



**PORT of
vancouver**

Vancouver Fraser
Port Authority

**VANCOUVER FRASER PORT AUTHORITY
PROJECT AND ENVIRONMENTAL REVIEW
REPORT AND PERMIT**

PER No.:	22-045
Tenant:	Delta Cedar Products Ltd.
Project:	Delta Cedar Maintenance Dredging
Project Location:	10075 River Road, Delta, British Columbia
Vancouver Fraser Port Authority SID No.:	DEL322
Land Use Designation:	Industrial
Applicant/Permit Holder:	Fraser River Pile & Dredge (GP) Inc. (FRPD)
Category of Review:	B
Date of Approval:	July 6, 2022
Date of Expiry:	February 28, 2027

1 INTRODUCTION

The Vancouver Fraser Port Authority (the “Port Authority”), a federal Port Authority, manages lands under the purview of the *Canada Marine Act*, which imparts responsibilities for environmental protection. The Port Authority accordingly conducts project and environmental reviews of works and activities undertaken on these lands to ensure that the works and activities will not likely cause significant adverse environmental effects. This project and environmental review report and project permit (the “Permit”) documents the Port Authority’s project and environmental review of PER No. 22-045: Delta Cedar Maintenance Dredging (the “Project”) proposed by Fraser River Pile & Dredge (GP) Inc. (FRPD) working on behalf of Delta Cedar Products Ltd. (the “Applicant”).

This project and environmental review was carried out to address the Port Authority’s responsibilities under the *Canada Marine Act*, and to meet the requirements of the *Impact Assessment Act*, as applicable. The proposed Project is not considered a “designated project” under the *Impact Assessment Act* and an impact assessment as described in the *Impact Assessment Act* is not required. However, Port Authority authorization is required for the proposed Project to proceed and in such circumstances, where applicable, Section 82 of the *Impact Assessment Act* requires federal authorities to assure themselves that projects will not likely cause significant adverse environmental effects. This review provides that assurance. In addition, the Port Authority considers other interests, impacts and mitigations through the project and environmental review.

The project and environmental review considered the application along with supporting studies, assessments and consultations carried out or commissioned by the Applicant, as well as other information provided by the Applicant. In addition, this project and environmental review considered other information available to the Port Authority and other consultation carried out by the Port Authority. A full list of information sources germane to the review is provided in the following pages of this report.

This Permit is the authorizing document allowing the Applicant to proceed with the Project subject to the listed project and environmental conditions.

2 PROJECT DESCRIPTION

The Applicant proposes to conduct periodic maintenance dredging of up to 12,000 cubic metres per year within the water lot adjacent to 10075 River Road, Delta, BC (Figure 1). Maintenance dredging is required to remove accumulated sediments from within the water lot to restore design grades and ensure continued safe navigation and operation of dozer boats, barges, and support vessels. Similar maintenance dredging was most recently conducted in February 2022 under Permit 18-050.

In this Permit, the Project means the physical activities authorized by the Port Authority to be carried out pursuant to **PER No. 22-045**, as described below.

- Maintenance dredging to be conducted from water using a marine spud derrick- or barge-mounted clamshell dredge. The derrick will maintain position via spuds that are driven into the riverbed while the barge will be secured in place using existing piles. The derrick or barge will be towed to the site on the Fraser River using a tugboat
- The dredge footprint is approximately 10,400 square metres. During each dredge event high points will selectively be dredged (i.e., the entire footprint is not dredged each event) with a general target dredge grade range between -3 and -5 metres chart datum. This scope of work is consistent with previous maintenance dredging works for the site
- Dredged materials will be loaded onto barges for transport and disposal at an approved disposal at sea site under a valid disposal at sea permit from Environment and Climate Change Canada. Sediment quality testing was most recently completed in February 2019
- Dredging is anticipated to be conducted several times per year on weekend shutdowns and potentially holidays to accommodate the sawmill schedule



Figure 1 Proposed dredge footprint (orange outline)

3 VANCOUVER FRASER PORT AUTHORITY INTERNAL REVIEWS

The following Port Authority departments have undertaken and completed a review of these works and confirm that the proposal meets their requirements, subject to the listed project and environmental conditions.

Planning

Environmental Programs

Project Consultation

Marine Operations

4 INDIGENOUS CONSULTATION

The Port Authority has reviewed the proposed works and determined that adverse impacts to Aboriginal or Treaty rights are not expected.

5 EXISTING POLICIES OR GUIDELINES

The Project area is designated as “Industrial” in the Port Authority Land Use Plan. The Project does not represent a change in use of the site; it supports the primary use under this designation, and is, therefore, consistent with the Land Use Plan.

6 NOTIFICATIONS

6.1 Municipal Notification

The proposed Project was assessed by the Port Authority to have potential impacts to municipal interests. A notification letter was sent to the City of Delta on May 3, 2022, notifying them of the proposed Project. The City of Delta had no comments.

6.2 Federal, Provincial, Regional Agency Consultation

The proposed Project was assessed by the Port Authority to be of potential interest to other regulatory agencies. A referral letter was sent to Metro Vancouver on May 4, 2022 notifying them of the proposed Project as a stakeholder, given they own/operate and have a licence over the South Surrey Interceptor (SSI) sanitary line near to the proposed dredging area.

Metro Vancouver had a number of comments, given the proximity of the proposed dredging to the SSI, and in particular requested more details on the proposed dredging plan. In response to this request the Applicant revised their dredging plan to scale back the dredging footprint, to operate no less than 30 metres from the SSI, to reduce any potential risk the dredging and activities might have on the line. In a second round of comments, Metro Vancouver again requested to see further information on the Applicant’s dredging plan. In response, the Port Authority advised Metro Vancouver that a condition would be included in a permit issued, that the Applicant not be allowed to dredge, or permit barges or other vessels to anchor or spud, within 30 metres of the mapped SSI, unless otherwise approved in writing by Metro Vancouver and the Port Authority.

Given the revisions to the proposed dredging, any potential adverse effects from the works on the SSI are expected to be mitigated.

6.3 Public Engagement

To meet requirements of section 86 of the *Impact Assessment Act*, the Port Authority posted a description of the Project and notice of public participation to the Canadian Impact Assessment Registry to provide the public 30 calendar days to comment on the Project and provide community knowledge.

The comment period ran from April 19 to May 18, 2022. At the close of the 30-calendar day public comment period, no comments were received.

The proposed Project was assessed by the Port Authority to have minimal or no potential impacts to community interests in the surrounding area either during construction or once the Project is completed. Therefore, no construction notification was required.

7 INFORMATION SOURCES

The Port Authority has relied upon the following sources of information in its review of the Project.

- Application form and materials submitted by the Applicant on April 4, 2022
- Project correspondence from April 11, 2022 to July 5, 2022
- Report titled Delta Cedar Products Ltd. – DELTA SAWMILL 10075 RIVER ROAD, DELTA, BC Project and Environmental Review Application – Maintenance Dredging
- Drawing labelled PER No.22-045 A – Delta Cedar VFPA Dredge Area Rev2 (2022-06-01)
- Plan titled VFPA Project Permit PER 22-045 – Marine Construction and Staging Plan Revision 1
- Analytical data titled Certificate of Analysis (L2236519) Delta Cedar – 19008 CO#3 – March 7, 2019

8 PROJECT AND ENVIRONMENTAL REVIEW DECISION

In completing the project and environmental review, the Port Authority has reviewed and taken into account relevant information available on the proposed project and has considered any adverse impact that the Project may have on the rights of Indigenous peoples, Indigenous knowledge, community knowledge, comments received from the public, and measures that would mitigate any significant adverse environmental effects of the Project. We conclude that with the implementation of proposed mitigation measures and conditions described in the project and environmental conditions section below, the Project is not likely to cause significant adverse environmental effects.

In completing the project and environmental review, the Port Authority concludes that with the implementation of proposed mitigation measures and conditions described in the project and environmental conditions section below, the Project has appropriately addressed all identified concerns. Project Permit PER No. 22-045 is approved by:

ORIGINAL COPY SIGNED

CHRIS BISHOP
MANAGER, PROJECT AND ENVIRONMENTAL
REVIEW

July 6, 2022

DATE OF APPROVAL

9 PROJECT AND ENVIRONMENTAL CONDITIONS

The Port Authority has undertaken and completed a review of the Project in accordance with the *Canada Marine Act* and Section 5 of the Port Authorities Operations Regulations and, as applicable, Section 82 of the *Impact Assessment Act*.

If at any time Fraser River Pile & Dredge (GP) Inc. (FRPD) working on behalf of Delta Cedar Products Ltd. (the “Permit Holder”) fails to comply with any of the project and environmental conditions set out in the project permit (the “Permit”) below, or if the Port Authority determines that the Permit Holder has provided any incomplete, incorrect or misleading information in relation to the Project, the Port Authority may, in its sole and absolute

discretion, cancel its authorization for the Project or change the project and environmental conditions to which such authorization is subject.

Pursuant to Section 29 of the *Port Authorities Operations Regulations*, the Port Authority may also cancel its authorization for the Project, or change the project and environmental conditions to which such authorization is subject, if new information is made available to the Port Authority at any time in relation to the potential adverse environmental and other effects of the Project.

The following are the minimum conditions that must be followed by the Permit Holder to mitigate potential or foreseeable adverse environmental and other effects.

Port Authority Guidelines and Record Drawing Standards referenced in this document can be located at: <https://www.portvancouver.com/permitting-and-reviews/per/project-and-environment-review-applicant/guidelines/>.

No.	GENERAL CONDITIONS
1.	The Permit Holder must have a valid lease, licence, or access agreement for the Project site prior to accessing the Project site or commencing construction or any other physical activities on the Project site. This Permit shall in no way limit any of the Permit Holder's obligations, or the Port Authority's rights, under such lease, licence, or access agreement.
2.	The Permit Holder shall at all times and in all respects, comply with and abide by all applicable statutes, laws, regulations and orders from time to time in force and effect, including all applicable environmental, labour and safety laws and regulations.
3.	This Permit in no way endorses or warrants the design, engineering, or construction of the Project and no person may rely upon this Permit for any purpose other than the fact that the Port Authority has permitted the construction of the Project, in accordance with the terms and conditions of this Permit.
4.	The Permit Holder shall indemnify and save harmless the Port Authority in respect of all claims, losses, costs, fines, penalties or other liabilities, including legal fees, arising out of: (a) any bodily injury or death, property damage or any loss or damage arising out of or in any way connected with the Project; and (b) any breach by the Permit Holder of its obligations under this Permit.
5.	The Permit Holder shall undertake and deliver the Project to total completion in a professional, timely and diligent manner in accordance with applicable standards and specifications set out in the sections above entitled Project Description and Information Sources. The Permit Holder shall not carry out any other physical activities unless expressly authorized by the Port Authority.
6.	The Permit Holder shall cooperate fully with the Port Authority in respect of any review by the Port Authority of the Permit Holder's compliance with this Permit, including providing information and documentation in a timely manner, as required by the Port Authority. The Permit Holder is solely responsible for demonstrating the Permit Holder's compliance with this Permit.
7.	The Permit Holder shall review the Permit with all employees, agents, contractors, licensees and invitees working on the Project site, prior to such parties participating in any construction or other physical activities on the Project site. The Permit Holder shall be solely responsible for ensuring that all such employees, agents, contractors, licensees and invitees comply with this Permit.
8.	The Permit Holder shall make available upon request by any regulatory authority (such as a Fishery Officer) a copy of this Permit.
9.	Unless otherwise specified, the Permit Holder shall provide plans, documents, and notices required under this Permit to the following email address: per@portvancouver.com and referencing PER No. 22-045 .

10.	The Port Authority shall have unfettered access to environmental compliance documentation and the Project site at all times during construction without notice.	
11.	The Permit Holder must maintain and retain any records associated with, or produced by, actions or activities undertaken to achieve compliance or that indicate non-compliance with project permit conditions. These records must be made available at the request of the Port Authority.	
	CONDITIONS – PRIOR TO COMMENCING CONSTRUCTION OR ANY PHYSICAL ACTIVITIES	SUBMISSION TIMING (business days)
12.	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.	Before commencing construction or any physical activities
13.	At least two days prior to commencing any physical activities, the Permit Holder shall notify the Harbour Master and Project and Environmental Review, email: Harbour_Master@portvancouver.com and PER@portvancouver.com .	At least two days prior to commencing each dredging event
14.	Prior to the commencement of any vessel-related activities, the Permit Holder shall contact Canadian Coast Guard (CCG) Marine Communications and Traffic Services (MCTS), (email: NAVWARN.MCTSPRinceRupert@innav.gc.ca ; Phone: 250-627-3070) regarding the issuance of a Navigational Warning (NAVWARN) to advise the marine community of potential hazards associated with the Project. The Port Authority's Marine Operations department shall be copied on the request (navigation.review@portvancouver.com).	As per Coast Guard requirements
	CONDITIONS – DURING CONSTRUCTION OR ANY PHYSICAL ACTIVITIES	
15.	Physical activities related to the Project may proceed up to 7 days a week, 24 hours a day.	
16.	The Permit Holder shall notify the Port Authority within two business days of any complaints received from the community and stakeholders during construction and indicate how the Permit Holder has responded to such complaints.	
17.	The Permit Holder shall not dredge or permit barges or other vessels to anchor or spud within 30 metres of the mapped Metro Vancouver (GVS&DD) South Surrey Interceptor sanitary line, unless otherwise approved in writing by Metro Vancouver and the Port Authority.	
18.	Without limiting the generality of permit condition #2, 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 of the <i>Fisheries Act</i> ; or (b) adversely affect fish or fish habitat in a manner contrary to Section 35 of the <i>Fisheries Act</i> .	
19.	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.	

20.	<p>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:</p> <ul style="list-style-type: none"> 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; and b) when background is greater than 50 NTU, induced turbidity shall not exceed the background values by more than 10% of the background value. <p>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.</p>
21.	<p>Without limiting the generality of permit condition #2, the Permit Holder shall dredge/load all material intended for disposal at sea under a valid Disposal at Sea Permit pursuant to the provisions of Part 7, Division 3 of the <i>Canadian Environmental Protection Act, 1999</i>.</p>
22.	<p>Without limiting the generality of permit condition #2, 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.</p>
23.	<p>To reduce potential impacts to white sturgeon and other fish species, dredging is only permitted to occur between June 15 and July 15, and between October 1 and February 28, inclusive, unless otherwise approved in writing by Fisheries and Oceans Canada (DFO) or the Port Authority. The Port Authority shall be notified of any DFO exemptions allowing works outside this period.</p>
24.	<p>The Permit Holder shall use an environmentally clean clamshell bucket. The bucket and any portion of the cables 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.</p>
25.	<p>The Permit Holder shall not permit barges or other vessels used during the Project to ground on the foreshore or riverbed or otherwise disturb the foreshore or riverbed (including disturbance as a result of vessel propeller wash), excepting only such disturbance as is reasonably required resulting from the use of barge spuds.</p>
26.	<p>The Permit Holder shall not disturb the riverbed outside the Project site.</p>
27.	<p>The Permit Holder shall maintain equipment in good mechanical condition and free of fluid leaks, invasive species, and noxious weeds.</p>
28.	<p>If a slow bell has been requested, the Permit Holder shall cancel the slow bell when it is no longer needed (after hours, or upon completion of vessel related activities).</p>
29.	<p>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.</p>

30.	During any vessel-related activities, the Permit Holder shall: <ul style="list-style-type: none"> a) Position vessels and equipment associated with the Project in such a manner so as not to obstruct line of sight to navigational aids or markers b) Exhibit the appropriate lights and day shapes at all times c) Monitor the VHF channel used for MCTS communications in the respective area at all times and participate as necessary d) Be familiar with vessel movements in areas affected by the Project e) Plan and execute the Project in a manner that will not impede navigation or interfere with vessel operations f) During night hours, unless working 24 hours per day, ensure that the rig and associated equipment is moored outside the navigation channel and lit in accordance with all applicable regulations 	
CONDITIONS – UPON COMPLETION		SUBMISSION TIMING (Business Days)
31.	The Permit Holder shall notify the Port Authority upon completion of the Project.	Upon substantial completion
The Port Authority reserves the right to rescind or revise these conditions at any time that new information warranting this action is made available to the Port Authority.		
LENGTH OF PERMIT VALIDITY		
The Project must be completed no later than February 28, 2027 (the “Expiry Date”).		
AMENDMENTS		
<ul style="list-style-type: none"> • Details of any material proposed changes to the Project, including days and hours when construction and any physical activities will be conducted, must be submitted to the Port Authority for consideration of an amendment to this Permit. • For an extension to the Expiry Date, the Permit Holder must apply in writing to the Port Authority no later than 40 business days prior to that date. 		
Failure to apply for an extension as required may, at the sole discretion of the Port Authority, result in termination of this Permit.		

