

# Trans Mountain Expansion Project – Westridge Marine Terminal (WMT) Compliance Verification Activity Report

Date	Octo	ber 29, 2020	Site visit start time:	11:00 AM	Site visit end time:	4:00 PM		
Format	In-pe	rson site inspect						
Fisheries and Oceans		Biologist)						
Canada (DFO) attendees								
Indigenous Advisory	J.L. (	I.L. (Indigenous Monitor, Seabird Island Band) and T.M. (Indigenous Monitor,						
Monitoring Committee (IAMC) attendees	Seve	n Generations E	nvironmental S	ervices)				
Other attendees	Trans	Trans Mountain: S.D. (Lead Environmental Inspector) and K.M. (Senior						
	Regulatory Advisor)							
On-site contractor/equipment Role								
Trans Mountain Corporation	า	Site Management						
(TMC)								
Kiewit Ledcor Trans Mounta	ain	Prime construction contractor						
Partnership (KLTP)								
JASCO Applied Sciences		Underwater noise monitoring during vibratory and impact pile driving.						
Triton Environmental Consultants		Fish salvage in foreshore Cells and Arcs and marine mammal monitoring.						
Keller		Deep soil mixing (DSM) and jet grouting works on the foreshore.						
DB Columbia	Derrick barge (DB) Columbia is moored along the shoreline while vibratory pile driving sheet-piles for foreshore Arc 10A.							
DB General		DB General is moored along the shoreline for vibratory and impact pile						
	driving of Trestle Span 1 (TS1). TMC is using seal acoustic deterrent							
		devices during impact pile driving.						
DB Bremerton		Located offshore awaiting works on Mooring Dolphin 2 piles.						
DB Patrick		DB Patrick is c		offshore and	is used to prim	arily drive		
IAMC Indigenous Monitor		smaller diameter piles.						

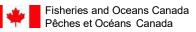
#### IAMC Indigenous Monitor Observations and Comments

JL's General Notes:

- Number of seal sightings are decreasing and California sea lion has not been spotted in recent days
- Currently using 4 seal acoustic deterrents effectiveness varies because of unpredictable seal volume and activity
- 'Seal stops' have been ordered to be installed on safety boom, floats, docks etc.
- Secondary bubble curtain test complete waiting on results from JASCO report
- TMC has specific teams to monitor, maintain and adjust erosion and sediment control (ESC) measures at the WMT
- Trans Mountain IM away day of inspection due to emergency surgery (non-work related)

JL's Observations:

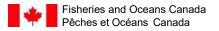
- Observed ongoing works of building derailment wall
- Observed ongoing pre drilling, deep soil mixing and jet grouting activity on foreshore
   o Areas fenced / safety signs posted
- Observed sediment fence and pumps around grout production area
- Observed water treatment plant



- o All foreshore contact water treated before discharging back to marine environment
- Permit amendment in process for treating waste water
- Observed and informed of various recent fish salvage activities
  - o Observed salvage equipment within Arc 3A
  - Cells 4 and 5 and Arc 3A salvage complete
  - Arc 10A invertebrate salvage underway
  - All salvaged marine life transported to Barnet Marine Park via water taxi
- Observed turbidity curtain around length of foreshore
  - Noticeable difference in colour of the water inside and outside of the curtain
- Observed conveyer barge backfilling Cell 4
  - Template set for Arc 5A
  - Once Arc 4A and Arc 5A are complete scaffolding will be removed and area will be backfilled
- Observed vibratory pile driving of sheet piles for Arc 10A
  - Sheets are vibed in simultaneously to prevent kick back
- Observed cured grout spoils being loaded into hopper and onto double conveyor into containment barge
  - Heavy duty tarps catch fallen grout within 2 meter gap from sheet piles to grout collecting on the barge
  - Operational for roughly 2 weeks prior to inspection
  - Conveyor gated off and warning/safety signs posted
- Observed jet grouting spoil pits
  - Jet grouting test pit in Cell 8
  - Areas gated with safety/warning signs posted
- Observed multiple spill kits around ongoing works on foreshore
- Observed plant nappies under equipment and parked vehicles on foreshore
- Observed preparations for temporary relocation of jet fuel line in order to build Cell 11
- Observed single boot brush on grated bridge to marine construction office
  - Inquired if its usage was mandatory to prevent grout from boots falling into marine environment was ensured its usage is best practice
- Observed DB General resetting in attempt to impact pile through large obstruction
  - Resetting was unsuccessful on this day
  - No impact pile driving observed
- Observed first completed top deck pour on Loading Platform 1 offshore
  - All pre-cast deck panels are set
  - Rebar installation ongoing
  - Next concrete pour scheduled for beginning of November
  - o Hazardous materials stored in drums inside secondary containment

