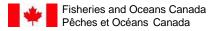
Trans Mountain Expansion Project – Westridge Marine Terminal Monitoring

In light of the current COVID-19 pandemic, Fisheries and Oceans Canada (DFO) and Musqueam Indian Band's (Musqueam's) Indigenous Advisory and Monitoring Committee Indigenous Monitor (IAMC IM) have not been conducting joint in-person monthly site inspections at the Westridge Marine Terminal (WMT), in Burrard Inlet, BC, since March 2020. Instead, DFO and several representatives from the IAMC (including the Musqueam IAMC IM) had two conference-call meetings per month with representatives from Trans Mountain Pipeline ULC (Trans Mountain), the Project Indigenous Monitor (Project IM) from Kwikwetlem First Nation (KFN), and Kiewit Ledcor Trans Mountain Partnership (KLTP). This monitoring report provides a summary of the meeting on August 31, 2020. Monthly in-person site visits are tentatively planned to resume in September, 2020.

Date	August 31, 202	20	Time of Call	2:00 PM	Time of Call	3:30 PM		
	-		(Start):		End:			
Format	Web-based co	Neb-based conference call with Trans Mountain presenting photographs, documents						
	and/or videos	and/or videos relevant to the expansion of the Westridge Marine Terminal.						
DFO	DFO - TMX Re	view and Enga	agement Team,	Fish and Fish I	Habitat Protection	n Program:		
participants	R.L. (A/ Senior	Biologist), W.I	B. (A/ Team Lea	d) and K.J. (Bi	ologist)	-		
IAMC	Musqueam Na	tion: J.H. (IAM	C IM) and R.K. ((Environmental	Stewardship Te	chnician)		
participants	IAMC – Monito	ring Subcomm	ittee: C.T. (IAM	C representativ	e – Burrard Inlet	and Lower		
	Fraser River, f	rom Tsleil-Wau	ituth Nation), R.	C. (IAMC repre	sentative – Albei	rta First		
	Nations) and K	.R. (Technical	advisor to IAMC	;)				
	Note: R.C. and	I K.R. joined at	~2:20 PM					
Other					Manager), L.B. (
participants					3.J. (Chief Enviro	nmental		
			ental Inspector)					
		rst Nation (KFN	N): M.J. (Project	IM)				
Contractor/equip		Role						
at the time of the	call							
DB Bremerton		Moored along the shoreline for works on cell 4 (obstruction removal).						
Nearshore Barge		Moored along the shoreline for woks on Cells 1, Arc 1A and 2. Sheet- piles were driven by a vibratory or impact hammer. All works in this area were conducted in the dry prior to the least risk biological window (LRBW), which recommenced on August 16 th . During the LRBW in-water pile driving occurred on cell 2.						
Offshore barges (e	e.g. DB	Installing piles for Mooring Dolphin 1, 2 and 3 via vibratory and impact						
General)		pile driving.						
IAMC/ IAMC Indig	genous Monito	Observation	s and Commen	ts				

JH asked if the water from the concrete spoils is going to the wastewater treatment facility on-site. TA explained the water is pumped to a containment bin and then is removed by a hydro vac and taken offsite to be disposed of at a treatment plant. SD added that the first few parts of a new wastewater treatment plant on the foreshore at the WMT are being installed currently.

CT asked if welding above water is observed by a regulator while the work is happening (i.e., how is compliance ensured)? WB explained that DFO's oversight relates to the *Fisheries Act* authorization and fish and fish habitat, in general. When considering welding over water, DFO considers the possibility of anything



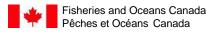
entering the water. KM added that the primary regulator that has oversight of various forms of construction at the WMT (including welding) is the Canadian Energy Regulator (CER) and they undertake regular environmental and safety inspections, including a recent in-person inspection. KR offered to chat further with CT about this as he recently had a call with the CER.

JH asked if there have there been any fish school sightings. SD confirmed a juvenile salmon school was observed recently; however, herring schools have not been spotted since winter. SD reported that salmon did not exhibit a behavioural response to the acoustic deterrent, which was expected. Generally, herring are more sensitive to underwater noise than salmon, so they are more likely to be deterred by the acoustic deterrent. More information is provided in the report produced by JASCO.