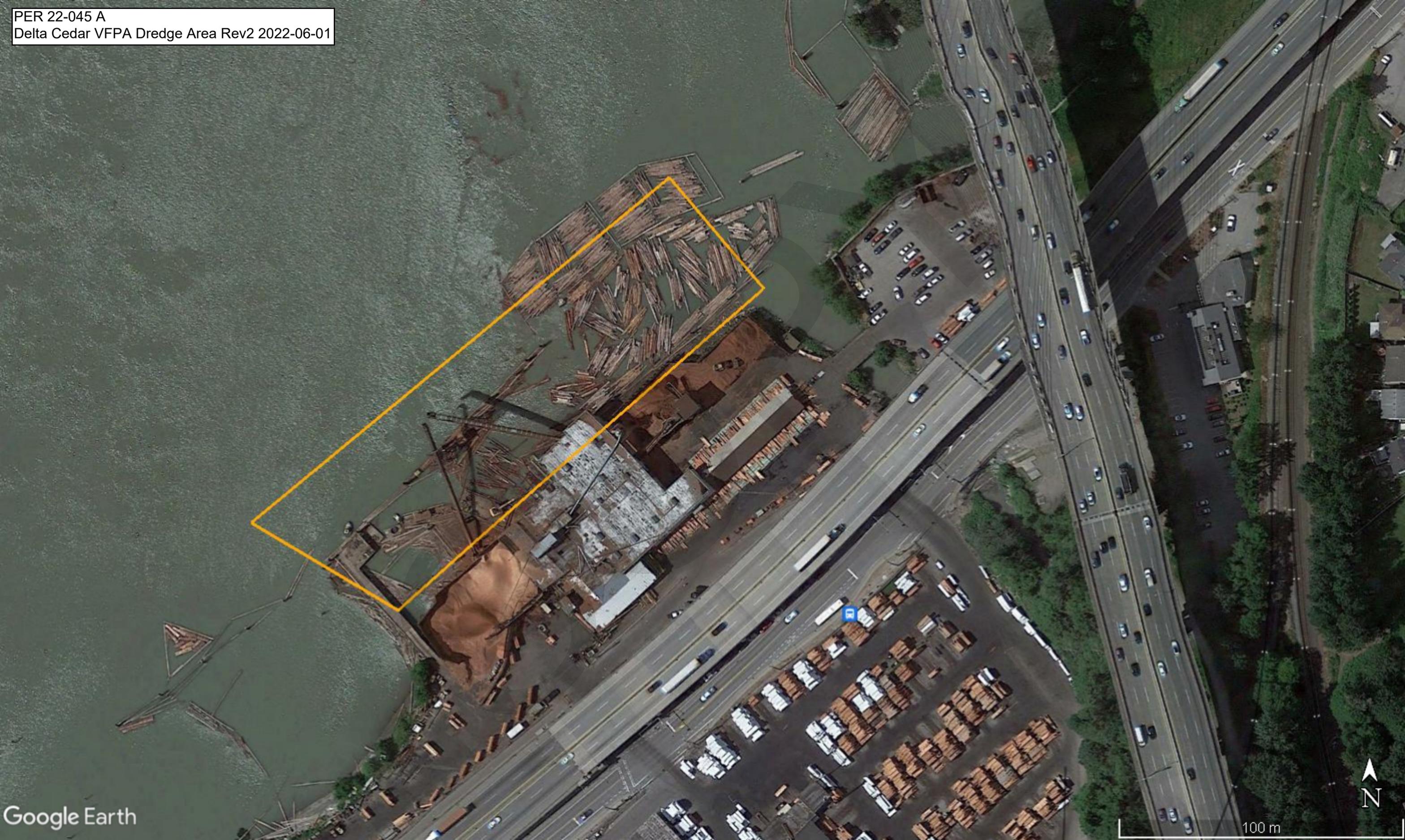
CONTACT INFORMATION

Vancouver Fraser Port Authority
 100 The Pointe, 999 Canada Place
 Vancouver BC V6C 3T4 Canada

Project and Environmental Review
 Tel.: 604-665-9047
 Fax: 1-866-284-4271
 Email: PER@portvancouver.com
 Website: www.portvancouver.com

After normal business hours:

In the event of any land or marine construction incidents or concerns related to works carried out on-site under this permit, please contact the 24/7 Port Operations Centre 604-665-9086. In the event of an emergency requiring ‘First Responders’, please call 911 first.





FRASER RIVER PILE & DREDGE LTD.
ATTN: Robert Cochrane
1830 River Drive
New Westminster BC V3M 2A8

Date Received: 25-FEB-19
Report Date: 07-MAR-19 18:35 (MT)
Version: FINAL REV. 3

Client Phone: 604-522-7971

Certificate of Analysis

Lab Work Order #: L2236519
Project P.O. #: NOT SUBMITTED
Job Reference: DELTA CEDAR - 19008 CO#3
C of C Numbers:
Legal Site Desc:

Comments: ADDITIONAL 06-MAR-19 18:07

7-MAR-2019 Revision 2: Includes additional sample, L2236519-8.

7-MAR-2019 Revision 3: This revision replaces and supersedes revision 2 of this report. The PAH data for the sample, L2236519-8, has been modified.

Can Dang
Senior Account Manager

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ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID	L2236519-1	L2236519-2	L2236519-3	L2236519-4	L2236519-5
		Description	Sediment	Sediment	Sediment	Sediment	Sediment
		Sampled Date	23-FEB-19	23-FEB-19	23-FEB-19	23-FEB-19	23-FEB-19
		Sampled Time	09:20	09:30	09:40	09:55	11:05
		Client ID	DC-1	DC-2	DC-3	DC-4	DC-5
Grouping	Analyte						
SOIL							
Physical Tests	Moisture (%)		36.9	36.4	51.7	77.0	89.0
Particle Size	% Gravel (>2mm) (%)		<1.0	<1.0	<1.0		
	% Sand (2.0mm - 0.063mm) (%)		46.4	32.7	35.9		
	% Silt (0.063mm - 4um) (%)		45.9	57.4	54.2		
	% Clay (<4um) (%)		7.7	9.7	9.8		
	Texture		Sandy loam	Silt loam	Silt loam		
Organic / Inorganic Carbon	Total Organic Carbon (%)		0.960	0.996	1.48		
Metals	Arsenic (As) (mg/kg)		6.03	6.47	6.63	6.80	2.68
	Cadmium (Cd) (mg/kg)		0.242	0.255	0.276	0.281	0.156
	Chromium (Cr) (mg/kg)		37.9	38.0	40.4	46.7	23.7
	Copper (Cu) (mg/kg)		30.0	31.2	36.1	36.6	14.1
	Lead (Pb) (mg/kg)		5.92	6.94	6.78	6.55	2.60
	Mercury (Hg) (mg/kg)		0.0445	0.0482	0.0498	0.0533	0.0285
	Nickel (Ni) (mg/kg)		40.7	41.2	43.7	46.4	22.4
	Zinc (Zn) (mg/kg)		64.7	96.7	78.5	77.5	34.7
Polycyclic Aromatic Hydrocarbons	Acenaphthene (mg/kg)		<0.050	<0.050	<0.050	<0.050	<0.050
	Acenaphthylene (mg/kg)		<0.050	<0.050	<0.050	<0.050	<0.050
	Anthracene (mg/kg)		<0.050	<0.050	<0.050	<0.050	<0.050
	Benz(a)anthracene (mg/kg)		<0.050	<0.050	<0.050	<0.050	0.054 ^{DLCI}
	Benzo(a)pyrene (mg/kg)		<0.050	<0.050	<0.050	<0.050	<0.050
	Benzo(b&j)fluoranthene (mg/kg)		<0.050	<0.050	<0.050	<0.050	<0.050
	Benzo(g,h,i)perylene (mg/kg)		<0.050	<0.050	<0.050	<0.050	<0.050
	Benzo(k)fluoranthene (mg/kg)		<0.050	<0.050	<0.050	<0.050	<0.050
	Chrysene (mg/kg)		<0.050	<0.050	<0.050	0.072 ^{DLCI}	<0.050
	Dibenz(a,h)anthracene (mg/kg)		<0.050	<0.050	<0.050	<0.050	<0.050
	Fluoranthene (mg/kg)		<0.050	<0.050	<0.050	<0.050	0.063 ^{DLCI}
	Fluorene (mg/kg)		<0.050	<0.050	<0.050	<0.050	<0.050
	Indeno(1,2,3-c,d)pyrene (mg/kg)		<0.050	<0.050	<0.050	<0.050	<0.050
	Naphthalene (mg/kg)		<0.050	<0.050	<0.050	<0.050	<0.050
	Phenanthrene (mg/kg)		<0.050	<0.050	<0.050	<0.050	<0.050
	Pyrene (mg/kg)		<0.050	<0.050	<0.050	1.71 ^{DLCI}	0.511
	Surrogate: Acenaphthene d10 (%)		93.7	93.3	97.4	96.8	99.8
	Surrogate: Chrysene d12 (%)		101.0	98.3	102.7	97.8	102.8
	Surrogate: Naphthalene d8 (%)		94.5	93.2	97.0	98.6	Not Reportable ^{SMI}
	Surrogate: Phenanthrene d10 (%)		86.4	85.7	105.0	90.1	94.7
B(a)P Total Potency Equivalent (mg/kg)		<0.020	<0.020	<0.020	0.028	0.045	

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID	L2236519-6 Sediment 23-FEB-19 11:10 DC-6	L2236519-7 Sediment 23-FEB-19 09:35 DC-7	L2236519-8 Sediment 23-FEB-19 09:35 DC-7		
Grouping	Analyte				
SOIL					
Physical Tests	Moisture (%)	90.9	93.8	93.8	
Particle Size	% Gravel (>2mm) (%)				
	% Sand (2.0mm - 0.063mm) (%)				
	% Silt (0.063mm - 4um) (%)				
	% Clay (<4um) (%)				
	Texture				
Organic / Inorganic Carbon	Total Organic Carbon (%)				
Metals	Arsenic (As) (mg/kg)	2.35	4.84		
	Cadmium (Cd) (mg/kg)	0.116	0.160		
	Chromium (Cr) (mg/kg)	23.9	27.0		
	Copper (Cu) (mg/kg)	15.8	15.3		
	Lead (Pb) (mg/kg)	3.59	2.43		
	Mercury (Hg) (mg/kg)	0.0700	0.0288		
	Nickel (Ni) (mg/kg)	19.9	21.8		
	Zinc (Zn) (mg/kg)	55.0	45.3		
Polycyclic Aromatic Hydrocarbons	Acenaphthene (mg/kg)	0.050	<0.050	<0.050	
	Acenaphthylene (mg/kg)	<0.050	<0.050	<0.050	
	Anthracene (mg/kg)	<0.050	0.096 ^{DLCI}	<0.050 ^{DLCI}	
	Benz(a)anthracene (mg/kg)	<0.050	0.051 ^{DLCI}	<0.060 ^{DLCI}	
	Benzo(a)pyrene (mg/kg)	<0.050	<0.050	<0.050	
	Benzo(b&j)fluoranthene (mg/kg)	<0.050	<0.050	<0.050	
	Benzo(g,h,i)perylene (mg/kg)	<0.050	<0.050	<0.050	
	Benzo(k)fluoranthene (mg/kg)	<0.050	<0.050 ^{DLCI}	<0.050	
	Chrysene (mg/kg)	<0.050	0.065 ^{DLCI}	<0.050	
	Dibenz(a,h)anthracene (mg/kg)	<0.050	<0.050	<0.050	
	Fluoranthene (mg/kg)	0.105	1.32	<0.050	
	Fluorene (mg/kg)	<0.050	<0.050	<0.050	
	Indeno(1,2,3-c,d)pyrene (mg/kg)	<0.050	<0.050	<0.050	
	Naphthalene (mg/kg)	<0.050	<0.050	<0.050	
	Phenanthrene (mg/kg)	0.221 ^{DLQ}	0.644 ^{DLCI}	<0.050 ^{DLCI}	
	Pyrene (mg/kg)	1.97	0.904 ^{DLCI}	<0.30 ^{DLCI}	
	Surrogate: Acenaphthene d10 (%)	98.0	87.5	98.8	
	Surrogate: Chrysene d12 (%)	105.4	94.2	117.7	
	Surrogate: Naphthalene d8 (%)	90.7	80.6	93.7	
	Surrogate: Phenanthrene d10 (%)	94.5	102.2	108.5	
	B(a)P Total Potency Equivalent (mg/kg)	<0.020	0.029		

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID	L2236519-1	L2236519-2	L2236519-3	L2236519-4	L2236519-5
		Description	Sediment	Sediment	Sediment	Sediment	Sediment
		Sampled Date	23-FEB-19	23-FEB-19	23-FEB-19	23-FEB-19	23-FEB-19
		Sampled Time	09:20	09:30	09:40	09:55	11:05
		Client ID	DC-1	DC-2	DC-3	DC-4	DC-5
Grouping	Analyte						
SOIL							
Polycyclic Aromatic Hydrocarbons	IACR (CCME) (mg/kg)	<0.15	<0.15	0.29	0.51	0.61	
	Total PAHs (mg/kg)	<0.20	<0.20	<0.20	1.78	0.63	
Polychlorinated Biphenyls	PCB-1016 (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.040	DLHM
	PCB-1221 (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.040	DLHM
	PCB-1232 (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.040	DLHM
	PCB-1242 (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.040	DLHM
	PCB-1248 (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.040	DLHM
	PCB-1254 (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.040	DLHM
	PCB-1260 (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.040	DLHM
	PCB-1262 (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.040	DLHM
	PCB-1268 (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.040	DLHM
	Total Polychlorinated Biphenyls (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.040	

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID	L2236519-6	L2236519-7	L2236519-8		
		Description	Sediment	Sediment	Sediment		
		Sampled Date	23-FEB-19	23-FEB-19	23-FEB-19		
		Sampled Time	11:10	09:35	09:35		
		Client ID	DC-6	DC-7	DC-7		
Grouping	Analyte						
SOIL							
Polycyclic Aromatic Hydrocarbons	IACR (CCME) (mg/kg)	0.27	0.52				
	Total PAHs (mg/kg)	2.34	3.08	<0.36			
Polychlorinated Biphenyls	PCB-1016 (mg/kg)	<0.050 ^{DLHM}	<0.050 ^{DLHM}				
	PCB-1221 (mg/kg)	<0.050 ^{DLHM}	<0.050 ^{DLHM}				
	PCB-1232 (mg/kg)	<0.050 ^{DLHM}	<0.050 ^{DLHM}				
	PCB-1242 (mg/kg)	<0.050 ^{DLHM}	<0.050 ^{DLHM}				
	PCB-1248 (mg/kg)	<0.050 ^{DLHM}	<0.050 ^{DLHM}				
	PCB-1254 (mg/kg)	<0.050 ^{DLHM}	<0.050 ^{DLHM}				
	PCB-1260 (mg/kg)	<0.050 ^{DLHM}	<0.050 ^{DLHM}				
	PCB-1262 (mg/kg)	<0.050 ^{DLHM}	<0.050 ^{DLHM}				
	PCB-1268 (mg/kg)	<0.050 ^{DLHM}	<0.050 ^{DLHM}				
	Total Polychlorinated Biphenyls (mg/kg)	<0.050	<0.050				

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

Reference Information

Qualifiers for Individual Samples Listed:

Sample Number	Client Sample ID	Qualifier	Description
L2236519-6	DC-6	L1S	Less than 1 gram of sieved soil or sediment was available for metals digestion. No significant impact on results is expected.

QC Samples with Qualifiers & Comments:

QC Type	Description	Parameter	Qualifier	Applies to Sample Number(s)
Duplicate		Phenanthrene	DUP-H	L2236519-8

Qualifiers for Individual Parameters Listed:

Qualifier	Description
DLCI	Detection Limit Raised: Chromatographic Interference due to co-elution.
DLHM	Detection Limit Adjusted: Sample has High Moisture Content
DLQ	Detection Limit raised due to co-eluting interference. GCMS qualifier ion ratio did not meet acceptance criteria.
DUP-H	Duplicate results outside ALS DQO, due to sample heterogeneity.
SMI	Surrogate recovery could not be measured due to sample matrix interference.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
C-TIC-PCT-SK	Soil	Total Inorganic Carbon in Soil A known quantity of acetic acid is consumed by reaction with carbonates in the soil. The pH of the resulting solution is measured and compared against a standard curve relating pH to weight of carbonate.	CSSS (2008) P216-217
C-TOC-CALC-SK	Soil	Total Organic Carbon Calculation Total Organic Carbon (TOC) is calculated by the difference between total carbon (TC) and total inorganic carbon. (TIC)	CSSS (2008) 21.2
C-TOT-LECO-SK	Soil	Total Carbon by combustion method The sample is ignited in a combustion analyzer where carbon in the reduced CO2 gas is determined using a thermal conductivity detector.	CSSS (2008) 21.2
HG-200.2-CVAF-VA	Soil	Mercury in Soil by CVAAS Soil samples are digested with hot nitric and hydrochloric acids, followed by CVAAS analysis. This method is fully compliant with the BC SALM strong acid leachable metals digestion method.	EPA 200.2/1631E (mod)
IC-CACO3-CALC-SK	Soil	Inorganic Carbon as CaCO3 Equivalent	Calculation
MET-200.2-CCMS-VA	Soil	Metals in Soil by CRC ICPMS Soil/sediment is dried, disaggregated, and sieved (2 mm). Strong Acid Leachable Metals in the <2mm fraction are solubilized by heated digestion with nitric and hydrochloric acids. Instrumental analysis is by Collision / Reaction Cell ICPMS. Limitations: This method is intended to liberate environmentally available metals. Silicate minerals are not solubilized. Some metals may be only partially recovered (matrix dependent), including Al, Ba, Be, Cr, S, Sr, Ti, V, W, and Zr. Elemental Sulfur may be poorly recovered by this method. Volatile forms of sulfur (e.g. sulfide, H2S) may be excluded if lost during sampling, storage, or digestion.	EPA 200.2/6020A (mod)
MOISTURE-VA	Soil	Moisture content This analysis is carried out gravimetrically by drying the sample at 105 C for a minimum of two hours.	CCME PHC in Soil - Tier 1 (mod)
PAH-SUM-CALC-VA	Soil	Sum of PAH's Total PAH represents the sum of all PAH analytes reported for a given sample. Note that regulatory agencies and criteria differ in their definitions of Total PAH in terms of the individual PAH analytes to be included.	CALCULATION
PAH-TMB-D/A-MS-VA	Soil	PAH - Rotary Extraction (DCM/Acetone) Polycyclic Aromatic Hydrocarbons in Sediment/Soil This analysis is carried out using procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846, Methods 3570 & 8270, published by the United States Environmental Protection Agency (EPA). The procedure uses a mechanical shaking technique to extract a subsample of the sediment/soil with a 1:1 mixture of DCM and acetone. The extract is then solvent exchanged to toluene. The final extract is analysed by capillary column gas chromatography with mass spectrometric detection (GC/MS). Surrogate recoveries may not be reported in cases where interferences from the sample matrix prevent accurate quantitation. Because the two isomers cannot be readily chromatographically separated, benzo(j)fluoranthene is reported as part of the benzo(b)fluoranthene parameter. Benzo(a)pyrene Total Potency Equivalents [B(a)P TPE] represents the sum of estimated cancer potency relative to B(a)P for all potentially carcinogenic unsubstituted PAHs, and is calculated as per the CCME PAH Soil Quality Guidelines reference document (2010).	EPA 3570/8270
PAH-TMB-H/A-MS-VA	Soil	PAH - Rotary Extraction (Hexane/Acetone) This analysis is carried out using procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846, Methods 3570 & 8270, published by the United States Environmental Protection Agency (EPA). The procedure uses a mechanical shaking technique to extract a subsample of the	EPA 3570/8270

Reference Information

sediment/soil with a 1:1 mixture of hexane and acetone. The extract is then solvent exchanged to toluene. The final extract is analysed by capillary column gas chromatography with mass spectrometric detection (GC/MS). Surrogate recoveries may not be reported in cases where interferences from the sample matrix prevent accurate quantitation. Because the two isomers cannot be readily chromatographically separated, benzo(j)fluoranthene is reported as part of the benzo(b)fluoranthene parameter.