### JL's Follow-up questions:

- KJ relayed JL's follow-up questions to TMC during the November 26<sup>th</sup> CVA conference call:
  - Have the test results regarding the secondary bubble curtain been analyzed by JASCO yet and will these results be shared with the IAMC and DFO?
  - SD: TMC has received the draft report from JASCO on the secondary bubble curtain test today. TMC will review and finalized the report soon.
  - When on-site last month, SD mentioned a team of people who are involved in erosion and sediment control (ESC) measures. Are you able to elaborate on what this team does?
  - SD: The TMC team includes SD, MJ and another Environmental Inspector. This team monitors all ESC measures, identifies deficiencies and makes recommendations for improvements. KLTP has an environmental team and completes similar tasks as the TMC



team. A third ESC team includes a super intendent, a foreman and labourers who implement, maintain and adjust ESC measures.

### TM's Notes and Observations:

1100hrs – Arrive at KASK with KJ and JL.

Meet with TMC representatives (Jake - KLTP safety coordinator, SD and KM). Completed project visitor orientation.

TMC summarized current activities.

1230hrs- Arrive Westridge Marine Terminal Site

Observed activity while walking the length of the shoreline – jet grouting, loading of conveyor barge, pile driving.

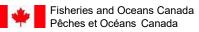
Observed turbidity current at West end of shore en route to water taxi – appeared effective. 1330hrs - Toured site by water taxi.

Boarded DB Olympia barge and observed rebar installation activities on Loading Platform 1/2. 1500hrs – Returned to shore and conducted debrief with SD, KM, JL and KJ.

1540hrs – Debrief with KJ and JL at KASK site. Mentioned that I observed some workers on DB Olympia barge not wearing PFD's in some areas and some were not wearing masks when less than 6 feet away from each other. Discussed possibility of grout coming off our boots and falling into the water while walking on the metal grating around the marine construction office and walkway to the water taxi. 1600hrs – Left KASK.

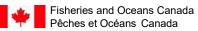
Note: Pictures taken. I reviewed KJ's draft report below and support its content.

Time	Inspection Activity					
11:00 AM	Upon arrival at the KASK site, a KLTP representative gave JL, TM and KJ a Health and Safety Orientation.					
	<ul> <li>Prior to going out on site SD, KM, TM, JL and KJ had a pre-site meeting. SD provided an overview of the site layout at the WMT and described the construction works that have occurred since the September 28<sup>th</sup> compliance verification site visit:</li> <li>Foreshore (ongoing deep soil mixing and jet grouting and works on the derailment wall);</li> </ul>					
	<ul> <li>Nearshore/in-water (completed fish salvages in foreshore Cells 4, 5 and Arc 3A, backfilling Cell 4, installing a template for Arc 5A, and conducting an invertebrate salvage and vibratory pile driving sheet-piles for Arc 10A);</li> <li>Offshore (in the process of conducting top deck concrete pours on Loading Platform 1/2, welding and installing formwork on Junction Platform 1 and vibratory and impact pile driving Trestle Span 1 (TS1) piles).</li> </ul>					
	Other items discussed:					
	<ul> <li>SealFence seal acoustic deterrent system:         <ul> <li>SD confirmed that the sound source characterization report produced by JASCO should be ready soon and will be shared with DFO and the IAMC.</li> <li>Mixed results were produced while using four seal acoustic deterrents when previously impacting TS0. SD explained the deterrents are not 100 % effective at deterring harbour seals within the 150 m harbour seal-specific exclusion zone.</li> </ul> </li> </ul>					
	<ul> <li>SD confirmed the seal acoustic deterrents are run prior to and during impacting for a duration of approximately 30 minutes to 1 hour. Marine mammal monitors are present prior to and during operation of the devices to perform continuous visual monitoring of a 1,400 m exclusion zone for cetaceans and marine mammal species at risk.</li> <li>SD confirmed TMC will limit the duration of the acoustic deterrents as much as possible in order to avoid habituation.</li> </ul>					
	<ul> <li>California sea lion using the marine construction safety boom as a haul-out site:         <ul> <li>SD confirmed the sea lion is no longer present at the WMT.</li> <li>Impact pile driving was completed while the sea lion was on-site, but out of the water. A marine mammal monitor continuously monitored the sea lion during impact pile driving and work was stopped as soon as the sea lion entered the water.</li> </ul> </li> </ul>					
	$\circ$ SD has ordered 'seal stops' that are designed to help deter seals and seal					
	lions from hauling out on floats or docks.					
	<ul> <li>Secondary bubble curtain:         <ul> <li>Testing for the secondary bubble curtain is complete and JASCO is in the process of analyzing results.</li> </ul> </li> </ul>					
	<ul> <li>The secondary bubble curtain may be used to attenuate underwater noise if hard substrate is encountered while impact pile driving.</li> </ul>					
12:30	Arrive at the Westridge Marine Terminal.					
12:30 – 13:30	<ul> <li>Works observed while walking along the foreshore:</li> <li>Observed the wastewater treatment plant located on the western foreshore (the treatment plant will be moved once deep soil mixing and jet grouting works</li> </ul>					
	commence on the western foreshore). All surface water run-off from the foreshore					

