Permit Process (2017) as well as the Treasury Board's Guide to the Management of Moveable Heritage Assets (2008). While provincial laws do not apply to federal lands, "Parks Canada refers to certain aspects for guidance as a matter of practicality" (Parks Canada 2005), and generally accepts as best practice the archaeological standards established by the BC Archaeology Branch. These include the Archaeological Impact Assessment Guidelines (FLNRORD 2021b).

8.0 REFERENCES

British Columbia Association of Professional Archaeologists (BCAPA). 2012. Standard of Practice: Defining Site Boundaries in the Field.

FLNRORD. 2021a. Procedures for Reporting Human Remains - Archaeology - Ministry of Forests, Lands, Natural Resource Operations and Rural Development. Government of British Columbia - Archaeology. Provincial Government. < <https://www2.gov.bc.ca/gov/content/industry/natural-resource-use/archaeology/bulletins-policies> >.

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Government of British Columbia. 1996. *Heritage Conservation Act*. <http://www.bclaws.ca/civix/document/id/complete/statreg/96187_01>.

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Treasury Board of Canada Secretariat. 2008. Guide to the Management of Movable Heritage Assets. <<http://www.tbs-sct.gc.ca/pol/doc-eng.aspx?id=13872>>.

APPENDIX 1

Contact Names and Telephone Numbers

Agency	Name of Contact	Phone Number
SCH Project Manager	Jonathan Appleton	604.351.7604
Site Supervisor (Contractor)	TBD	TBD
Environmental Monitor	TBD	TBD
Archaeologist	TBD	TBD
BC Archaeology Branch	Reception	250.953.3334
RCMP (Non-emergency)	Local Detachment – Bella Coola	250.799.5363
BC Coroners Service	Northern Region	250.861.7429 or toll free 1.888.991.2111
Indigenous Contacts	Nuxalk Nation Band Office	250-799-5613

APPENDIX 2

Record of Contact

APPENDIX 3

Chance Find Report Form

Appendix 3: CHANCE FIND REPORT FORM

Recorder's Name/Affiliation: _____

Date: _____

Location of chance find (Location description, UTM coordinates, road, quarter section, depth below surface):

Photographs Taken (#s) (please include name/number or owner of camera):

Description of find:

Method used to mark and protect find:

Distribution:

<input type="checkbox"/> Contractor or Site Supervisor	<input type="checkbox"/> Project Archaeologist	<input type="checkbox"/> BC Archaeology Branch	<input type="checkbox"/> R.C.M.P.	<input type="checkbox"/> Local Indigenous Communities
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Sketch Map



ADDITIONAL NOTES:

APPENDIX B

Fuel and Hazardous Material Spill Response Plan

FUEL AND HAZARDOUS MATERIAL SPILL RESPONSE PLAN

Prior to the commencement of any construction activities, determine the appropriate clean-up and contingency plans in the event of a fuel or hazardous material spill. Contractors will be required to have on hand, project specific amounts of spill response materials (e.g., absorbent materials, PPE, hand tools, plastic sheeting, etc.) and personnel will be trained in emergency situations. If a spill of harmful substances occurs at the Site, implement the following steps.

1. Ensure Safety

- a. Ensure personal, public and environmental safety.
- b. Determine product spilled before acting and wear appropriate PPE.
- c. Notify people in the immediate vicinity.
- d. Ensure there are no ignition sources if the product is flammable.

2. Stop the Flow

- a. If safe to do so, stop flow at the source as quickly as possible (i.e., close valves, shut off pumps).

3. Secure the Area

- a. Limit access to the spill area through use of flagging or fencing, as needed.
- b. Prevent unauthorized entry to site.

4. Contain the Spill

- a. Prevent spilled material from entering waterbodies, ditches, drainage structures (e.g., culverts, drains).
- b. Use spill sorbent material to contain the spill.
- c. Use sorbent booms to contain and recover contaminants from waterbodies.
- d. Create berms or use other methods to prevent flow of spilled material off site.
- e. Contain spill as close to the source as possible.

5. Notify and Report

- a. Notify the EM, who will in turn notify all required parties.
- b. See Table in **Section 4.11** for reporting requirements and under the guidance of the EM, contact the Provincial Emergency Program's spill reporting hotline at **1-800-663-3456**.
- c. Prepare an environmental incident report (see **Section 1.3**).