Benzo(a)pyrene Total Potency Equivalents [B(a)P TPE] represents the sum of estimated cancer potency relative to B(a)P for all potentially carcinogenic unsubstituted PAHs, and is calculated as per the CCME PAH Soil Quality Guidelines reference document (2010).

PCB-SE-ECD-VA Soil PCB by Extraction with GCECD EPA 3570, 3620, 3660, 3665, 8082

This analysis is carried out using procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846, Methods 3570, 3620, 3660, 3665 & 8082, published by the United States Environmental Protection Agency (EPA). The procedure involves a solid-liquid extraction of a subsample of the sediment/soil using a mixture of hexane and acetone. Water is added to the extract and the resulting hexane extract undergoes one or more of the following clean-up procedures (if required): florisil clean-up, sulphur clean-up and/or sulphuric acid clean-up. The final extract is analyzed by capillary column gas chromatography with electron capture detection (GC/ECD).

PCB-SUM-CALC-VA Soil Total PCBs in soil CALCULATION

Calculation of Total PCB. Total PCB is the sum of the concentrations of PCB aroclors 1016, 1221, 1232, 1242, 1248, 1254, 1260, 1262, and 1268. Results below detection limit (DL) are treated as zero. The Total PCB detection limit is equal to the highest of the aroclor detection limits used in the sum.

PSA-PIPET+GRAVEL-SK Soil Particle size - Sieve and Pipette SSIR-51 METHOD 3.2.1

Particle size distribution is determined by a combination of techniques. Dry sieving is performed for coarse particles, wet sieving for sand particles and the pipette sedimentation method for clay particles.

Reference:

Burt, R. (2009). Soil Survey Field and Laboratory Methods Manual. Soil Survey Investigations Report No. 5. Method 3.2.1.2.2. United States Department of Agriculture Natural Resources Conservation Service.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
SK	ALS ENVIRONMENTAL - SASKATOON, SASKATCHEWAN, CANADA
VA	ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

mg/kg - milligrams per kilogram based on dry weight of sample.

mg/kg wwt - milligrams per kilogram based on wet weight of sample.

mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.

mg/L - milligrams per litre.

< - Less than.

D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



Location Map 1: Delta Cedar Sawmill LP - generally located at 10104 River Road, Delta, British Columbia; the orange polygon delineates the approximate boundary of the dredge area; the green, purple and red polylines delineate the approximate boundaries of the navigation channels.



Location Map 2: Delta Cedar Sawmill LP - approximate configuration / positioning of the flat barge and 80-ton crawler crane used for maintenance dredging activities within the log pocket (i.e., area fronting the log lift). There are typically three to four dredge events per year with this configuration (each dredge event is typically two-days); the barge would remain in the log-pocket area overnight (i.e., under the chip conveyor and behind steel pipe pile mooring dolphins). FRPD will monitor VHF Channels 69 & 72. Notifications [i.e., to VFPA Environmental Programs, Harbour Master and a NAVWARN (navigation.review@portvancouver.com) to be copied on NAVWARN submittal] would be distributed in accordance with the pending project permit and would include the dates, times, special requests (as needed) and means of preferred communication / emergency project contact information. Please refer to Location Map 3 for additional equipment and configuration that is used for maintenance dredging activities within the chip barge berth.



Location Map 3: Delta Cedar Sawmill LP - approximate configuration / positioning of the marine spud derrick and material barge for maintenance dredging activities outside of the log-pocket area (i.e., as depicted in Location Map 2). There are typically one to two dredge events per year with this configuration (each dredge event is typically two - four days). The derrick and barge would be spudded-down / moored within the chip barge berth overnight. White marking lights would be positioned on the outside (i.e., riverward) corners of the equipment during overnight periods. FRPD will monitor VHF Channel 69. Notifications (i.e., to VFPA Environmental Programs, Harbour Master and a NAVWARN (navigation.review@portvancouver.com to be copied on NAVWARN submittal]) would be distributed in accordance with the pending project permit and would include the dates, times, special requests (as needed) and means of preferred communication / emergency project contact information.



April 01, 2022

Vancouver Fraser Port Authority
100 The Pointe, 999 Canada Place
Vancouver, BC V6C 3T4

submitted via the online VFPA Permit Portal

Dear members of the project and environmental review team,

**RE: DELTA CEDAR PRODUCTS LTD. - DELTA SAWMILL 10075 RIVER ROAD, DELTA, BC
Project and Environmental Review Application - Maintenance Dredging**

Fraser River Pile & Dredge (GP) Inc. (FRPD) has prepared the following submittal package on behalf of Delta Cedar Products Ltd. (Applicant) in support of the Vancouver Fraser Port Authority's (VFPA) project and environmental review process under the auspices of the Port Authorities Operations Regulations of *the Canada Marine Act* and Section 82 of the *Impact Assessment Act*. The Tenant requires maintenance dredging works at their Delta Cedar Sawmill, generally located adjacent to 10075 River Road, Delta, British Columbia.

The Applicant respectfully requests a multiyear Project Permit for the works. Maintenance dredging activities are anticipated to commence in June 2022.

1.0 PROJECT LOCATION

The Delta Cedar Sawmill is generally located adjacent to 10075 River Road, Delta, British Columbia; the proposed works would occur within the VFPA-leased water lot DEL322-02101F-001.

The Applicant operates a dimensional lumber sawmill specializing in the processing of cedar logs and has been in operation for more than 60 years. Logs are delivered to the site via the Fraser River; logs are processed upland, resulting in product (dimensional lumber) and wood chips. Wood chips are temporarily stockpiled within the upland area, then loaded onto chip barges for transport to another facility for use. Maintenance dredging is required within their water lot tenure area in order to re-establish the required depth(s) to ensure safe access for vessels, barges and/or other water-based equipment

Please refer to Figure 1 for a depiction of the dredge footprint and surrounding area.

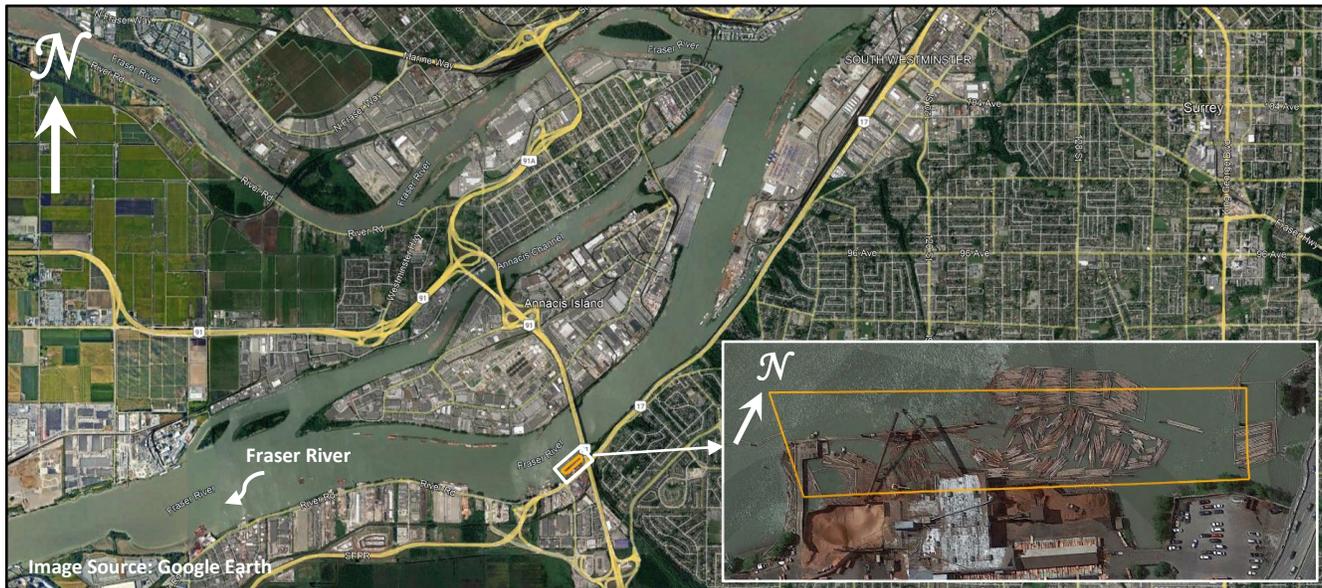


Figure 1: Delta Cedar Products Ltd. - generally located adjacent to 10075 River Road, Delta, British Columbia. The orange polygon delineates the approximate footprint of the dredge area.

2.0 PROPOSED WORKS

Maintenance dredging is typically required three to four times per year at this location; the facility would not be able to maintain their operations without conducting these works. The materials are not being extracted for commercial value, but rather to re-establish the required depths to ensure continued safe navigation / access for dozer-boats, barges and support vessels (e.g. tugboats). The total dredge / disposal volume is no more than 12,000 cubic metres per year.

The maintenance dredging works would be conducted from the water. A clamshell dredge (i.e. crane fitted with a clamshell bucket) situated on a marine spud derrick and/or flat barge would be used to conduct the works. The derrick and/or barge would be towed along the Fraser River to and from the site with a tugboat. Equipment access from upland areas is not required (i.e. there would not be any impacts to upland vegetation or ground disturbance). The derrick would maintain position via spuds that penetrate the riverbed while conducting the maintenance dredging works; the barge with a clamshell crane would be secured to existing infrastructure (e.g. piles). The clamshell bucket would be used to extract accumulated sediments and woody debris from the delineated area; the bucket would then be swung over to a barge located alongside the derrick, or onto the barge with the crane, where the dredged materials would be deposited. Once the barge(s) is loaded at the end of day, it would be towed via tugboat down the Fraser River to the Point Grey disposal at sea site [(i.e. in accordance with a site-specific disposal at sea permit from Environment and Climate Change Canada (ECCC)]. The empty barge(s) would then be transported back upstream to the project location and loaded again the next day (as required).

Maintenance dredging is routinely conducted to remove accumulated sediments and woody debris and from within the logs hanging / storage areas and chip barge berth. The intention of the maintenance

dredging is to remove only the high spots within the overall dredge footprint. The proposed works would not impact riparian and/or instream vegetation (i.e. instream vegetation is absent within the work area). The materials to be removed are comprised primarily of silts and sands with intermixed wood debris in the log handling areas. The dredge area boundaries aligned along / parallel with upland areas are delineated by infrastructure (e.g. sheet-pile wall, pile supported dock and log-lift infrastructure); these serve as visual (and physical) barriers for the clamshell dredge operator.

The maintenance dredge footprint encompasses a total area of approximately 13,810 square metres (m²); please refer to Figure 1 for a depiction of the dredge area. The total dredge / disposal volume is no more than 12,000 cubic metres per year. Maintenance dredging activities were last conducted in February 2022, December 2021, October 2021 and July 2021 under VFPA Project Permit 18-050 (valid until February 28, 2022).

3.0 HABITAT ASSESSMENT

A desktop review was undertaken to identify potential flora (absent from within the footprint of the Project), fauna and habitat areas that may occur within and adjacent to the Project location.

The desktop review included, but was not limited to the following information sources:

- Fraser River Estuary Management Program (FREMP) - Environmental Management Strategy for Dredging in the Fraser River Estuary¹;
- Fraser River Estuary Management Program & Burrard Inlet Environmental Action Program (FREMP-BIEAP) habitat mapping²;
- Conservation Data Centre iMapBC - Species and Ecosystems at Risk³;
- Stewardship Baseline Objectives Tool (SBOT) for White Sturgeon (2019) - DRAFT⁴;
- Fisheries and Oceans Canada (DFO) Aquatic Species at Risk Mapping (i.e. under *Species at Risk Act*)⁵; and
- British Columbia Species and Ecosystems Explorer⁶.

3.1 Overview

The project site is located just downstream of the Alex Fraser Bridge, within an industrial / commercial area west of Highway 91. The bankfull width of the channel at this location is estimated at approximately 575 metres. Tidal influence is present at this location; this segment of the river is

¹ Fraser River Estuary Management Program. 2006. Environmental Management Strategy for Dredging in the Fraser River Estuary.

² FREMP - BIEAP Habitat Atlas. http://www.cmnbc.ca/atlas_gallery/frempe-bieap-habitat-atlas (accessed March 11, 2022)

³ Conservation Data Centre iMapBC. <http://maps.gov.bc.ca/ess/hm/cdc/> (accessed March 11, 2022).

⁴ BC Stewardship Baseline Objectives Tool. 2019. <https://www2.gov.bc.ca/gov/content/environment/natural-resource-stewardship/resource-stewardship-tools/sbot> (accessed March 11, 2022)

⁵ Fisheries and Oceans Canada. <http://www.dfo-mpo.gc.ca/species-especes/sara-lep/map-carte/index-eng.html> (accessed March 11, 2022).

⁶ BC Species & Ecosystems Explorer. <https://a100.gov.bc.ca/pub/eswp/> (accessed March 10, 2022).

referred to as 'South Arm Meso-Tidal'¹, as depicted in Figure 2. The Fraser River conveys approximately 85 - 90 percent of the total Fraser River discharge¹.

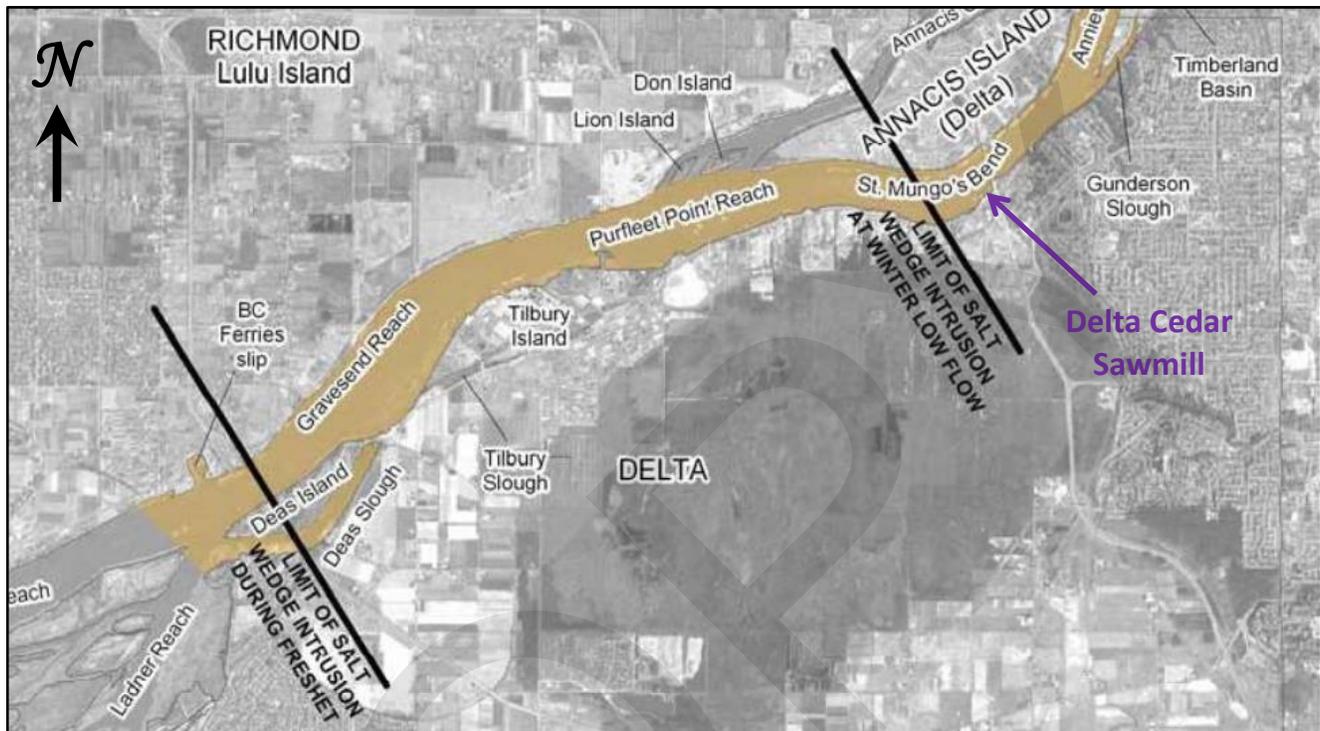


Figure 2: Delta Cedar Sawmill - FREMP¹ image depicting the 'South Arm Meso-Tidal' section of the river (highlighted gold); approximate limits of the salt wedge intrusion are also delineated for low- and high-flow (freshet) conditions.