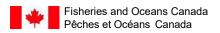


## Monitoring Report: SV-2020-10-29

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	and above is redirected here via hoses and pumps for treatment prior to being discharged into the marine environment.
	<ul> <li>Sampling is conducted inside and outside of the foreshore turbidity curtain to ensure pH and turbidity levels meet the requirements of TMC's BC</li> </ul>
	Ministry of Environment (MOE) discharge permit.
	<ul> <li>Viewed the conveyor barge backfilling foreshore Cell 4 with gravel.</li> </ul>
	<ul> <li>Turbidity from backfilling was primarily contained within the gap between the southernmost foreshore sheet piles and the foreshore. The sheet-piles</li> </ul>
	composing the foreshore cells are not water-tight. The turbidity curtain surrounding the foreshore cells functions as a barrier between the outside
	<ul> <li>or northernmost foreshore sheet-piles and the marine environment.</li> <li>Turbidity sampling is conducted inside and outside the turbidity curtain</li> </ul>
	during backfilling.
	<ul> <li>The fish salvage in adjacent foreshore Arc 3A was completed prior to backfilling Cell 4. An exclusion net was visible between Cell 4 and Arc 5A.</li> </ul>
	<ul> <li>Viewed the wastewater containment pit for grout works and appropriate erosion</li> </ul>
	and sediment controls (ESC) surrounding the pit (silt fencing and a small trench
	with built up sides). SD ensured the silt fencing was keyed in properly. The silt fencing appeared to be maintained. TMC is waiting to receive a permit from the BC
	MOE to treat this wastewater on-site at the foreshore wastewater treatment plant.
	Observed a few remaining creosote piles from Dock 59.
	<ul> <li>SD confirmed the piles are wrapped with sorbent pads to prevent leaching of hydrocarbons.</li> </ul>
	• Observed the conveyor system transporting cured grout spoils from the foreshore to the moored barge. The contractor, KLTP, has fitted a metal frame lined with a thick tarp beneath the section of the belt (approximately 2 m in length) that extends over the marine environment, to prevent any grout or residue from entering the water below. The barge takes the cured offsite for disposal at Summit Earthworks in Mission, BC.
	<ul> <li>Observed plant nappies present beneath trucks and equipment parked on the foreshore.</li> </ul>
	<ul> <li>Observed ongoing DSM and jet grouting works and the grout spoil pits.</li> </ul>
	<ul> <li>Observed a 'test' grout pit on the foreshore.</li> </ul>
	<ul> <li>Jet grout columns need to be installed closer to the foreshore sheet-pile</li> </ul>
	walls that form a barrier between the marine environment and the foreshore.
	<ul> <li>The test pit, located on the foreshore away from the marine environment, includes part of one the foreshore cells that has been previously backfilled</li> </ul>
	with piles cut to ground level.
	<ul> <li>As sheet-piles composing the foreshore cells are not water-tight, TMC is</li> </ul>
	testing jet grouting works next to the sheet piles to see if the pressure
	forces any liquid or material outside the sheet-pile walls.
	<ul> <li>Observed vibratory pile driving sheet-piles for Arc 10A.</li> <li>After the site visit, DFO asked TMC for clarification of the timing of vibratory</li> </ul>
	pile driving and the fish/invertebrate salvage behind the Arc.
	<ul> <li>TMC confirmed the contractor, KLTP, closed the sheet-pile wall of Arc 10A during low tide when there was no water or fish behind the Arc. TMC's fish salvage contractor, Triton Environmental Consultants, completed the invertebrate active at level tide by head over these down (Ortebra 27.20)</li> </ul>
	invertebrate salvage at low tide by hand over three days (October 27-29).