The salt wedge is present within the lower reaches of the Fraser River (including the North Arm) and is generally comprised of a clear layer of salty water that penetrates up the river during flood tide conditions, while a layer of siltier freshwater water floats overtop the denser saltwater layer. The distance at which the salt wedge penetrates upstream reaches is primarily dependent on the freshwater flow conditions within the river; the salt wedge may penetrate as far upstream as Annacis Island (main arm) and half-way up the North Arm during low flow conditions⁷. The subject project location is likely at the upper limits for potential salt wedge penetration during low flow conditions.

The shoreline fronting the dredge area had been classified as a combination of 'green' and 'red' (i.e. low and high productivity in regards to fish habitat, respectively) by the Fraser River Estuary Management Program & Burrard Inlet Environmental Action Program²; Figure 3 depicts the associated shoreline classifications in relation to the project location. There were not any habitat compensation sites located in proximity (i.e. within 500 metres) of the project location².

⁷ Thomson, R.E. 1981. Oceanography of the British Columbia Coast. Can. Spec. Fish. Aquat. Sci. 56: 291 p.



Figure 3: Delta Cedar Sawmill - FREMP-BIEMP Habitat Atlas² - shoreline colour coding is used to demonstrate relative values of habitat features, with green, yellow and red being low, moderate and high productivity, respectively².

A single habitat compensation site was identified² within proximity to the dredge area; please refer to Figure 4 for the approximate location of this site. The eastern (upstream) site was compensation works for the Annacis Crossing Project².



Figure 4: Delta Cedar Sawmill - FREMP-BIEMP Habitat Atlas² - habitat compensation site delineated by the red polygon².

The proposed works would not adversely impact the adjacent shoreline / riparian areas and/or the habitat compensation site (located upstream / east of the proposed works); boundaries of the dredge area are delineated by infrastructure (e.g. sheet-pile wall, pile supported dock and log-lift infrastructure and dolphins).

3.2 Substrates

A substrate sampling program was last undertaken within the dredge area on February 23, 2019 in accordance with the Disposal at Sea Regulations of the *Canadian Environmental Protection Act, 1999* administered by ECCC. Substrates collected during the sampling event were comprised of sediments and woody debris material. The sediments were generally comprised of silt (approximately 53 percent), sand (approximately 38 percent) and clay (approximately 9 percent); please refer to Figure 5 for a depiction of the 2019 sample locations.

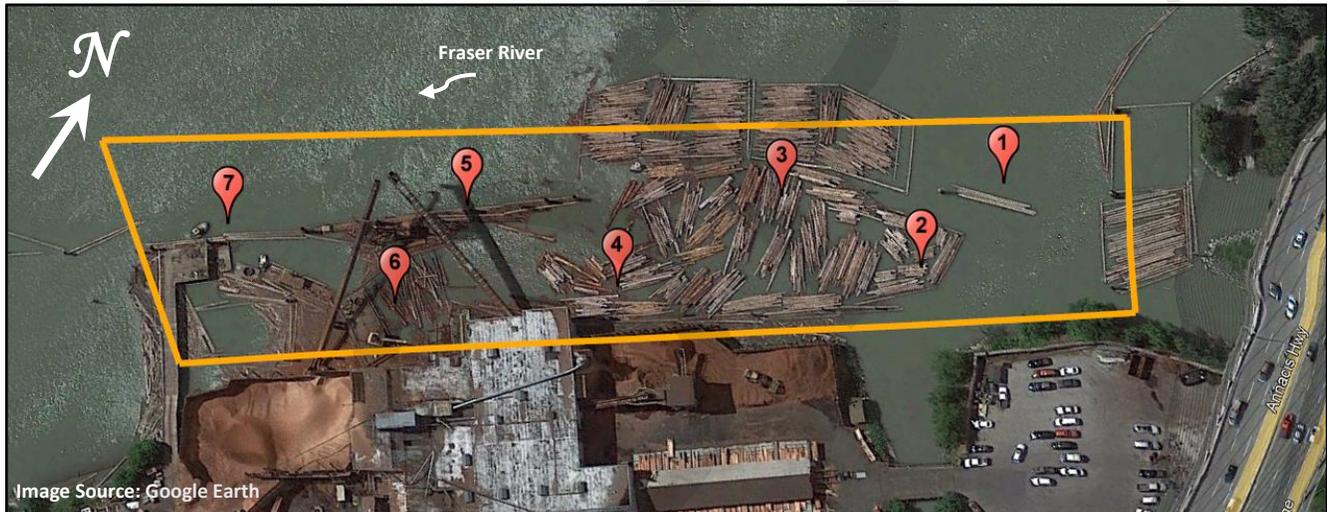


Figure 5: Delta Cedar Sawmill - aerial overview of the dredge footprint (orange polygon) and substrate sample locations (numbered icons) from the February 2019 sampling event.

Analyses of the substrate samples documented a total polycyclic aromatic hydrocarbon (PAH) concentration of 3.08 mg/kg (i.e. greater than the disposal at sea screening level of 2.5 mg/kg) at sample location '7'. The sample was comprised of bark and appeared to be an anomaly, given previous sampling / site history (i.e. the site is dredged three to four times per year) and no evidence of sheen / spill. The laboratory conducted a second analysis with a new aliquot of the same sample and documented a total PAH concentration of <0.36 mg/kg. Four (4) of the 7 samples exceeded the Canadian Council of Ministers of the Environment (CCME) Interim Sediment Quality Guidelines for copper, with the highest result of 36.6 mg/kg, which is not uncommon for sediment in the Fraser River. Toxicity results from the Fraser River estuary have shown that copper concentrations less than 40 mg/kg are unlikely to result in toxic effects on benthic test organisms. The mean and 95% upper confidence limit of the mean of all samples for copper were 25.6 and 33.1 mg/kg, respectively.

The material has been approved for disposal at sea; substrate samples are valid through February 2024.

3.3 Fish

The lower Fraser River provides important habitat for over 25 species of fish⁸, including Pacific salmon (e.g. coho (*Oncorhynchus kisutch*), chum (*O. keta*), chinook (*O. tshawytscha*), sockeye (*O. nerka*) and pink (*O. gorbuscha*)); the river also supports winter and summer runs of steelhead salmon (*O. mykiss*). In addition to Pacific salmon and steelhead, the Fraser River supports coastal cutthroat trout (*O. clarkii clarkii*), white sturgeon (*Acipenser transmontanus*), green sturgeon (*Acipenser medirostris*), eulachon (*Thaleichthys pacificus*) and smelt (*Spirinchus sp.*) and non-migratory species such as prickly sculpin (*Cottus asper*), peamouth chub (*Mylocheilus caurinus*), redbelt shiner (*Richardsonius balteatus*) and northern pikeminnow (*Ptychocheilus oregonensis*)⁸.

Please refer to Figure 6 for a summary of potential species at risk within the vicinity of the Applicant's sawmill identified from the Conservation Data Centre iMapBC online mapping tool³.



Figure 6: Delta Cedar Sawmill - Conservation Data Centre iMapBC³ results in the vicinity of the project area: CDC ID 8546 identifies White Sturgeon (*Acipenser transmontanus*; Lower Fraser River Population); and CDC ID 72705 identifies Pacific Water Shrew (*Sorex bendirii*).

Please refer to Figure 7 for a summary of potential adult/sub-adult and juvenile white sturgeon holding habitat and spawning areas within the vicinity of the Applicant's sawmill identified from the SBOT online mapping tool⁴.

⁸ Richardson, J.S., T.J. Lissimore, M.C. Healy and T.G. Northcote. 2000. Fish Communities of the Lower Fraser River (Canada) and a 21-year Contrast. *Environmental Biology of Fishes* 59:125-140.

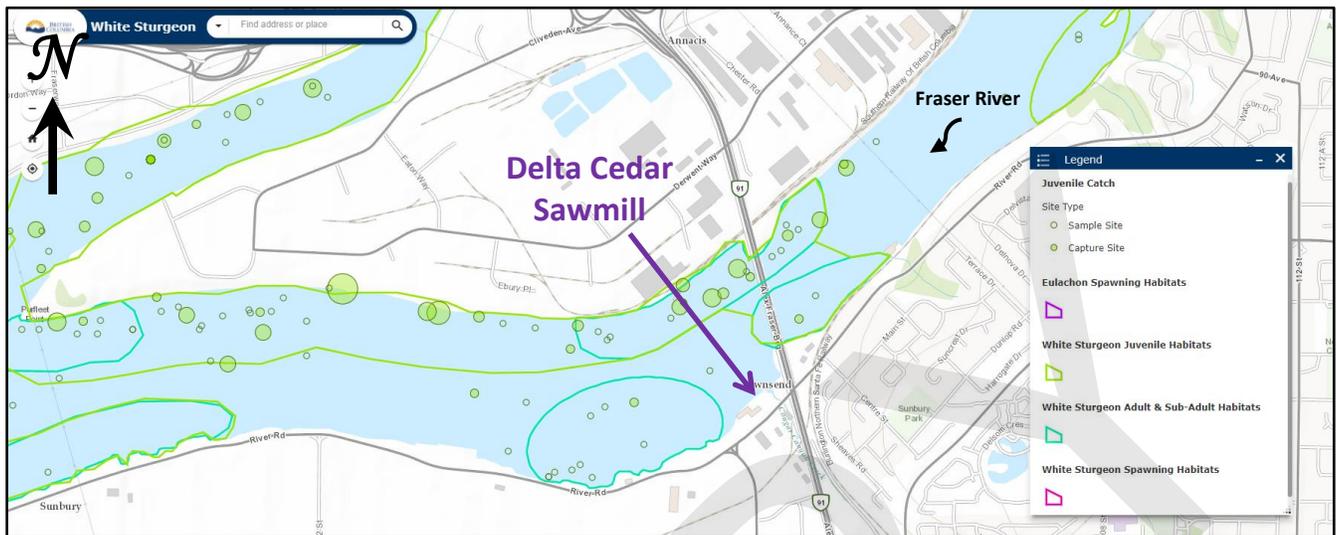


Figure 7: Delta Cedar Sawmill - Stewardship Baseline Objectives Tool for White Sturgeon (Draft)⁴: adult/sub-adult and juvenile white sturgeon holding habitats were identified adjacent to (upstream and downstream and across the river from) the subject dredge area; white sturgeon and eulachon spawning habitats were not identified in proximity to the subject dredge area; juvenile capture records were documented in areas around the subject dredge area.

Please refer to Figure 8 for a summary of potential aquatic species at risk within the vicinity of the Applicant’s sawmill identified from DFO’s online mapping tool⁵.



Figure 8: Delta Cedar Sawmill - Fisheries and Oceans Canada Aquatic Species at Risk Map⁵ - there were not any critical habitat areas identified within one kilometre of the subject project location; however, green sturgeon (‘Special Concern’) were identified as having the potential to occur in the general area (yellow shaded polygon).

Please refer to Table 1 for a summary of aquatic species at risk identified as having the potential to occur within the lower Fraser River and tributaries from the British Columbia Species and Ecosystems Explorer online tool⁶.

Name	BC Status ^a	SARA ^b	Likelihood of Occurrence near Project Location
Green Sturgeon (<i>Acipenser medirostris</i>)		Special Concern	Low: has the potential to occur, however, rarely observed in Fraser River; unlikely to be impacted by the works given mitigation measures
White Sturgeon - Lower Fraser River Population (<i>Acipenser transmontanus pop. 4</i>)	Red	-	High: white sturgeon are known to occur in the general project location
Brassy Minnow (<i>Hybognathus hankinsoni</i>)	Blue	-	Low: typically associated with slow-moving waters common to backwaters and sloughs
Nooksack Dace (<i>Rhinichthys cataractae</i>)	Red	Endangered	Low: only documented to occur locally in the Fraser Valley, in four small streams
Mountain Sucker (<i>Catostomus platyrhynchus</i>)	Blue	Special Concern	Low: known to occur at higher gradient reaches (typically upstream of Abbotsford)
Salish Sucker (<i>Catostomus sp. 4</i>)	Red	Threatened	Low: known to occur only within a few small streams in the vicinity of Langley and Aldergrove
Longfin Smelt (<i>Spirinchus sp. 1</i>)	Red	-	Low: restricted to two lakes in lower mainland (Pitt and Harrison Lakes)
Eulachon (<i>Thaleichthys pacificus</i>)	Blue	-	High: eulachon may transit through the project areas (i.e. both as adults and larvae); known spawning locations not identified within the general project location; timing of works will avoid key spawning migration period and outgoing (downstream) migration of larvae drift (i.e. post egg hatch)
Cutthroat Trout (<i>Oncorhynchus clarkii clarkii</i>)	Blue	-	Medium: likely transit / migrate through the areas; may forage in the areas; typically spawn in gravels of small low gradient streams (known to occur in Cougar Creek; confluence with the Fraser River is immediately south of the subject dredge area); commonly use off-channel habitats of smaller streams for overwintering
Bull Trout (<i>Salvelinus confluentus</i>)	Blue	-	Low: have specific habitat requirements, including clear, cool waters for spawning and overhead cover; the project location does not provide the typical habitat requirements for this species

^a BC Conservation Data Centre Risk Ranking: Red = Any species or ecosystem that is at risk of being lost (extirpated, endangered or threatened); Blue = Any species or ecosystem that is of special concern

^b Federal Species at Risk Act Rankings: Special Concern = A wildlife species that may become a threatened or an endangered species because of a combination of biological characteristics and identified threats; Threatened = A wildlife species that is likely to become endangered if nothing is done to reverse the factors leading to its extirpation or extinction; Endangered = A wildlife species that is facing imminent extirpation or extinction

3.4 Marine Mammals

Marine mammals, such as harbour sea (*Phoca vitulina*), Stellar sea lion (*Eumetopias jubatus*), California sea lion (*Zalophus californianus*) and harbour porpoise (*Phocoena phocoena*) may transit up the Fraser River. River otters (*Lontra canadensis*) are also known to occur within the Fraser River and may forage within / adjacent to the project footprint.

3.5 Waterfowl

“Waterfowl utilization (e.g. roosting and feeding) is mainly concentrated in intertidal marshes and mudflats along the shoreline, however some diving ducks do utilize deeper water for foraging for fish”¹. Waterfowl usage is likely more predominate along the shoreline, outside of the active log handling and barge mooring (dredge) area.

4.0 POTENTIAL IMPACTS AND IMPACT MITIGATION

Potential adverse impacts to these and other aquatic species would be mitigated through the implementation of best management practices.

4.1 Timing

Estuarine timing windows for the protection of fish and fish habitat, including their eggs, juveniles, and spawning adults, for in-water works in the Fraser River Estuary at this location are established by DFO as June 16 - February 28 (from George Massey Tunnel / Oak Street Bridge to Mission Bridge)⁹. VFPA Project Permit 18-050 permitted dredging activities between:

- June 15 and July 15; and
- October 1 and February 28.

The summer dredging window is critical for the facility to maintain their operations; the sediment accumulation from March through June results in draft restrictions for their equipment. The Applicant requests a summer dredging window for the proposed Project Permit.

4.2 Turbidity

Containment of suspended sediments with such barriers as silt curtains are not applied to dredging associated with conventional maintenance activities in the lower Fraser River. Silt curtains within the river are not practical due to fluvial and tidal currents, along with floating debris that gets snagged and tears the curtain. Other means of containment, such as steel sheet pile, are cost-prohibitive and not appropriate for the scale of works proposed and the risk to environmental values. As such, suspended sediments are not physically contained within the immediate work area; however, the transport of suspended solids generated by dredging activities is relatively localized and transitory¹. Clamshell dredging works typically result in a visible plume (suspended solids), or ‘halo’ around the clamshell bucket as it breaks the water surface. The plume is typically most visible within approximately 30 - 100 metres of the immediate work area.

⁹ **Fisheries and Oceans Canada.** British Columbia Marine/Estuarine Timing Windows for the Protection of Fish and Fish Habitat - South Coast and Lower Fraser Areas. <http://www.dfo-mpo.gc.ca/pnw-ppe/timing-periodes/bc-s-eng.html#area-29> (accessed October 19, 2021).

This was substantiated during the urgent maintenance dredge event at Delta Cedar Sawmill on March 10, 2021; Keystone Environmental Ltd. (Keystone) provided environmental monitoring services for this dredge event. The visible plume from dredging activities was restricted to the area immediately surrounding the derrick¹⁰; the plume was estimated to be approximately 100 m² in size¹⁰. Exceedances of water quality criteria specified in the Project Permit were not recorded outside of the immediate dredge area (i.e. greater than 50 metres from active dredging)¹⁰. The highest turbidity level measured during the dredge event was 48.4 NTU at a depth of approximately one metre above the riverbed, at a distance of approximately 10 metres from the dredge¹⁰; the background level at this depth was 28.2 NTU¹⁰; the turbidity level at this depth at a distance of approximately 50 metres from the dredge was 26.5 NTU¹⁰, just below the background level.

Turbidity levels within the Fraser River fluctuate with the seasonal flow level conditions; turbidity levels may vary in any given year from less than 10 NTUs to greater than 250 NTUs¹¹. Turbidity levels within the lower reaches of the Fraser River on November 16 and 17, 2021 exceeded 550 NTUs¹¹.

FRPD will implement any combination of the following mitigation measures whenever practicable:

- position equipment to minimize migration of suspended solids from the immediate work area (i.e. in some areas, when feasible, the derrick can be positioned down current of the work area, with the barge secured to the outside; the two pieces of equipment can move up and down the dredge area in tandem);
- operators will be appropriately trained and qualified and familiar with the operational area;
- raising loaded buckets slowly through the water column;
- only using single-grabs (i.e. per cycle) into the sediments to reduce the number of impact waves of suspended sediment from the clamshell bucket hitting the river-bed and to minimize the loss from the clamshell reopening for subsequent grabs; and
- operators will ensure that the bucket is fully emptied into the scow before swinging the bucket back over the water.

4.3 Marine Mammals

Marine mammals, such as sea lions, harbour porpoises and seals may transit up the Fraser River. The proposed timing of the works will occur outside of the key spawning periods for fish, such that these animals are not expected to be following eulachon and other species upstream for feeding purposes. These marine mammals may be 'curious' about the work activities and approach the area in search of prey items mobilized by dredging; however, they are unlikely to be adversely impacted by the works.

As per recent recommendations from DFO for such activities, **if there is any risk to marine mammals from direct contact with vessels or equipment, the works would be temporarily suspended until the individual has left the area or has not been sighted for 30 minutes.**

¹⁰ Clark, D. 2021. Delta Cedar Products Ltd. Dredge Monitoring Report; Project Date: March 10, 2021. Prepared by: Keystone Environmental Ltd. Prepared for: Fraser River Pile & Dredge (GP) Inc. 10 pages.

¹¹ Canada. <https://aquatic.pyr.ec.gc.ca/RealTimeBuoys/Default.aspx> (accessed March 10, 2022).

4.4 Sturgeon

Green Sturgeon are anadromous, maturing in marine waters and returning to freshwaters for spawning; spawning is not known to occur in Canadian rivers^{12,13}. Green Sturgeon are rarely observed in Canadian freshwaters; however, they may spend time in brackish waters at the mouths of large rivers. The majority of the proposed mitigation measures for white sturgeon are relevant for green sturgeon as well.

As per Project Permit 18-050 and Figure 7 in Section 3.3, the subject dredge area is located immediately adjacent to white sturgeon hold areas (adult and juvenile). To reduce potential impacts on white sturgeon, dredging is only permitted to occur between:

- June 15 and July 15; and
- October 1 and February 28.

A soft-start (i.e. to deter fish from the immediate area) will be implemented immediately prior to commencing dredging activities by slowly lowering the closed clamshell bucket onto the riverbed and opening and closing the bucket at least once.

4.5 Eulachon and Other Fish

Dredging will also occur outside of the normal period of upstream migration for adult eulachon, and take place on the bottom, such that dredging works are not anticipated to cause harm to or kill adult eulachon or other fish transiting within the water column. Eulachon return every year to the lower Fraser River to spawn when they are three to four years of age¹⁴. Historically, most (not all) spawning has occurred upstream of New Westminster and on occasion, in the mouths of large tributaries such as the Pitt River where the influence of lower salinity water is greater¹⁵. Eulachon typically spawn in the lower Fraser River in April or May; however, local Indigenous Groups have indicated that spawning runs may on occasion occur as early as February or March¹⁶.

A 2009 report authored by LGL Limited was prepared for the Kwikwetlem First Nation and the Watershed Watch Salmon Society to study the potential impact of the construction of the new Port

¹² COSEWIC. 2013. COSEWIC status appraisal summary on the Green Sturgeon *Acipenser medirostris* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xvi pp.

¹³ Fisheries and Oceans Canada. <http://dfo-mpo.gc.ca/species-especies/profiles-profilis/green-sturgeon-esturgeon-vert-eng.html> (accessed June 2, 2021).

¹⁴ Cambria Gordon Ltd. 2006. Eulachon of the Pacific Northwest: A life history. Prepared for the Living Landscapes Program, Royal B.C. Museum, Terrace, B.C.

¹⁵ Hay, D., and P. B. McCarter. 2000. Status of the eulachon *Thaleichthys pacificus* in Canada. Canadian Stock Assessment Secretariat, Research Document 2000/145, Fisheries and Oceans Canada, Nanaimo, B.C.

¹⁶ Fisheries and Oceans Canada. 2021. Integrated Fisheries Management Plan Summary - Fraser River Eulachon (*Thaleichthys pacificus*) Pacific Region 2021. <https://www.pac.dfo-mpo.gc.ca/fm-gp/implans/eulachon-eulakane-ifmp-pgip-sm-eng.pdf>. (accessed April 12, 2021).

Mann Bridge on the Fraser River eulachon population¹⁷. The report referenced a DFO test fishery based in New Westminster from 1995-2005 that indicated that the Fraser River eulachon run typically starts near the end of March, peaks around the third week of April and holds at this intensity through the second week of May, then ends during the third week of May²⁰. The subject works would occur outside of the typical spawning migration.

The proposed works will also occur outside of the period of the most active downstream migration of juvenile salmonids. Pelagic fish species, especially salmonids, tend to express avoidance behaviour in regards to dredging activities and sediment plumes¹⁸. It is unlikely that maintenance dredging will cause harm to or kill juvenile salmonids¹⁹.

4.6 Benthic Invertebrates

In addition to the fish species likely present in the vicinity of the subject works at various times of the year, the river bed substrates within/adjacent to the proposed works may be habitat for benthic invertebrates. Aquatic ecosystems are comprised of complex matrices that connect several tiers of consumers to each other. Epifaunal and infaunal benthic invertebrates form a critical link between organic debris and detritus and fish, including species of management and/or conservation concern, such as white sturgeon, eulachon and salmon¹⁹.

Benthic invertebrates are sensitive to short-term environmental impacts as they are sessile or have limited mobility and are not typically able to escape physical removal/entrainment¹⁹. Maintenance activities, in particular dredging of the river bottom, will temporarily interrupt the number of invertebrates present within the dredged area, but are not expected to alter benthic habitats for invertebrates in that dredging involves removal of the upper layer of sediment deposits that have occurred naturally over time (no change in type of substrate exposed). The magnitude of effects on invertebrates, and upon fish that prey on such invertebrates, is dependent upon effects upon the riverine benthic community as a whole, and upon the tenure of such effects on the abundance, structure and membership of the assemblage within the immediate zone of impact and upon overall riverine community¹⁹.

Dredging will suspend sediments within the water column. The above-referenced studies did not evaluate the effects of the settlement of suspended solids on benthic invertebrate communities down current of dredging activities. Lasting effects, however, are unlikely. Such communities are acclimatized

¹⁷ **Plate, E.M. 2009.** Fraser River, Port Mann Bridge-Douglas Island Eulachon Study, 2009. July 13, 2009. Prepared for: Kwikwetlem First Nation and the Watershed Watch Salmon Society, Coquitlam, BC. Prepared by: LGL Limited and Terra Remote Sensing Incorporated, Sidney, BC. 29 pages.

¹⁸ **ECORP Consulting, Inc. 2009.** Literature Review (for studies conducted prior to 2008): Fish Behaviour in Response to Dredging and Dredged Material Placement Activities (Contract No.W912P7-07-0079). Prepared for: US Army Corps of Engineers, San Francisco, CA. 48p + tables.

¹⁹ **Adams, M.A., and E. Fairhurst. 2015.** Section 9 *Water Act* Master Approval – Lower Fraser River Inwater Facilities Maintenance Works – Environmental Risk Assessment. August 28, 2015 letter report. *Prepared for:* Fraser River Pile & Dredge (GP) Inc., New Westminster, BC. *Prepared by:* Envirowest Consultants Inc., Port Coquitlam, BC. xv + 38p + appendices.

to the 'rain' of sediments from the water column¹⁹. The riverbed of the Fraser River is not a static environment; it is a transitory environment to which benthic invertebrate communities are highly adapted. The risk to benthic invertebrates, whereby the pressure may impair the viability of the benthic invertebrate community within and in proximity to the area of maintenance works, is low¹⁹.

Channel substrates within the proposed dredge area are typically comprised of naturally deposited silts and sands and woody debris from log handling activities. Accumulation of woody debris may limit the diversity of benthic organisms able to colonize the area²⁰. The benthic community is likely limited to opportunistic species tolerant of such conditions. The composition of sediments within the proposed dredge area is not expected to change post-dredging.

4.7 General Mitigation Measures

In addition to the aforementioned mitigation measures, potential adverse impacts associated with the Project works shall be mitigated through implementing BMPs that may include, but not be limited to the following:

- All works will be conducted in accordance with applicable Local, Provincial and Federal environmental regulations.
- All equipment being transported to the site will be clean/free of excess grease and oils and in good operating condition.
- Site surveys, where necessary, will be completed prior to commencement of the Project works. The limits of construction (i.e. dredge footprints) will be clearly communicated to FRPD crew.
- Vegetation and Water - FRPD will not destroy, remove or clear trees and shrubs, or disturb intertidal areas (i.e. outside of the footprint of the proposed works).
- Dangerous Goods - Dangerous goods, such as welding supplies, paints, primers and preservatives will be stored in secure totes or stowage and handled in such a manner as to prevent their inadvertent release to the environment.
- Compliance - FRPD will ensure that its workers are fully aware of the importance of maintaining good water quality in the surrounding marine environment (e.g. discuss during morning toolbox talk).
- In order to protect fish and fish habitat and the quality of water, FRPD will:
 - have work crews monitor the position of the derrick/barge in relation to the shoring and take into consideration the height of tidal waters, magnitude of prevailing winds, direction of tidal currents or other factors that may influence vessel positioning;
 - ensure that vessels are not grounded, except in an absolute emergency situation, where no other alternative is available and human life is endangered;
 - all activities will be undertaken only during suitable weather conditions, unless proven mitigation can be implemented;
 - vessel movements will be limited and slow at start up; and

²⁰ **McDaniel, N.G. 1973.** A Survey of the Benthic Macroinvertebrate Fauna and Solid Pollutants in Howe Sound. Fisheries Research Board of Canada. Technical Report No. 385. 37p. + appendices.

- implement the BMPs and mitigation measures provided in previous sections of this document to help ensure that deleterious substances will not be released into the marine environment and that the Project works will not result in harmful impacts to fish or fish habitat.

4.8 Archaeological Management

Given the subject scope of works (i.e. maintenance dredging of the riverbed), the potential for encountering archaeological or heritage resources is anticipated to be low. The subject maintenance dredging works are to remove only accumulated sediments and woody debris since the last dredge event and restore design water depths / riverbed grades.

However, in the event that potential archaeological resources are encountered and/or suspected, then activities must be halted and FRPD's Archaeological Chance Find Management Plan (CFMP) for maintenance dredging projects within the lower Fraser River (included in Attachment A) shall be immediately implemented. The CFMP was presented to key FRPD clamshell dredging personnel by the Musqueam Archaeology Department on June 24, 2021.

5.0 POTENTIAL EFFECTS TO AQUATIC ECOSYSTEMS

Review of DFO's website identified the following potential pathways of effects for dredging activities, placement of material or structures in water and use of industrial equipment²¹:

- **Change in food supply:** *The aquatic food supply must be plentiful and diverse to sustain the productivity of a watershed. An increase or decrease in the quantity or composition of the food supply, beginning with plants and organic debris that fall into a waterway, can alter the structure of the aquatic community.*
 - The subject works would not alter / adversely impact adjacent riparian vegetation (i.e. would not effect leaf litter / organic depositions).
 - The works would target high spots within the overall dredge footprint (i.e. may not be adversely impacting benthic invertebrates throughout the entire area).
- **Change in habitat structure and cover:** *The addition of in-stream organic structure and the deposition of eroded soil can affect the capacity of a watercourse to maintain a dispersed and diverse community of aquatic organisms by restricting habitat connectivity and the opportunities for organisms to use, colonize, and move between existing aquatic environments. The removal of in-stream and riparian vegetation can reduce channel stability, cover and protection from predators and physical disturbances, and the availability of diverse and stable habitats.*

²¹ Fisheries and Oceans Canada. <https://www.dfo-mpo.gc.ca/pnw-ppe/pathways-sequences/index-eng.html> (accessed October 20, 2021).

- The subject maintenance dredging activities would not remove / adversely impact any vegetation (emergent instream vegetation is absent and the works would not impact / encroach upon riparian vegetation).
- **Change in sediment concentrations:** *Increased erosion of stream bank soils and rocks result in an excess of fragmented organic and inorganic material which is transported by water, wind, ice, and gravity. These sediments, which contain nutrifying elements and can capture or absorb contaminants, are suspended or else settle and collect in waterways affecting physical processes, structural attributes, and ecological conditions such as water clarity (by reducing visibility and sunlight and damaging fish gills) and reducing the availability and quality of spawning/ rearing habitat (through infilling).*
 - The subject maintenance dredging activities would not engage / remove / disturb the adjacent shoreline.
 - Turbidity may be temporarily increased (i.e. generally within approximately 30 metres from the immediate area and returning to background levels within 50 - 100 metres of the clamshell bucket).
- **Change in contaminant concentrations:** *An increase in concentrations of toxins and pollutants in sediments and waters can breach the range of chemical parameters that support healthy aquatic communities, seriously affecting fish and fish habitat. The ecological effects can range from direct fatality to organisms, alteration of the ecosystem structure through changes in the abundance, composition, and diversity of communities and habitats, and persistence and progressive accumulation in sediments or biological tissues (bioaccumulation, biomagnification). Deformities, alterations in growth, reproductive success, and competitive abilities can result.*
 - Please refer to Section 3.2 for details in regards to the substrate sampling program for the subject location; substrates sampled / analysed were within the allowable thresholds for disposal at sea.
 - All equipment being transported to the site will be clean / free of excess grease and oils and in good operating condition. FRPD has comprehensive preventative-maintenance and equipment inspection programs.
 - FRPD has established Spill Prevention and Emergency Spill Action Procedures in place (provided in Attachments B and C, respectively).
- **Change in nutrient concentrations:** *Some activities may cause an increase in nutrifying elements such as nitrogen and phosphorus and mineral compounds such as ammonia, nitrates, nitrites, orthophosphates. This leads to 'eutrophication', thick growths of aquatic plants (especially algae) that block light needed by aquatic vegetation, either by clouding the water column or coating the vegetation itself. When the algae die, they settle to the bottom and are consumed by bacteria during the decomposition process. This process consumes oxygen, depleting it from bottom waters. The resulting low dissolved oxygen concentrations drive fish from their preferred habitat and can cause other organisms to die.*
 - Eutrophication is not a concern in the lower Fraser River.

- **Potential mortality of fish/eggs/ova from equipment:** *Direct injury or mortality of fish (eggs, larvae, invertebrates, etc.) from physical disruption from equipment or livestock.*
 - The subject works would coincide with the lower-risk in-water works window for this area (i.e. works are proposed for June 16 - February 28); therefore, there is a lower potential for encountering fish during sensitive life stages (e.g. juvenile salmon transiting downstream and/or eulachon transiting upstream for spawning). In addition, the following dredging windows are proposed as per the previous VFPA Project Permit:
 - June 15 and July 15; and
 - October 1 and February 28.

6.0 **ADDITIONAL REGULATORY REVIEW**

6.1 **Fisheries and Oceans Canada**

The subject works would comply with DFO's interim code of practice for routine maintenance dredging²², as indicated below:

- *There are no SARA-listed shellfish, or critical habitat or residences of freshwater endangered or threatened aquatic species present in the work zone or the affected area.*
 - There are not any SARA-listed shellfish, or critical habitat or residences of freshwater endangered or threatened aquatic species identified within the dredge area (i.e. as identified within Figure 8).
 - Green sturgeon have the potential to occur within the general area; mitigation measures are proposed and summarised in this correspondence (and within the pending sturgeon assessment report being prepared by Keystone Environmental Ltd.).
- *Polychlorinated biphenyls (PCB) analysis of the substrate to be dredged has been undertaken within the last 5 years and you were not required to apply mitigation measures over and above best management practices for dredging.*
 - PCB analysis of the substrates was last undertaken during the September 2020 sampling program; measured concentrations were all below the disposal at sea screening level of 0.1 mg/kg (i.e. highest measured / calculated concentration was <0.05 mg/kg).
- *Dredging to be conducted within an area that has been dredged within the past 10 years.*
 - Maintenance dredging activities within the Applicant's sawmill dredge area most recently occurred in February 2022, December 2021, October 2021 and July 2021.
- *Project does not include propeller wash dredging.*
 - The subject maintenance dredging works are to be conducted with a clamshell dredge; propeller wash dredging will not be conducted.
- *The project is not temporarily or permanently increasing the existing footprint of the dredge and disposal areas.*

²² Fisheries and Oceans Canada. <http://www.dfo-mpo.gc.ca/pnw-ppe/codes/dredge-drageur-eng.html> (accessed March 10, 2022).

- The subject maintenance dredging works are to be conducted within the same footprint as the previous maintenance dredging works; the material will be transported to and disposed of within the boundaries of an existing disposal at sea site (e.g. Point Grey) in accordance with the applicable disposal at sea permit (pending approval) and/or placed upland for reuse / disposal in accordance with applicable regulations.
- *Dispose of dredged material and stabilize it on land following provincial legislation or dispose of dredged material in an approved Marine Disposal and Dumping Site.*
 - The dredged materials are to be transported to and disposed of within the boundaries of an existing disposal at sea site (e.g. Point Grey) in accordance with the applicable disposal at sea permit (pending approval) and/or placed upland for reuse / disposal in accordance with applicable regulations.
- *Incorporate the applicable measures in this code of practice and all other applicable measures to Protect Fish and Fish Habitat.*
 - *Timing windows:* the works would be conducted within the lower-risk timing window of June 16 - February 28. In addition, the following dredging windows are proposed as per the previous VFPA Project Permit:
 - June 15 and July 15; and
 - October 1 and February 28.
 - *Dredging:*
 - The intention of the subject maintenance dredging works is to only remove accumulated sediments and woody debris (i.e. high spots). Dredge cut depth(s) would be consistent with previous dredging activities at this location.
 - The marine-based equipment would be spudded-down within the footprint of the dredge area and moored at the existing barge berth overnight (if necessary). Sensitive fish habitats are absent within these areas.
 - *Limit impacts on riparian vegetation:*
 - The subject maintenance dredging activities would not remove / adversely impact any vegetation and/or shoreline banks; the works are limited to the removal of accumulated sediments and woody debris on the riverbed. Upland access / disturbances are not required for the works.
 - *Limit impacts on habitat components:*
 - Habitat / complexing features are absent within the subject dredge area.
 - *Ensure proper sediment control:*
 - A QEP will provide oversight of the dredging activities; *in-situ* water quality monitoring (turbidity) will be conducted.
 - The QEP / Environmental Monitor will have the authority to halt, temporarily stop, or alter (in consultation with FRPD/Applicant) active works as necessary.
 - *Deleterious substances:*
 - Dredged materials are to meet the criteria for disposal at sea and/or upland placement (e.g. British Columbia Contaminated Sites Regulation).