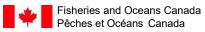
	<ul> <li>Observed the turbidity curtain that encompasses the foreshore cells to be working well (the curtain was keeping the more turbid water from entering the adjacent marine environment).</li> </ul>
13:30 - 14:30	Works observed while on the water taxi offshore:
10.00 - 14.00	Viewed works on Loading Platform 1/2
	• All pre-cast deck panels are set, rebar is being installed, and large top-deck
	pours are in progress (next pour on November 3).
	<ul> <li>Spill containment bins were located on the barge next to the Loading Platform.</li> </ul>
	<ul> <li>KJ asked how the concrete and grout pours were going offshore.</li> </ul>
	• SD confirmed no pours were occurring today and pours are going well with
	proper mitigation measures in place.
	• Viewed trestle spans between the Loading Platform and the Junction Platform.
	• Observed a TS1 pile being driven with the tandem APE-600 vibratory hammer.
	<ul> <li>No impact pile driving was observed as the pile was hitting an obstruction</li> </ul>
	and could not be driven any further during the site visit.
	<ul> <li>Once TS0-TS2 piles are driven, the trestle span will eventually connect</li> </ul>
	from the shore to Loading Platform 1/2.
	<ul> <li>Mooring dolphin 1 and 3 piles will be driven following completion of trestle</li> </ul>
	span piles.
15:00 - 15:20	Post-site inspection meeting:
	• KJ asked if the SealFence acoustic deterrents are run at the same time as the fish
	acoustic deterrents.
	<ul> <li>SD explained the acoustic deterrents do overlap during operation. SD</li> </ul>
	confirmed the acoustic deterrents operate on different frequencies.
	<ul> <li>JL asked where the jet grouting 'test' pit is located on the foreshore.</li> </ul>
	<ul> <li>SD confirmed it is located in foreshore Cell 8.</li> </ul>
15:20-15:40	Shuttle back to KASK site.
15:40 - 16:00	Post-site visit discussion between IAMC IM's and DFO:
	• JL raised the issue of sediment and mud from boots being potentially tracked onto
	and falling through the metal grating of the walkway surrounding the marine
	construction office into the marine environment below (especially after walking or
	working in the foreshore area).
	<ul> <li>After the site visit DFO reached out to TMC via email regrading this</li> </ul>
	concern. TMC confirmed that a boot brush near the marine construction
	office was available during the site visit. Following the feedback received
	during the site visit, TMC installed an additional boot cleaner by the
	entrance to the trestle deck and has added signage directing workers and
	guests to clean their boots prior to entering the trestle. Photos of the boot
	cleaning station and the signage were provided to DFO.
	<ul> <li>Discussed potential safety concerns on-site:</li> </ul>
	• TM noted that some of the workers working on the trestle span appeared to
	not be wearing Personal Flotation Devices and mask requirements may not
	have been appropriately followed by all (e.g. some workers at times
	appeared to be within six feet of each other, but were not wearing a face
	covering).
	• After the site visit, DFO informed the Canadian Energy Regulator (CER) of
	these observations via email, given the CER's regulatory oversight of
	health and safety and COVID-19 protocols at the WMT.