- FRPD has established Spill Prevention and Emergency Spill Action Procedures in place.
- All equipment being transported to the site will be clean/free of excess grease and oils and in good operating condition. FRPD has comprehensive preventative-maintenance and equipment inspection programs.
- Any release, or threat of a release to water will be reported to the applicable agencies, as per FRPD's Emergency Spill Action Procedure.

6.2 Environment and Climate Change Canada

The works would be conducted under a site-specific disposal at sea permit administered by ECCC under the Disposal at Sea Regulations of the *Canadian Environmental Protection Act, 1999*. The current permit (4543-2-03720-02) has a validity date of June 22, 2021 - June 21, 2022); this permit is eligible for two additional renewals (i.e. then a new disposal at sea permit application would required).

6.3 Transport Canada

Maintenance dredging works are considered 'minor works' pursuant to subsection 28(2) of the *Canadian Navigable Waters Act* and as such, may proceed without approval from Transport Canada as long as they comply with the requirements of the Minor Works Order. A notification of a minor work in accordance with the requirements set out on the Navigation Protection Program External Submission Site would be completed prior to the actual commencement of dredging activities.

Thank you for your attention to this matter and do not hesitate to contact me at rcochrane@frpd.com or 604-528-9343 should you have any questions and/or require additional information

Yours truly,

FRASER RIVER PILE & DREDGE (GP) INC.

Rob Cochrane, B.Sc., PBDipl.

Regulatory Compliance and Environmental Manager

Attachments: A: Archaeological Chance Find Management Plan
B: Spill Prevention and Response Procedure
C: Emergency Spill Action Procedure

ATTACHMENT A:

Archaeological Chance Find Management Plan

COPY



MUSQUEAM
ARCHAEOLOGY
DEPARTMENT

Archaeological Chance Find Management Plan

Prepared for:

Robert Cochrane
Regulatory Compliance &
Environmental Manager
FRASER RIVER PILE & DREDGE
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D. 604-528-9343
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Date: December 8, 2020

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Glossary

Archaeology: The study of humanity’s past through the excavation of sites and the analysis of artifacts and other physical remains.

Archaeological Feature: A non-portable trace of human activity. Some examples are pits, walls, and ditches.

Belonging/Artifact: An item made or given shape by humans, such as a tool or a work of art. In BC, many First Nations prefer the term belonging, as it reinforces a direct connection between living people and the material goods produced by their ancestors.

BC Archaeology Branch: The provincial government Branch responsible for tracking archaeological field programs, government permits, and reporting on provincially governed land. They do not have direct control over archaeological processes on Federal Land, although many Federal institutions in BC rely on Archaeology Branch maintained standards and practices to ensure a high quality of work.

Introduction

Archaeology is the study of past people and behaviours through the materials and marks they have left behind. The context of these materials and marks allow for those trained in their interpretation to describe the scene, like a crime scene investigator – pulling together clues in an attempt to best describe what happened, where it happened, when it happened, who was involved, and why.

To Indigenous peoples, archaeology is not just a study of the past and human history. Archaeological resources (ie. archaeological sites, belongings, features) are part of the fabric that make up Indigenous cultural heritage which also includes, but is not limited to, songs and stories, histories and teachings, places and people. Together all of these things shape Indigenous worldview and identity and are an integral part of the way Indigenous peoples see and situate themselves in the world and navigate everyday existence. As such, archaeological research and study is an important way to uncover past lifeways but it is just one way. It is worth noting that in many cases Indigenous peoples have all of the knowledge of how their ancestors lived and died without needing archaeology. Many Indigenous groups have very detailed and precise records of their own histories and past that should be considered in conjunction with archaeological evidence when trying to build a comprehensive image of past lifeways.

In BC, archaeological sites on Provincial land is protected under the Heritage Conservation Act (HCA). The HCA protects all archaeological sites, regardless of their status as formally recorded or registered. The penalty for knowingly or unknowingly disturbing archaeological resources is substantial fines and possible jail time. There is no Federal legislation in place to protect archaeological resources and so the HCA does not apply to projects that take place on federal land. However, many of BC's Indigenous peoples have their own heritage policies and permit requirements in place. These policies and requirements are supported by the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) which recognizes past and continued discrimination, forced assimilation, and other grave human rights abuses that Indigenous peoples face worldwide. The UNDRIP, under Article 11 recognises that:

Indigenous peoples have the right to... maintain, protect and develop the past, present, and future manifestations of their cultures such as archaeological and historical sites, artefacts, designs, ceremonies, technologies... (UN 2008)

A chance find management plan (CFMP) document is designed to help those less familiar with archaeological practices and procedures to prevent damage to archaeological sites and their context in the event that archaeological resources are encountered in the absence of a professional archaeologist. The CFMP functions to raise awareness of the types of archaeological materials and archaeological features that may be encountered by crews performing ground disturbing activities, tree felling, or other activities that may disturb or destroy archaeological sites and lays out simple instructions for field personnel to follow in the event of a chance find to ensure the appropriate protocols and procedures are followed. In order to ensure success in the identification of archaeological resources, a CFMP document is paired with on-site training for all applicable project staff.

Context

Fraser River Pile & Dredge (FRPD) have recently been requested by BC Ministry of Forestry, Lands, and Natural Resource Operations and Rural Development to revise their existing FRPD Chance Find Procedure and that key personnel be trained in archaeological procedures. To this end, Musqueam Archaeology Department have assembled this Chance Find Management Plan.

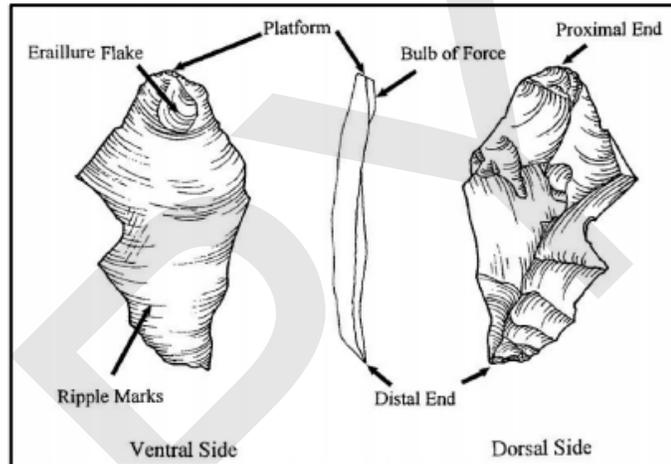
Given that the scope and the specific locations of the project have not yet been defined, an archaeological Chance Find Management Plan (CFMP) has been recommended. Additionally, the project area is in close proximity to the Fraser River as such there is always the potential to encounter cultural heritage resources without a formal archaeological study to indicate otherwise. A CFMP can help in ensuring that heritage resources are not disturbed. Many critically important archaeological and heritage sites line the Fraser River, and previous dredging programs in similar contexts have identified archaeological materials within the dredgate.

This area and the surrounding landscape have been used and occupied by local First Nations since time immemorial. Like many places in the territory, First Nations ancestors lived, died, hunted, fished, gathered/harvested and traveled in this area. The physical evidence of their use can be found in nearby recorded archaeological sites, there are over 500 archaeological sites on the shores of the Fraser River within the Lower Mainland area alone. The continued importance of and connection to this place to local First Nations is evidenced in the proximity to numerous recorded placenames, among other things. The Fraser River was the location of large village and city sites since time immemorial.

Stone

Many of the tools peoples used in the past were made out of materials that typically don't survive for long periods of time after being discarded. Because of this much of what's left are the tools or by-products from tool making that are made of materials that do not degrade easily over time. This includes tools made of stone and the materials deposited as the by-product of stone tool production.

Flakes: The most abundant type of lithic. It is identifiable from other stone shards by its anatomy. Typically struck from smooth, fine grained rocks, flakes feature a number of identifiable features, as laid out in the image to the right. Flakes are usually considered a by-product created during the production of other types of stone tools, but many flakes themselves are used as small, easy to make cutting tools. Flakes are typically made of fine-grained material.



Projectile Points: A stone worked either through grinding (such as the grey point on the right) or flaking into a sharp point (such as the red point on the right). Sometimes referred to as arrowheads, projectile points can also be affixed spears or atlatl darts.



Adzes: Stone woodworking tools formed by grinding a stone into a wedge shape, with one end sharpened for chopping/cutting. These were often passed through generations, as they take immense time and effort to manufacture.



Hand-Mauls: Stone implements used for a variety of pounding related tasks. These are also carefully ground down from larger stones, and much like adzes, taken considerable time and effort to manufacture. Often these are discarded when broken or used until worn down.



Slate Knives: Ground stone blades. May feature one or more sides ground into a sharp cutting edge. These types of blades are often associated with fish cleaning.



Other Works: There are many other types of stone belongings that do not fall into the categories above, including many artistic representations, or other ceremonially significant items. A bowl is pictured right as an example.



Bone, Antler, Shell, and Plant Materials

Biological materials are also common in archaeological sites. The skeletal or shell remains of animals may be present in a variety of forms. Additionally, in anaerobic contexts, it is possible for plant material to be preserved. Sometimes in the form of fibers, but other times in the form fully woven blankets, baskets, or other works.

Fauna: Animal bones are often found in archaeological sites. They can show what was being eaten or hunted. Pictured to the right are salmon vertebrae, common in sites along the Fraser River.



Bones Points and Other Bone Implements:

Animals were not hunted solely for food. Their bones were often used to make tools. To the right are a series of bone harpoon points (left), used for hunting sea life, as well as a bone awl (middle) and a net gauge (far right).



Artistic or Ceremonial Representations:

Much like stone, bone also was carved for various artistic or ceremonial purposes. An example is pictured on the right.



Preserved Organics: Certain sediments have the ability to preserve organic material in stasis, slowing its decay. These preserved organics are rare and they are extremely fragile. The image on the right shows several pieces of wood lashed together with cordage.



Shell Objects: In the world before settler colonialists, shells were also an important raw material. The animals themselves were collected for food, but their shells were often worked into beads and other implements. The photo on the right is a larger shell bead.



Soils and Features

Ancestors on the landscape left more than just their belongings behind. In many cases, the traces they left take on the form of alterations to the landscape. Humans have the capacity to change the ground they live on in a number of ways. Sometimes this results in changes to the sediments in a way archaeologists can identify. These are considered “anthropogenic” or man-made soils. Features, on the other hand, are non-portable alterations to the landscape, such as hearths, mounds, postholes, or cairns. Below are descriptions of some of the more common types of soils and features people leave behind.

Cultural Shell Deposit:

These are soils produced as physical debris from daily life accumulates over time. The high shell content helps preserve organic material. These soils are common in coastal archaeological sites, and the amount of shell present can vary significantly (in the image to the right, the left soil has sparse shell, while the image on the far right is much denser). These deposits are often referred to as “shell midden”.



Mounds and Cairns: These landforms are often funerary features, and caution is advised when working around them. Material, sometimes including stones, is piled to protect the remains of ancestors. The image on top right is a mound of soil, and on the bottom right is a stone cairn.



Cultural Depressions: These pits were intentionally excavated by ancestral First Nations people. Sometimes they were intended for use as cache pits, or sometimes they represent roasting pits. Sometimes the pit feature is visible on the ground, but sometimes they become infilled and are only visible in profile during excavation.



Hearths: To the right is an image of a hearth. It is visible as the light coloured layer of ash with darker material above, and fire-reddened soil below.

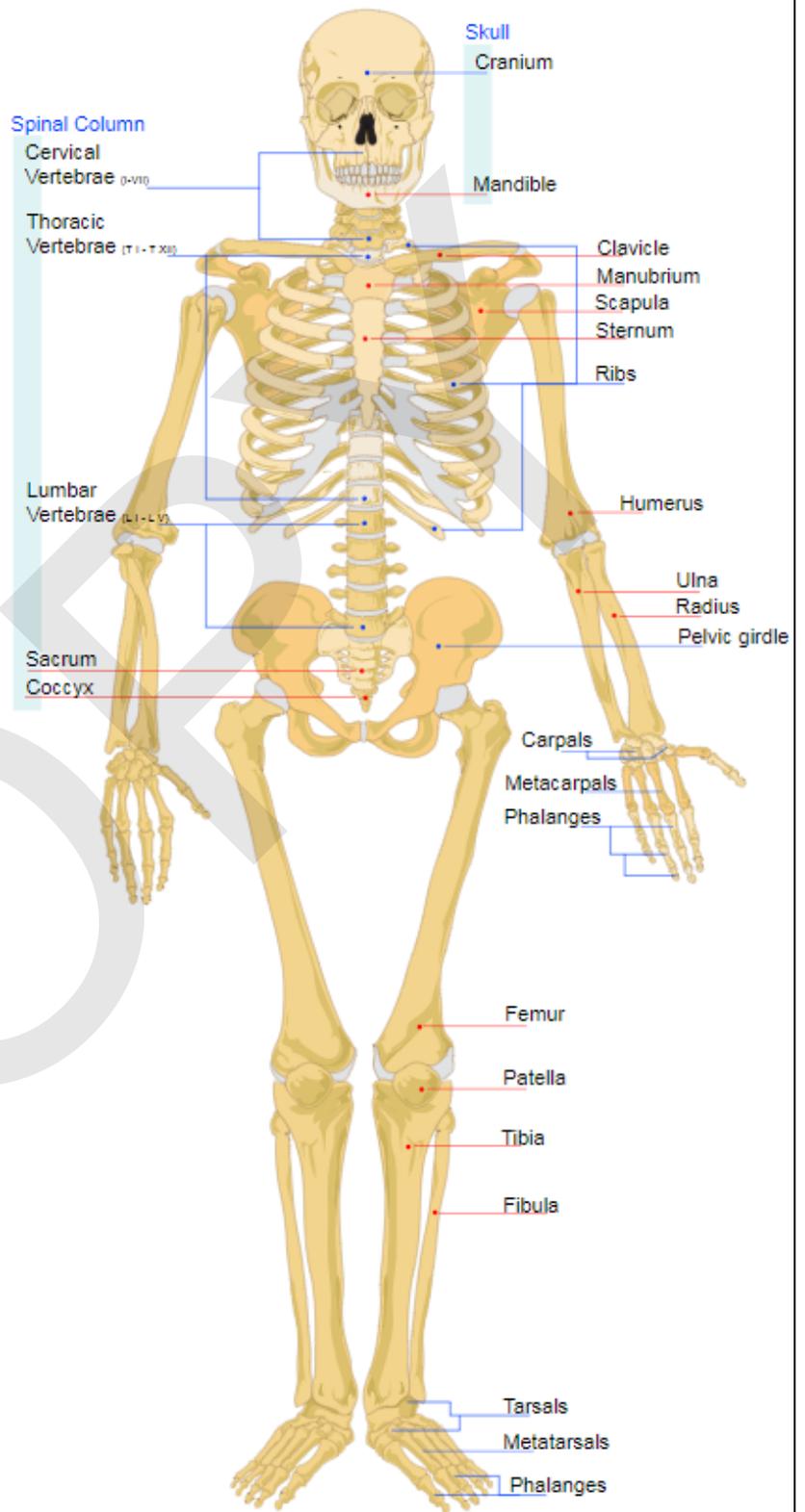


Structural Features: Sometimes the remains of former structures are preserved under the ground. This type of archaeological feature can help archaeologists reconstruct these former structures. To the right are images of the remnants of a fishing weir, and a post hole.



Ancestral Remains

While performing ground disturbing activities, there is often a possibility that ancestral remains will be encountered. These remains represent more than just bones, and must be treated with the utmost respect at all times. It is often difficult to identify skeletal material as human, and so if there is any doubt that you may have encountered human remains, contact your project manager immediately and allow an archaeologist to make the distinction.



What to Do in the Event of a Chance Find

Step 1: Hold Up!

Stop work in the immediate vicinity of the find. If you have to pick it up to examine it, make sure you mark the exact spot the find was originally located in. You can use some flagging tape or pin flagging to mark the place.



Step 2: Take a Photo!

Take a photo of the item in its original context with a scale (You can use your hand for a scale). You may need to send this to an archaeologist later on. **Do NOT post any photos of archaeological sites or items on social media. If the find is suspected to be ancestral remains DO NOT take a photo, instead cover the ancestor with a tarp, blanket, or other material and limit access to the area.**



Step 3: Reach Out!

Contact your foreman, who will contact the project manager. Once the project manager has been notified they will contact Musqueam's Senior Archaeologist in order to determine next steps.



Archaeologist Actions if permits have been obtained:

Contact First Nations to inform them of the find and discuss implications. If no special considerations are required, archaeologists will proceed with the methodology laid out in their permits.

Archaeologist Actions with no permit:

Stop work, and contact First Nations. With approval from the relevant Nations, the archaeologist will begin permit application process if appropriate. Work will remain halted in the area until permits are obtained or other agreements can be made with the First Nations.

In federally legislated areas (such as ports, airports, and reserves), the permitting process may be foregone with the understanding that other arrangements will be made to keep relevant First Nations abreast of developments and finds.

Contact Information

Fraser River Pile & Dredge (GP) Inc.

Project Manager: Robert Cochrane (FRASER RIVER PILE & DREDGE (GP) INC. | SINCE 1911)

Project Manager Phone #: D: 604-528-9343 M: 604-374-8897

Musqueam Archaeology Department:

Liz Campbell (Operations Coordinator): elizabeth.campbell@musqueam.bc.ca//1-778-384-9375

Kody Huard (Field Director): khuard@musqueam.bc.ca//1-778-828-1909

BC Archaeology Branch:

Reception: 1-250-953-3334

COPY

Steps to Follow

Step 1: Hold Up!

Stop work in the immediate vicinity of the find. If you have to pick it up to examine it, make sure you mark the exact spot the find was originally located in. You can use some flagging tape or pin flagging to mark the place.



Step 2: Take a Photo!

Take a photo of the item in its original context with a scale (You can use your hand for a scale). You may need to send this to an archaeologist later on. Do NOT post any photos of archaeological sites or items on social media. If the find is suspected to be ancestral remains, DO NOT photo, instead cover the ancestor with a tarp, blanket, or other material and limit access to the area.



Step 3: Reach Out!

Contact your foreman, who will contact the project manager. Once the project manager has been notified they will contact a professional archaeologist or the project archaeologist (if there is one) in order to determine next steps.



Archaeologist Actions:

Stop work, and contact First Nations. With approval from the relevant Nations, the archaeologist will begin permit application process if appropriate. Work will remain halted in the area until permits are obtained or other agreements can be made with the First Nations. In federally legislated areas (such as ports, airports, and reserves), the permitting process may be foregone with the understanding that other arrangements will be made to keep relevant First Nations abreast of developments and finds.

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Project Manager: Robert Cochrane
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Kody Huard (Field Director):
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1-778-828-1909



STONE

Flakes: The most abundant type of lithic. It is identifiable by a smooth grained stone with a flat platform on one side and a sharp, tapering edge on the other.



Projectile Points: Also sometimes called arrowheads, these were sharp points used for hunting.



Adzes: A wood-working tool formed by grinding a stone into a wedge shape with a sharp edge for cutting. These were passed on through a wood-workers generation as they are so difficult to make.



Hand-Mauls: Used for a variety of pounding related tasks. Made by grinding a larger stone into the desired shape.



Slate Knives: Ground stone blades for cleaning fish.

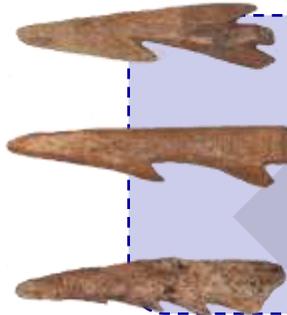


BONE & ORGANICS

Fauna: Animal bones are often found in archaeological sites. They can show what was being eaten and or hunted. Pictured to the right are salmon vertebrae, common in sites along the Fraser River.



Bone Points: Animals were not hunted solely for food. Their bones were often used to make tools, like the bone harpoons pictured on the left.



Worked Bone: Animal bones were also used for other tools including net shuttles, bark beaters, and weaving implements.



Preserved Organics: Certain sediments have the ability to preserve organic material in stasis, slowing its decay. These preserved organics are rare, and they are extremely fragile. Cordage wrapped around wood is pictured on the left.



SOILS and Features

Cultural Shell Deposits: These are soils produced as physical debris from daily life accumulates over time. The high shell content helps preserve organic material. These soils are common in coastal archaeological sites, and the amount of shell can vary significantly.



Mounds & Cairns: These landforms are often funerary features. Material, often stones, are piled to protect the remains of ancestors.



Cultural Depressions: These pits were intentionally excavated by ancestors for storage, or sometimes as roasting pits. The pits are sometimes visible on the surface, or sometimes as a concave layer in the stratigraphy.



ATTACHMENT B:

Spill Prevention and Response Procedure

COPY



Environmental Policy



ENVIRONMENTAL MANAGEMENT ENVIRONMENTAL PROCEDURES EP-04 SPILL PREVENTION AND RESPONSE

VERSION 01 | NOVEMBER, 04, 2020 [HSE-ENV-CMP-PRO-0004]

Fraser River Pile & Dredge (GP) Inc.
www.frpd.com



Marine & Infrastructure



Land Foundations



Dredging



DOCUMENT HISTORY

DOCUMENT LOCATION

This is an online document. Paper copies are valid only on the day they are printed. Refer to FRPD SharePoint Intranet for latest version.

REVISION HISTORY

Description	
Original Author(s)	HSEQ
Creation Date	2019-Mar-25
Approved By	Sarah Clark
Change Record Number	SharePoint Document Management System

Risk Ranking	Assessment Date	Risk Assessor	Review Schedule	Next Review Date
<1>	2021.11.04	HSEQ Director	Annually	2022.11.04

Version	Revision Date	Author(s)	Approved By	Revision Notes
1.0	2020.11.04	RCEM	RCEM	<ul style="list-style-type: none"> Added information in regards to inspecting spill kit contents Added requirements to notify DFO and Transport Canada

1. PURPOSE

This document provides an overview of the procedures and Best Management Practices (BMPs) adopted and implemented by FRPD in regards to spill prevention and contingency. In addition to this EG, project and/or equipment-based procedures may be developed on a case-by-case basis to address specific requirements and/or concerns.

2. SCOPE

This procedure applies to the recording and tracking of environmental non-conformances during the process of construction, procurement, product and services provided by FRPD.

3. ROLES AND RESPONSIBILITIES

Role	Responsibilities
Employees, Contractors and Visitors	<ul style="list-style-type: none"> immediately report or raise any actual or suspected / potential environmental spills / releases.
Supervisors	<ul style="list-style-type: none"> the FRPD Supervisor ☐ the FRPD Supervisor (e.g. Supervisor can be a Foreman, General Foreman, Superintendent, Project Coordinator or Project Manager) is typically responsible for proper spill prevention and implementation of spill response procedures on the jobsite may also be responsible for submitting the initial Intellex incident notification responsible for ensuring that adequate spill response supplies are readily available and replenished post-incident
Manager	<ul style="list-style-type: none"> responsible for ensuring that adequate resources (e.g. spill response supplies, training) are available for each project ensure inspections / audits are conducted, documented and reported as per the specified schedule keep client apprised of any environmental incidents and follow-up actions help determine if a third-party contractor should be employed to assist in clean-up efforts and/or environmental monitoring ensure that any action items are completed and documented
HSEQ Department	<ul style="list-style-type: none"> stay up to date with relevant spill reporting regulations report environmental spills to external agencies (as applicable) upon being advised of an incident and/or eminent incident provide support (as needed) throughout the environmental incident investigation process complete follow-up reporting to external agencies (e.g. end-of spill report) as required

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	<ul style="list-style-type: none"> • help determine if a third-party contractor should be employed to assist in clean-up efforts and/or environmental monitoring • work with the HSEQ Manager and Project Managers in continuously working towards environmental incident reductions • monitor the progress of corrective actions and review of their effectiveness • review each corrective action for effectiveness • report to senior management on the status of all NCRS and associated trends as part of the Management Review Meetings
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4. PROCEDURE

The Spill Prevention and Response Procedure identifies:

- roles and responsibilities;
- measures to minimize the potential for a spill to occur;
- proper storage of materials;
- general spill response measures;
- internal and external reporting requirements; and
- FRPD employee spill related training.

4.1. MEASURES TO MINIMIZE THE POTENTIAL FOR A SPILL TO OCCUR

Always wear appropriate personal protective equipment (PPE) whenever handling materials (i.e. including product and waste items). At a minimum, PPE should include hard hat, eye protection, gloves, high-visibility vest/pfd and safety footwear in accordance with FRPD’s Occupational Health & Safety Program. If uncertain as to whether or not additional and/or alternative PPE may be required for your situation, please contact the HSEQ Manager (contact information provided in Section 9).

Ensure that all hazardous and potentially hazardous materials (e.g. oil products, fuels, compressed gases) are transported, stored and handled in accordance with all applicable regulations. Care is to be taken while transporting and/or moving items onsite (i.e. particularly liquids); always use appropriate equipment and/or assistance from other employees when handling large/heavy/awkward items.

4.2. THE PROPER STORAGE OF MATERIALS

Products and waste items are to be stored in accordance with all applicable regulations. Ensure all containers are properly labeled with the contents. Flammable hazardous substances, such as fuels, are to be stored in containers that have the

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appropriate CSA designation and approval; small quantities of fuels (i.e. <20 litres) will be stored in appropriate fuel storage boxes.

Dangerous goods/chemicals, such as paints, primers, solvents and preservatives are to be stored in secure bins and handled in a manner that prevents their inadvertent release to the environment; used items will be properly contained within leak-proof containers and disposed of at an appropriate facility when no longer needed or empty.

Secondary containment will be provided for applicable items whenever required and/or practicable.

Additional storage containers may be required at jobsites to temporarily store items (e.g. waste items) prior to disposal / recycling. Proper planning in advance of the job start-up will help identify these items and the required storage containers to ensure compliance with regulatory requirements and improve the overall health, safety and environmental components.

4.3 SPILL CONTINGENCY

At least one fully-stocked spill kit will be supplied to every FRPD jobsite/marine derrick.

The minimum contents for the spill kits are documented in the Environmental Guideline titled 'Spill Kit Contents - Marine Derricks / Jobsites' available on the SharePoint site. Contents include:

- 1 - spill tray
- 3 - bags of oil absorbent pads
- 1 - bag of universal absorbent pads
- 2 - bags of absorbent booms (4 lengths)
- 2 - rolls of electrical tape
- 1 - box of green nitrile gloves
- 4 - pairs of chemical resistant gloves
- 6 - large heavy-duty bags for used absorbents
- 2 - bands to seal the spill kit
- 1 - container of leak sealing putty

In addition, each marine derrick and/or jobsite toolbox will have the following supplies:

- roll of large heavy-duty bags
- shovels

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Common Types of Absorbent Pads		Best Applications / Benefits
White 	<ul style="list-style-type: none"> • For hydrocarbons (e.g. oils, gas, diesel) • Hydrophobic (will not soak-up water) • Floats (best option for hydrocarbon spills to water) 	
Grey 	<ul style="list-style-type: none"> • Universal use (e.g. for water-based products, glycols (antifreeze), hydrocarbons, chemicals) • Will absorb water (not best option for spills to water) 	
Yellow / Green 	<ul style="list-style-type: none"> • Best for hazardous & aggressive liquid chemicals (e.g. battery acid) • Will serve as a Universal pad (note it will absorb water) 	

Each spill kit will also contain a laminated copy of FRPD’s most recent version of the Emergency Spill Action Procedure (ESAP); the most current version of the ESAP can be located on the SharePoint site.

Spill Kits are to be readily accessible prior to the start of works (i.e. on the main deck for marine derricks) and shall not have any objects stored on the lids.

Used contents of each spill kit are to be immediately replaced following an environmental incident (e.g. spill/release). Banded (i.e. intact straps completely around the outside of the container) spill kits can be assumed to be fully stocked. Spill kit contents with broken / missing bands / straps shall be inspected / assessed on a periodic basis and documented on the ‘Record of HSEQ Site Visit’ form, or ‘Jobsite Safety Inspections’ form.

4.4 GENERAL SPILL RESPONSE

The FRPD Emergency Spill Action Procedure (ESAP) has been developed to identify the steps to take in the event of a spill. The ESAP will be posted aboard the marine derrick(s), posted at fuel storage/transfer locations and placed in all Emergency Spill Kits. The ESAP outlines the requirements to: evaluate hazards; stop product flow; contain the spill; notify / report; clean-up; and follow-up.

The most current version of the ESAP can be located on the SharePoint site.

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4.4.1 DISCOVERY AND RESPONSE

Spill/leak discovery and response are the responsibilities of all personnel on site. If a spill/leak of any size is noticed, the person who discovered the spill is responsible for notifying the Supervisor immediately. The person who initially identified the spill will also immediately try to stop the source if it is safe to do so. If the Supervisor is absent from the site, an alternate must be designated in advance to perform that function.

The Supervisor will immediately notify the Regulatory Compliance & Environmental Manager (RCEM); together, they will determine the appropriate methods for spill control and whether assistance (i.e. third-party response team) may be required to respond to the incident. The Supervisor is responsible for directing the crews. Isolating the spill material immediately will help minimize the extent of site contamination.

The Supervisor will assess the spill and record the material released, estimated volume, description of the impacted area, potential hazards to people and/or the environment and the containment/clean-up methods utilized. Appropriate notifications will be made by the Supervisor and/or the RCEM.

The Supervisor will ensure that spill kits and other spill containment materials are restocked and readily available for future use.

4.4.2 RESPONDING TO HYDROCARBON SPILLS ON LAND OR INSIDE BUILDINGS

- Stop, isolate and contain the spill to the greatest extent feasible.
- Leaks and spills will be cleaned up immediately.
- Dry clean-up methods (e.g. absorbent granular material (kitty litter), booms/socks, pads) are to be used for spills on ‘hard surfaces’ (e.g. pavement, concrete).
- Rags, absorbent pads and/or granular absorbent material can be used for small spills; a combination of absorbent materials may be required for larger spills.
- Dirt/soil can be used to create berms around the spilled material if there’s a chance that it may spread; dirt/soil can also be shovelled on top of the spill if a spill kit is not readily available. Isolating the spill will keep it from entering drains and/or watercourses and help minimize the extent of clean-up required.
- Clean-up materials will be stored in an open top drum and the drum will be sealed and labelled for subsequent storage and disposal.

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4.4.3 RESPONDING TO HYDROCARBON SPILLS INTO WATER

- Spills on water will be contained by immediately deploying boom(s) to create a perimeter and limit the area of the spill. The effectiveness of this action can be limited by winds, waves and other factors.
- Absorbent pads and similar materials will be used to capture small spills on water.
- Absorbent booms will be drawn slowly in to encircle spilled fuel/oil and absorb it. These materials are hydrophobic (absorb hydrocarbons and repel water). Absorbent booms are often relied on to recover any hydrocarbons that escape containment booms.
- Boards will be placed across drainage ditches in the event of a fuel spill. By staking the board into place and surrounding it with absorbent material, fuel on the surface of the water will be captured, while drainage will still be permitted to flow.

4.4.4 RESPONSE ASSISTANCE

FRPD will contact Tervita (or similar) for emergency response efforts associated with land-based spills (as required) and Western Canada Marine Response Corporation for emergency response efforts associated with marine-based spills (as required); consult the Emergency Spill Action Procedure (ESAP; available on the SharePoint site) for contact information.

4.4.5 DISPOSAL OF RESIDUAL LIQUIDS/SOLIDS AND CLEAN-UP MATERIALS

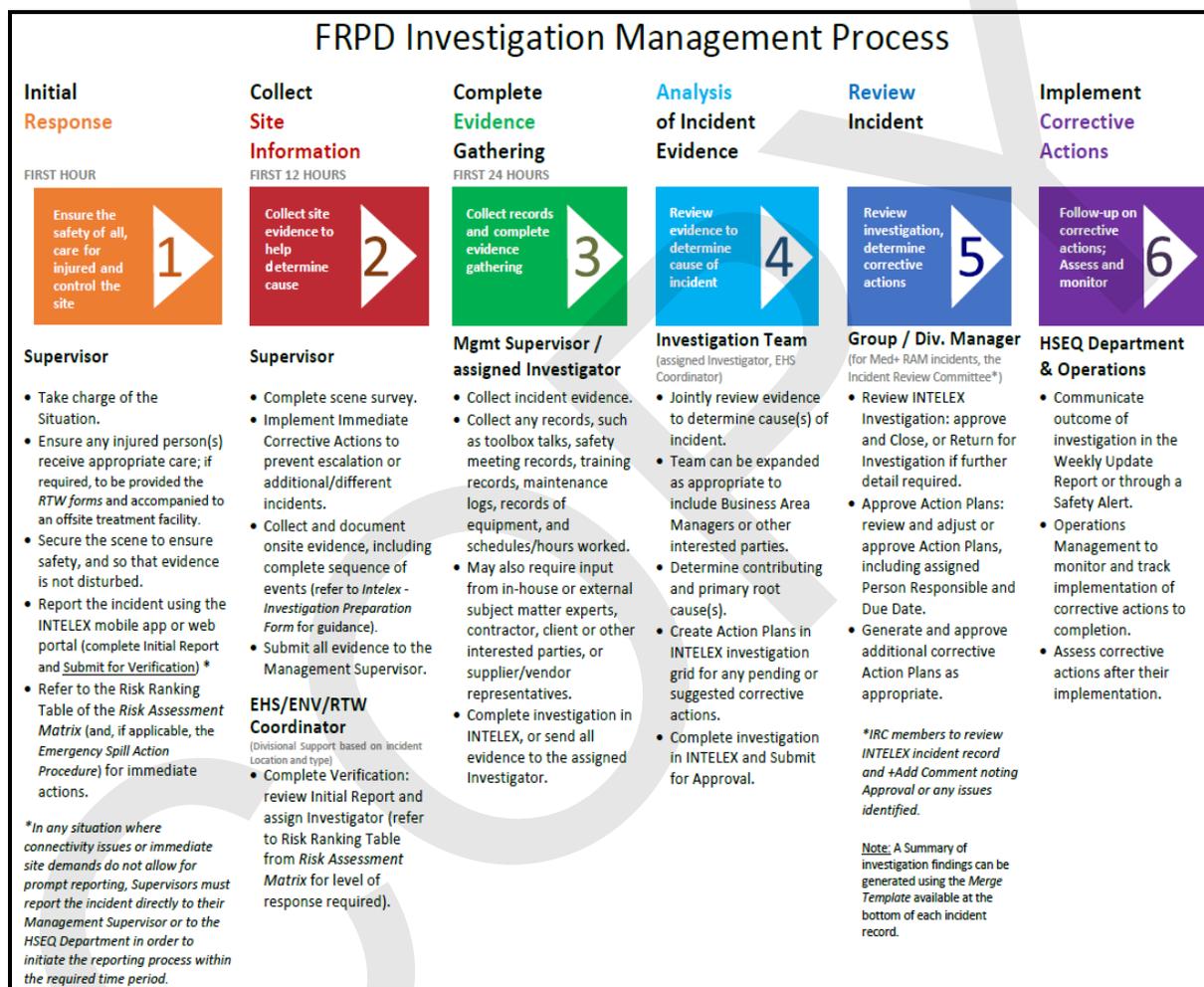
Once the spilled material and contaminated soil/water is removed offsite, the disposal is governed under the *Waste Management Act*. This aspect of the project is the responsibility of the Project Manager (with assistance from the RCEM). The majority of waste items from spills are collected in heavy polyethylene bags, sealed and transported to FRPD’s yard for temporary storage prior to disposal. The disposal site must be registered for the specific waste materials before disposal can proceed. Depending on the volume of waste, a licensed carrier may be needed to transport it to the approved facility.