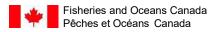
## **GENERAL AND MISCELLANEOUS MITIGATION MEASURES**

Measures specified within the Westridge Marine Terminal Fisheries Act Authorization Conditions:

Schedule						
	2.2.6 All nearshore in-water Project construction activities (within a 50-m horizontal distance seaward of the higher high					
water large tide level) at the Westridge Marine Terminal shall only be carried out during a work timing window from August 16 to March 15 each year.						
Discussed/ Xes	Issue(s)	□ Yes	Issue(s)		Not applicable 🗆	
observed: 🗆 No	identified:	⊠ No	unresolved:	□ No		
Comments						
Nearshore works were tak	ing place within	the work tim	ning window.			
Action Items						
None.						
Monitoring						
3.1 A qualified environmental activities, and shall monitor the standards and avoidance me impacts to fish and fish habita	e works, underta asures to avoid i	akings or activ	ities on a systema	atic and on-going	basis to ensure that	
Discussed/ ⊠ Yes observed: □ No	lssue(s) identified:	□ Yes ⊠ No	lssue(s) unresolved:	□ Yes □ No	Not applicable 🛛	
Comments			1			
TMC's EI was on-site at the during the site inspection. medical emergency unrela WMT within the next week	The TMC IM, re ted to works at	epresenting k	wikwetlem First	t Nation, was u	navailable due to a	
Action Items						
None.						
Marine Mammal Obser						
2.2.7 In-water construction ac area such that there is risk of the marine mammal has been	direct physical h	arm to the ma	rine mammal. Co	nstruction activit	ies may only resume once	
Discussed/ 🛛 Yes	lssue(s)	$\Box$ Yes	lssue(s)	□ Yes	Not applicable $\Box$	
observed: 🗌 No	identified:	⊠ No	unresolved:	🗆 No		
Comments						
TMC noted that there had been multiple delays to pile driving recently due to the presence of one or more harbour seals in the seal-specific 150 m exclusion zone prior to the commencement of impact pile driving.						
Work stoppage of impact p mammal 1 km exclusion zo WMT as a haul-out site for was located out of the wate required to continuously wa enter the water during impa- Action Items	one. The sea lic the past few w er on the marin atch the sea lio	on has been eeks. Impact e constructio n to ensure v	using the marine t pile driving was n safety boom.	e construction s s only conducte A marine mam	safety boom at the ed when the sea lion mal monitor was	



None.						
				of Existing Str		
				a floating debris b ty dock (page 3.1)		ired around the work area
Discussed:	□ Yes	lssue(s)	□ Yes	Issue(s)	□ Yes	Not applicable 🖂
	🛛 No	identified:	□ No	unresolved:	□ No	
		stalled below the struction purpose		ark shall be deco	mmissioned and	removed when they are
Discussed/	□ Yes	lssue(s)	□ Yes	lssue(s)	□ Yes	Not applicable 🖂
observed:	🛛 No	identified:	□ No	unresolved:	□ No	
Comments						
	are currently	being decomm	nissioned.			
Action Items						
None.						
Pump Intake						
Addendum, Fish Oceans Canada of Aquatic Orga	neries and Oc a 1995), and F	eans Canada's F isheries and Oc	Freshwater Inta eans Canada's	ake End-of-Pipe F	Fish Screen Guid Iinimizing Entraii	ations outlined in the <i>lelines</i> (Fisheries and <i>nment and Impingement</i> 091).
Discussed/	🗆 Yes	lssue(s)	🗆 Yes	lssue(s)	□ Yes	Not applicable 🖂
observed:	🖾 No	identified:	🗆 No	unresolved:	🗆 No	
Comments						
Screens for kn reported.	own water ir	ntakes have be	en discussed	during previous	s site inspectior	ns. No issues were
Action Items						
None.						
Fish Salvage						
2.2.3 Fish salva avoid and minim	ge and reloca nize adverse i	tion shall be con mpacts to fish.	ducted, as ap	propriate, prior to	the start of cons	truction activities so as to
Discussed/	🛛 Yes	lssue(s)	□ Yes	lssue(s)	$\Box$ Yes	Not applicable $\Box$
observed:	🗆 No	identified:	🖾 No	unresolved:	🗆 No	
Comments						
Fish salvages within Cell 4, 5 and Arc 3A have been completed since the last site visit on September 28, 2020. An invertebrate salvage was underway in Arc 10A on the day of the site visit. Fish salvages are conducted prior to impacting any sheet-piles. Minnow and crab traps are used. Captured fish and invertebrates are released at Barnet Marine park. No issues were reported.						
Action Items						
None.	labitat Off					
•	ent shall not o		s, undertakin)	s or activities tha	t will adversely c	listurb or impact the
offsetting measu						Not oppliachte M
Discussed/ observed:	□ Yes ⊠ No	lssue(s) identified:	□ Yes □ No	lssue(s) unresolved:	□ Yes □ No	Not applicable 🛛
Comments						
Offsetting mea	sures have	yet to be install	ed.			