4.5 INTERNAL REPORTING AND RECORD KEEPING

Environmental incidents (e.g. permit violation, spill) are treated in the same manner as all incidents at FRPD. Incident investigation, regardless of the type of incident, is a process involving a person or persons, which identifies the causal or contributory factors of incidents, analyses of the organization’s systems and establishes where system failures have occurred. The process enables the identification of changes in those systems necessary to prevent recurrences of similar incidents.

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The Incident Management Process is therefore the process of limiting the potential disruption caused by such an event, identifying the root causes of the accident/incident, and recommending corrective action to prevent the event from happening again. There are six stages of FRPD’s Investigation Management Process:



4.6 EXTERNAL REPORTING

The reporting of environmental incidents in British Columbia, including spills, is mandated by such regulations such as the provincial Spill Reporting Regulation of the *Environmental Management Act*, the *Fisheries Act* and the *Marine Liability Act*. The FRPD Supervisor is to be immediately notified of any event that has and/or could potentially result in adverse safety or environmental effect (e.g. accident on site, fuel or oil spill on land or in water, cement spill,

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machinery failure or sedimentation into a watercourse). The supervisor will notify the RCEM (or alternative) and the agreed-upon mitigation action(s) will be implemented.

The RCEM (or alternative) will conduct any of the required notifications to external agencies, as per the Emergency Spill Reporting flowchart included on FRPD’s Emergency Spill Action Procedure.

The following spills are to be reported to Environmental Management British Columbia (1-800-663-3456):

- the spill enters, or is likely to enter a body of water; and/or
- the quantity of the substance spilled is, or is likely to be, equal to or greater than the listed quantity for the listed substance provided in the Table 1.

Table 1: Spill Reporting Requirements - Reportable Spills on Land, as per the Spill Reporting Regulation of the *Environmental Management Act*.

Item	Substance spilled	Specified amount
1	Class 1, Explosives as defined in section 2.9 of the Federal Regulations	Any quantity that could pose a danger to public safety or 50 kg
2	Class 2.1, Flammable Gases, other than natural gas, as defined in section 2.14 (a) of the Federal Regs	10 kg
3	Class 2.2 Non-Flammable and Non-Toxic Gases as defined in section 2.14 (b) of the Federal Regs	10 kg
4	Class 2.3, Toxic Gases as defined in section 2.14 (c) of the Federal Regs	5 kg
5	Class 3, Flammable Liquids as defined in section 2.18 of the Federal Regs	100 L
6	Class 4, Flammable Solids as defined in section 2.20 of the Federal Regs	25 kg
7	Class 5.1, Oxidizing Substances as defined in section 2.24 (a) of the Federal Regs	50 kg or 50 L
8	Class 5.2, Organic Peroxides as defined in section 2.24 (b) of the Federal Regs	1 kg or 1 L
9	Class 6.1, Toxic Substances as defined in section 2.27 (a) of the Federal Regs	5 kg or 5 L
10	Class 6.2, Infectious Substances as defined in section 2.27 (b) of the Federal Regs	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 Regs	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"
12	Class 8, Corrosives as defined in section 2.40 of the Federal Regs	5 kg or 5 L
13	Class 9, Miscellaneous Products, Substances or Organisms as defined in section 2.43 of the Federal Regs	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 hydrocarbons as defined in section 1 of the hazardous Waste Regulation	5 kg or 5 L
17	waste asbestos as defined in section 1 of the Hazardous Waste Regulation	50 kg
18	waste oil as defined in section 1 of the Hazardous Waste Regulation	100 L
19	waste containing a pest control product as defined in section 1 of the Hazardous Waste Regulation	5 kg or 5 L
20	PCB Wastes as defined in section 1 of the Hazardous Waste Regulation	25 kg or 25 L
21	waste containing tetrachloroethylene as defined in section 1 of the Hazardous Waste Regulation	50 kg or 50 L
22	biomedical waste as defined in section 1 of the Hazardous Waste Regulation	1 kg or 1 L, or less if the waste poses a danger to public safety or the environment
23	A hazardous waste as defined in section 1 of the Hazardous Waste Regulation and not covered under items 1 – 22	25 kg or 25 L
24	A substance, not covered by items 1 to 23, that can cause pollution	200 kg or 200 L
25	Natural gas	10 kg, if there is a breakage in a pipeline or fitting operated above 100 psi that results in a sudden and uncontrolled release of natural gas

A summary of common products / wastes at FRPD and the reporting thresholds (i.e. from the Spill Reporting Regulation of the *Environmental Management Act* are included in Table 2.

Table 2: List of externally reportable quantities for commonly used substances at FRPD	
Class 2.1 - flammable gas (e.g. propane)	10 kilograms
Class 2.2 - non-flammable gas (e.g. CO ₂)	10 kilograms
Class 3 - flammable liquids (e.g. gasoline)	100 litres
Class 7 - radioactive materials	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)
Class 8 - corrosive liquid acids and caustics (e.g., battery acid)	5 kilograms or litres
Class 9 - miscellaneous dangerous goods (e.g. friable asbestos)	1 kilogram or litre
Oil & Waste Oil (less than 2ppm PCBs) 100 L	100 litres
Leachable toxic waste (e.g. abrasive blasting material, used antifreeze)	25 kilograms or litres
Pesticides and herbicides	5 kilograms or litres
Other substances (e.g. new antifreeze, power-wash water)	200 kilograms or litres

The Provincial Spill Reporting Regulation identifies three reports that responsible persons¹ must make:

- Initial Report;
- Update to the Minister Report; and

¹ A responsible person has possession, charge, or control of a substance or thing when a spill of the substance or thing occurs or is at imminent risk of occurring

- End-of-Spill Report.

Responsible persons may also be required to make a fourth report, a Lessons-Learned Report, if ordered to do so by a director.

Initial Report

This initial report must be made immediately to Emergency Management British Columbia (1-800-663-3456). Incident content / details for the initial report may include the information provided in Table 3.

Table 3: Summary of Reportable Information Requirements	
Report Information	Description
• Contact information of the individual making the report	First and last name, phone number and email address
• Contact information of the responsible person	First and last name, phone number and email address
• Location, date and time of the spill	First and last name, phone number and email address
• Location, date and time of the spill	Provide as much location specific information as possible (including: general directions, description of how to approach the area, latitude and longitude if available, street address, and the date and time in 24-hour clock format)
• Description of the spill site and surrounding area	Provide a description of the receiving environment of the spilled material (for example, the area is wooded and the ground is soft; there are sensitive riparian areas that are at risk of contamination)
• A description of the source of the spill	The container from which the material spilled (e.g. diesel fuel storage tank)
• Type and quantity of the substance spilled	An estimate of the amount of product spilled and a description of the product type, including product name, UN number, and Safety Data Sheet [SDS] (for example, diesel, UN 1202, 50 liters). If unknown, a description of the spill (for example, sheen or slick approximately 20 meters by 20 meters)
• Cause and impact of the spill	The circumstances leading to the spill; the immediate cause as well as any contributing factors.
• Details of the actions taken or proposed	Provide any necessary/ helpful details of the actions taken or planned (for example, what steps have been taken to contain the spill, which responders have been deployed, and when they will be on scene)
• The details of further action contemplated or required	Provide any necessary/ helpful details regarding next steps, including response actions, deployment of additional resources, and monitoring activities
• The names of agencies on scene	Any persons, government, federal government, local government, or Indigenous agencies
• The names of other persons or agencies advised concerning the spill	Any persons, government, federal government, local government, or Indigenous agencies

Update to the Minister Report

Responsible persons must provide an Update to Minister Report if:

- it is requested by the minister;
- conditions change from what was previously reported; or
- every 30 days after the date that the spill began until such time that an End-of-Spill Report is to be made.

End-of-Spill Report

Responsible persons must submit a written report to the ministry within 30 days following the emergency response completion date of a spill.

Duty to Notify the Department of Fisheries and Oceans

Fisheries and Oceans Canada would be notified in the event that a spill has and/or is likely to kill fish and/or result in the harmful alteration, disruption, or destruction (HADD) of fish habitat; notification would be made via the DFO-Pacific Observe, Record and Report phone line at 1-866-845-6776.

In addition, any release, or threat of a release from marine-based equipment to water is to be reported to the Canadian Coast Guard (1-800-889-8852).

4.6 TRAINING

FRPD Project employees receive the general awareness training as part of their orientation. In addition to the orientation, employees will receive ongoing on-the-job training for specific tasks (as required) from existing resources as applicable (e.g. safe-work practices, environmental guidelines, experienced site supervisors, environmental monitor, etc.). For those tasks / situations that do not have existing training aids available, then the Project Manager and/or HSEW Manager will assign appropriate resources to address these deficiencies; additional resources may include development of additional environmental guidelines, on-the-job training and/or third-party training.

In addition, senior management (and other employees as required) periodically participate in emergency response training exercises that may include spill response as a component.

Document Name	Spill Prevention and Response	Document Number	[HSE-ENV-CMP-PRO-0004]	Version	[1]	
Document Owner	Fraser River Pile & Dredge (GP) Inc.	Group	[HSEQ]	Effective Date	[2019-03-25]	
Printed Date	[2019-03-25]	Documents are uncontrolled once printed or downloaded			Page	13 of 14

5. DEFINITIONS

Please refer to the IMS Manual for definitions.

6. REFERENCES AND RELATED DOCUMENTS

	Name	Location
Legal and Other Requirements	HSE-ENV-CMP-PRO-0001 Environmental Regulatory Review	SharePoint
HSEQ Management System	FRPD Integrated Management Manual	SharePoint
Communication / Training	2.11. HSM-COP 08 Training and Communications	SharePoint

ATTACHMENT C:

Emergency Spill Action Procedure

COPY

EMERGENCY SPILL ACTION PROCEDURE (ESAP)

****This ESAP is to be posted at/on all FRPD Spill Kits, Project Sites, Derricks and Vessels****

Evaluate Hazards / Ensure Safety

- Never rush in; identify the material spilled prior to taking action and refer to the Safety Data Sheet (SDS)
- Ensure personal / public Health & Safety
- Determine appropriate Personal Protective Equipment requirements (refer to the SDS)
- Notify fellow workers / people in the immediate vicinity
- Eliminate sources of ignition (i.e. refer to the SDS to determine if material is flammable)
- Consider location, access, adjacent waterbodies, stormsewer inlets, weather, tides, etc.

Stop the Flow

- Stop or control the source of spill whenever possible and it is safe to do so
- Close valves, shut-off pumps, activate emergency shut-offs, plug holes / leaks, set containers upright
- Act quickly to minimize the potential for environmental impacts

Contain the Spill

- Each FRPD jobsite / operating area has a Spill Kit stocked with spill containment / clean-up supplies
- Contain the spill as close to the source as possible (e.g. use berms, absorbent booms / socks, soil, etc.)
- Prevent spilled material from migrating to waterbodies, ditches, drains, etc. (e.g. block-off / cover drains, culverts, etc.); if spill reaches water, use booms to encircle the material in as small an area as possible to minimize the impacted surface area
- Make every effort to minimize the spilled material from spreading to other areas (e.g. use berms, booms, create dike out of soil)

Notify / Report

- As soon as it's safe to do so, follow the emergency spill reporting flow chart on the following page and the Project Supervisor shall file an *Incident Report* using the **Intelex Online Incident Reporting System**.
- The contacted individual will notify external agencies (as required) and contact / request assistance from the spill response service (as required)

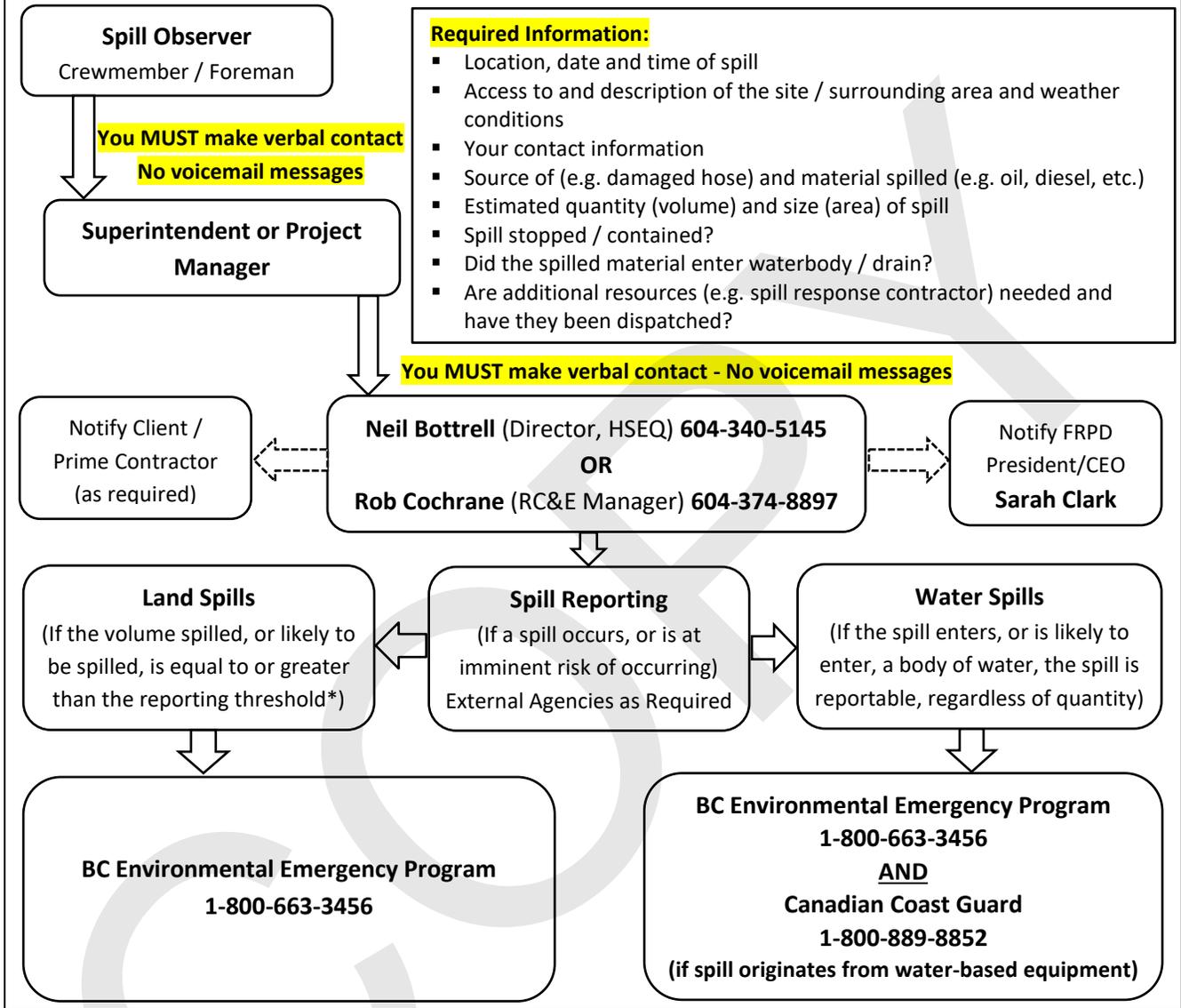
Clean-Up

- Utilize the FRPD Spill Kit contents to contain and clean-up spilled material(s) and place the contaminated materials in heavy-duty plastic bags, barrels and / or the Spill Kit container
- Additional clean-up materials are available from the Yard and/or the spill response service provider

Follow-Up

- All waste / clean-up materials must be stored in appropriate containers and removed from the jobsite under the direction of supervisory staff and in accordance with applicable regulations
- Immediately order / restock spill response supplies (**contact the Yard Coordinator at 604-528-9348**)
- Provide supporting documentation (e.g. photos) to complete required Intelex Incident Investigation fields

Emergency Spill Reporting for British Columbia Based Projects



- Required Information:**
- Location, date and time of spill
 - Access to and description of the site / surrounding area and weather conditions
 - Your contact information
 - Source of (e.g. damaged hose) and material spilled (e.g. oil, diesel, etc.)
 - Estimated quantity (volume) and size (area) of spill
 - Spill stopped / contained?
 - Did the spilled material enter waterbody / drain?
 - Are additional resources (e.g. spill response contractor) needed and have they been dispatched?

FRPD Alternative Contacts if HSEQ and RC&E Managers are Unavailable

Contact	Title	Cell
Tino Isola	Vice President Dredging & Survey	604-290-3190
Craig Longmuir	Vice President, Construction	604-258-8377
Mike Scott	Vice President, Major Projects	604-202-5457

Technical / Response Assistance (as Required)

Marine Response	Western Canada Marine Response Corporation	1-855-294-9116 (24 hours)
Land Response	Tervita / Secure Energy Inc.	1-800-327-7455 (24 hours)

* 'reporting threshold' refers to the Schedule of the BC Spill Reporting Regulation
https://www.bclaws.ca/civix/document/id/complete/statreg/187_2017#Schedule