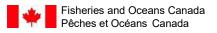


Action Items	
None.	

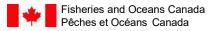
## MITIGATION MEASURES SPECIFIC TO PILE DRIVING

Measures specified within the Westridge Marine Terminal Fisheries Act Authorization Conditions:

Underwater	Sound Pre	ssure Level	Reduction			
						ater pile driving activities
						se impacts to fish.
Discussed/	⊠ Yes	Issue(s)	□ Yes	lssue(s)	□ Yes	Not applicable $\Box$
observed:	□ No	identified:	⊠ No	unresolved:	□ No	
2.2.9.1 To avoi exclusion, etc.)			sures (e.g., bu	bble curtain arou	nd the full wetted	length of the pile, fish
Discussed/	⊠ Yes	lssue(s)	□ Yes	lssue(s)	□ Yes	Not applicable 🗆
observed:	🗆 No	identified:	🛛 No	unresolved:	🗆 No	
Comments		1				
Tandem APE span piles pri from all pile d	-600 vibrator or to impactir riving activitie	y hammer redu ng. Hydrophone es.	ices time spe es are being u	nt impact pile dr ised to monitor	iving and is bei and record und	site inspection. The ng used to drive trestle erwater noise produced the impact pile driving
						terrent, strikes to the
				and lower strike		
Action Items		U				
None.						
Underwater	Sound Pre	ssure Level	Monitoring			
						n 10 meters of the pile threshold for injury to
Discussed/	⊠ Yes	lssue(s)	□ Yes	lssue(s)	□ Yes	Not applicable 🗆
observed:	🗆 No	identified:	🛛 No	unresolved:	🗆 No	
2.2.9.3. Outside of the least risk window for Burrard Inlet (August 16 – February 28), a more conservative underwater sound threshold of 22.5 kPa (207 dB re: 1 μPa) will be adhered to, and monitored, to prevent injury to finfish. If sound levels exceed this threshold, or a fish kill is observed despite mitigation measures being in place, pile driving activities are to cease immediately and mitigation methods are to be reviewed and modified in consultation with DFO.						
Discussed/	□ Yes	lssue(s)	□ Yes	lssue(s)	□ Yes	Not applicable 🖂
observed:	🛛 No	identified:	🗆 No	unresolved:	🗆 No	
2.2.9.4 If underwater noise recordings indicate that sound levels are likely to exceed the applicable threshold defined in conditions 2.2.9.2 or 2.2.9.3, the Proponent will take appropriate action with the goal of preventing the exceedance from occurring. These actions may include adjusting the force of the hammer, adjusting the mitigation measures already in place to increase their effectiveness, or implementing additional mitigation measures.						
Discussed/	🛛 Yes	lssue(s)	🗆 Yes	lssue(s)	🗆 Yes	Not applicable 🗌



observed:	□ No	identified:	⊠ No	unresolved:	□ No			
2.2.9.5 Upon c	ommencemen	t of pile driving, o		ement after a dela	ay of 30 minutes	or more, pile installation		
shall ramp-up by starting with less frequent impact strikes of lower force. This ramp-up period is designed to enable any								
fish that may be in the area time to leave the area prior to the generation of peak pressure and noise levels for pile								
installation.								
Discussed/	⊠ Yes	Issue(s)	□ Yes	Issue(s)	□ Yes	Not applicable 🗆		
observed:	🗆 No	identified:	⊠ No	unresolved:	□ No			
Comments	Comments							
						at during recent impact		
					µPa at 10 m fro	om the pile for trestle		
		2 dB re: 1 µPa	for mooring o	olphin piles.				
Action Items	5							
None.								
Marine Man								
						es or more, visual		
		a to determine if			lithin an exclusion	on zone of 1 km (except		
Discussed/	⊠ Yes	Issue(s)		lssue(s)	□ Yes	Not applicable 🗆		
observed:	□ No	identified:	⊠ No	unresolved:				
						heir respective exclusion		
zones for 30 m								
Discussed/	⊠ Yes	lssue(s)	□ Yes	Issue(s)	□ Yes	Not applicable 🗆		
observed:	□ No	identified:	⊠ No	unresolved:	□ No			
2.2.9.8 Exclusi		be monitored co		ring impact pile d		e mammal or marine		
						se until all marine		
		ive exclusion zor	ne or they have	e not been sighte	d for 30 minutes	within their respective		
exclusion zone								
Discussed/	⊠ Yes	Issue(s)	□ Yes	Issue(s)	□ Yes	Not applicable $\Box$		
observed:	🗆 No	identified:	🛛 No	unresolved:	🗆 No			
						1 km exclusion zone		
						dings demonstrate that		
exclusion zone		ceeded. Conditi	ons 2.2.9.6 to	2.2.9.8 Will need	to be complied v	vith within this new		
Discussed/	∕. ⊠ Yes	Issue(s)	□ Yes	Issue(s)		Not applicable 🗆		
observed:		identified:	$\square$ No	unresolved:	$\square$ No			
						onitoring of marina		
mammal exclu		be carried out o	iunng dayngni			onitoring of marine		
Discussed/	⊠ Yes	Issue(s)	□ Yes	lssue(s)	□ Yes	Not applicable		
observed:	□ No	identified:	⊠ No	unresolved:				
		luonanou.		diff coorred.				
Comments	d processo of	harbour agala	within the he	rhour and anon	fic 150 m ovel	ision zone prior to and		
				stoppages. TM				
deterrents within the 150 m seal-specific exclusion zone as a mitigation measure to avoid adverse impacts								
(e.g., auditory injury) to 'fish' (which includes marine mammals such as seal) during impact pile driving								
(Condition 2.2	2.8 of the Fisl	heries Act Auth	orization). Cι	urrently, prior to	and during ope	eration of the four seal		
(Condition 2.2) deterrents, fiv	2.8 of the <i>Fisl</i> /e marine ma	<i>heries Act</i> Auth mmal monitors	orization). Cu perform cont	urrently, prior to tinuous visual m	and during ope onitoring of a 1			



following the results of the sound characterization study conducted by JASCO for the seal acoustic deterrent devices.

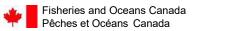
Recent work stoppages to impact pile driving were also due to the presence of a California sea lion within the marine mammal exclusion zone. The sea lion has been using the marine construction safety boom at the WMT as a haul-out site for the past few weeks. Impact pile driving was only conducted when the sea lion was located out of the water on the marine construction safety boom, and not exposed to underwater noise. A marine mammal monitor was required to continuously watch the sea lion to ensure works could be stopped if it looked like the animal was about to enter the water during impact pile driving. The sea lion had not been spotted by monitors for the last few days prior to the site visit.

Action Items

None.

### Measures specified within the Westridge Marine Terminal Environmental Protection Plan:

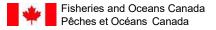
Fish Salvage					
35. Immediately following the installation of each sheet pile cell, and prior to excavation and infilling of that cell, conduct a salvage of commercial, recreational and Aboriginal (CRA) fishery species via crab and fish trapping/netting and seines (where appropriate). Release captured CRA fishery species in a suitable habitat at least 500 m away from marine construction activities.					
Discussed/ ⊠ Yes observed: □ No	lssue(s) □ Yes identified: ⊠ No	lssue(s) unresolved:	□ Yes □ No	Not applicable $\Box$	
Comments					
Fish salvages have been completed within Cells 4 and 5, and behind Arc 3A since the last site visit on September 28, 2020. An invertebrate salvage was underway in Arc 10A on the day of the site visit. Fish salvages are conducted prior to impacting any sheet-piles. Minnow and crab traps are used. Captured fish and invertebrates are released at Barnet Marine park. No issues were reported.					
Action Items					
None.					
Turbidity Monitoring					
43. Should visual monitoring during in-water pile installation indicate concern regarding turbidity levels, the Environmental Inspector will arrange for in situ sampling of turbidity (nephelometric turbidity units). Should turbidity levels exceed specified thresholds, pile driving will temporarily be halted.					
Discussed/ ⊠ Yes observed: □ No	lssue(s) □ Yes identified: ⊠ No	lssue(s) unresolved:	□ Yes □ No	Not applicable $\Box$	
Comments					
Vibratory pile driving was occurring on a TS1 pile and Arc 10A sheet-piles during the site inspection. No concerns were raised regarding turbidity levels. The water surrounding the TS1 pile being driven did not appear to be more turbid than surrounding offshore water. Potential turbidity generated from driving Arc 10A sheet-piles was not viewable during the site inspection; however, Arc 10A is encompassed by the foreshore turbidity curtain.					
TMC noted that water is sampled on an ad hoc basis (i.e., when turbidity is observed).					
Action Items					
None.					



## MITIGATION MEASURES SPECIFIC TO FORESHORE CONSTRUCTION

<b>Riparian Pla</b>	Riparian Planting and Material Handling					
Westridge N	larine Termi	nal Fisheries .	Act Authoriz	ation Conditio	ns	
2.2.4 Disturbed	d riparian areas	shall be replant	ted as appropr	iate, with native r	on-invasive spec	cies of vegetation.
Discussed/	🗆 Yes	lssue(s)	□ Yes	lssue(s)	🗆 Yes	Not applicable 🛛
observed:	🛛 No	identified:	🗆 No	unresolved:	🗆 No	
Westridge N	larine Termi	nal Environme	ental Protec	tion Plan Com	mitments	
30. Unless oth	erwise approve	ed by DFO, retai	n all excavated	l [marine] materia	al and dispose at	a land-based facility in
accordance wit	th applicable re	egulations.				
Discussed/	□ Yes	lssue(s)	□ Yes	lssue(s)	□ Yes	Not applicable 🛛
observed:	🛛 No	identified:	🗆 No	unresolved:	🗆 No	
Comments						
Not applicable.						
Action Items	Action Items					
None.						

Water Quality Ma	intenance and M	onitoring			
Westridge Marine	<b>Terminal Fisherie</b>	s Act Authoriz	ation Condition	ทร	
2.2.1 Effective sedime					
starting construction a			iction activities, as	s appropriate, to	avoid the deposit and
dispersion of sedimen		ronment.			
Discussed/ 🖂 Ye	( )	🗆 Yes	lssue(s)	🗆 Yes	Not applicable 🛛
observed: 🗆 N	o identified:	🛛 No	unresolved:	🗆 No	
2.2.10 A turbidity curta					
					During severe weather
					ity curtain (e.g., > 70 km/h
turbidity curtain or adv					t concentrations within the
Discussed/		$\Box$ Yes			Nat appliaabla M
			Issue(s)	□ Yes	Not applicable 🛛
observed: 🖂 N	o identified:	□ No	unresolved:	🗆 No	
Westridge Marine	Terminal Environ	mental Protec	tion Plan Com	mitments	
29. During in-water ex					
				ict WQM to asse	ss the effectiveness of
the turbidity curtain an					
Discussed/	( )	🗆 Yes	Issue(s)	□ Yes	Not applicable 🛛
observed: 🛛 🖂 N	o identified:	🗆 No	unresolved:	🗆 No	
Westridge Marine Terminal Sediment and Erosion Control Plan Commitments					
The in-water sediment curtain will remain intact during Foreshore construction activities to ensure sediment laden					
water is not discharged into Burrard inlet.					
Discussed/ 🖂 Ye	es Issue(s)	🗆 Yes	Issue(s)	□ Yes	Not applicable $\Box$
observed: 🗌 N	o identified:	⊠ No	unresolved:	🗆 No	
Comments			•		



A turbidity curtain remains in place around the sheet-pile cells and attaches to the foreshore. Visual monitoring indicated that the turbidity curtain was working to effectively separate the more turbid water generated from foreshore construction activities from the adjacent marine environment.

Another turbidity curtain is in place around a water outfall located on the westernmost foreshore area that drains water from residential storm grates and water from a treated wastewater containment tank at WMT.

Silt fencing surrounding the grout wastewater containment area on the foreshore appeared to be maintained (upright, intact and confirmed to be keyed in). Polysheeting lined the pit where the grout waste is contained.

Polysheeting is used to prevent erosion of the foreshore banks located behind foreshore cells in areas that have yet to be backfilled and have exposed earth (e.g. behind foreshore Cells 4, 5 and part of 6).

Berms built up around the grout curing pits on the foreshore appeared to easily contain the liquid grout spoils as they harden.

Action Items

None.

Additional comments or action items None.