CT was curious if there was a way to keep harbour seals away from the construction zone after SD explained they have been continuously interrupting pile driving offshore. KM and WB explained that the Marine Mammal Regulations, under the *Fisheries Act*, prohibit disturbance to marine mammals.

CT asked what the best way to share the information associated with the JASCO report from TM was. WB suggested discussing the contents of the report and the summary provided by SD during the debrief call with DFO.

After the meeting, additional inquires regarding the on-site wastewater treatment plant, the fish acoustic deterrent system and vibratory pile driving were brought forward by RK. The inquires were further discussed during the CVA debrief call on September 15th.



Summary of inspection discussions (use initials of participants) Introductions

Agenda Review

In addition to the agenda review, KM noted that SD can provide an overview of the report "Fish Deflection System Sound Source Characterization" by JASCO, a TM subcontractor, at the end of the presentation.

WB noted further discussion of this report with IAMC representatives can occur during a CVA debrief/planning conference call.

Construction Update

SD provided an overview of the site layout at the WMT and described the construction works that have occurred since the July 9th compliance verification conference call, with a focus on most recent works. SD stated that there has been lots of work conducted offshore on the superstructure. SD also noted that as of the 16th of August we have entered the least risk biological window (August 16 – February 28); subsequently, nearshore works have recommenced.

SD showed a labelled aerial photo of the WMT construction site, which displayed the numbered foreshore cells and arcs. SD provided an overview of the construction works in the foreshore:

- Cell 1 and Arc 1A: installed sheets and backfilled during low tide in the dry.
- Cell 2: sheets installed via vibratory and impact pile driving during low tide in the dry prior to August 16th. Since the least risk biological timing window recommenced on August 16th, sheets have been fully installed.
- Cell 4: template installed and sheets are being threaded.
- Ongoing work on the derailment wall along eastern foreshore.
- Deep soil mixing and jet grouting works (ground improvement work) on the eastern foreshore are still ongoing behind and within completed foreshore cells.

SD showed a schematic overview of the WMT site and a photo showing offshore works. SD provided an overview of the construction works:

- Overall, lots of work is being conducted on both Berths 1 and 2.
- Mooring Dolphins 1, 2 and 3: vibratory and impact pile driving.
 - MD 1: welding completed.
 - MD 2: impact pile driving.
 - MD 3: vibrated down and ready to be impacted.
- Breasting Dolphin 5 and 6: dolphin jackets are set and crews are now welding shear lugs to connect to the piles inside the jackets.
- Loading Platform 1/2 and Trestle 7: concrete pours and pre-cast deck panels are set (only 1 deck panel left to install) it now looks like a dock structure.
- Mooring Dolphins 4, 5 and 6: jackets that were previously installed are now welded and permanent platforms have been installed on top. Permanent catwalks have been installed between the dolphins. Trestle spans between the dolphins have also been worked on.
- Trestle Span 3 and 4: are being formed up with rebar in preparation for concrete pours in the pile caps.
- Trestle Span 6: concrete pile cap has been poured.



 Junction Platform: previously driven now have rebar inside them and falsework installed in preparation for pouring concrete caps.

SD described specific works and mitigation measures in the foreshore:

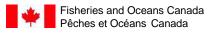
- Derailment wall: segment one has been poured (eastern most section). In segment 3 forms and rebar have been installed in order to pour the concrete footing.
 - Note all works on derailment wall are in isolation from the marine environment.
- Expanded eastern foreshore: ongoing deep soil mixing and jet grouting works.
 - WB: Have there been any changes to the mitigation measures in place regarding sediment and erosion control or have any issues been observed?
 - SD: Deep soil mixing occurs within the foreshore cells. TM has been monitoring the marine water quality outside of the cells when doing deep soil mixing closer to the ocean. There are grout spoil curing pits located in Arcs 8A and 9A. TM takes turbidity and pH readings outside of those arcs in the marine environment and they have not seen an increase in turbidity, pH or have identified any other issues as deep soil mixing works are not under pressure and the cells provide a barrier to the ocean. Other mitigations measures include berm and sediment fences and silos have been expanded from the eastern foreshore onto western foreshore – there have been no issues.
- Barge loading of grout spoils is now occurring. Proper grout management ensures no material enters the ocean.
 - When deep soil mixing is occurring, a pit is pre-dug next to it so that excess grout flows into the pit and then the liquid grout material is excavated into bins. The loader collects and then dumps the liquid grout material into the spoil pits. A berm of grout is left around the periphery of the pit to enhance containment. Grout material hardens over 24 to 48 hours. A new conveyor has been installed along the western foreshore. The cured grout spoils are excavated out of the pits, transferred over to the hopper and then are conveyed on a belt out to the barge that is contained below on all four sides (this started last week). TM is currently using a plastic sheet to ensure no hardened grout ends up falling off the belt into the marine environment.
 - KLTP, a subcontractor, is in the process of designing a more permanent structure (like a rigid sloped slide) that will be fixed to the bottom of the conveyor should there be any loss of material off of the conveyor so that it will slide back towards the barge.
 - TA: One of the biggest concerns is making sure that when it rains that water or moisture coming off the conveyor is properly contained before reaching any water surface.
 - SD: TM will have pumps and containment on the barge so that when it rains they can capture water as it could have a high pH even though the spoils are cured.
- Cell 1, Arc 1A and part of cell 2 were installed during low tide in dry conditions (prior to the least risk biological window).
- Cell 2: crews finished threading sheet piles and closed the cell. Sheet piles were installed by vibratory and impact pile driving.
 - Since pile driving was in-water, a fish and invertebrate salvage was necessary.
 - Fish and invertebrate salvage occurred under a fish salvage permit in cell 2 after it was closed during low tide using minnow and crab traps.



- A red rock crab, a bay pipefish, a few hermit crabs and a few shore crabs were captured and transported to Barnet Marine Park where they were released.
- Cell 4: installed H-piles and pin piles and set the template prior to threading some of the sheet piles.
 - Rock obstructions were removed using a clamshell bucket and the rock was placed on the beach.
 - Once all the piles are threaded, a fish salvage will be undertaken inside of the cell.
 - Sheets may be impacted if the sheets meet hard substrate.
 - Monitoring of water quality is conducted outside of the turbidity curtain (same procedure as used for the removal of riprap). All water monitoring has been compliant so far.
 - WB: when you are removing an obstruction it is treated as if it were part of the previous riprap wall?
 - SD: Yes. Mitigation requirements are the same. Any work has to be done within the authorized footprint (i.e., within the footprint of the cells or arcs or backshore of it). Any material removed must be placed within the project authorized work area. TM followed the same water quality monitoring plan as for riprap removal. A lot of obstruction removal was completed during low tide, so the turbidity generated was low.
- Can see that the turbidity curtain, which encompasses the whole work area, is working well (visible on slide).

SD described specific works and mitigation measures in the offshore:

- Overview: Trestle Span 6 (poured and ready for girders), Junction Platform 1 (falsework is installed for upcoming pours), Mooring Dolphins 4, 5, and 6 (have gangways across them), Trestle 7 and the Loading Platform (decking work), and Mooring Dolphins 1, 2 and 3 (impact pile driving).
- WB: what diameter are the piles that are being vibratory or impact pile driven?
 - SD: Resumed pile driving on the Mooring Dolphin piles last week and the piles are the larger ones (1.981 m in diameter).
- Loading Platform 1/2: concrete caps poured, girders placed across and decking is being built on top of it.
- Trestle 7: pre-cast concrete deck panels are placed, formwork along the edges has been installed in preparation for pouring a concrete deck on top of the panels.
- Mooring Dolphin 6: jacket is welded and is completed (i.e., jacket is placed on top of the four piles, shear lugs are welded, and a permanent platform has been welded on top of the jacket).
- Mooring Dolphin 4: extends over to MD 5 via a permanent gangway.
- Junction platform 1: all piles have been installed, the deck is fully built out and falsework has been installed so that concrete caps can be poured.
- RL: Is impacting occurring offshore?
- SD: Vibratory and impact pile driving is occurring for offshore piles.
- SD: following fish mortality events, one idea was to see if piles could be driven deeper with just vibratory pile driving to reduce the distance over which the piles need to be impacted. A



subcontractor, KLTP, worked with Ape who manufactures hammers. They built a custom large vibratory hammer (Tandem APE-600). With this new hammer they can drive piles 5 to 7 m deeper into the till (big improvement in depth), but impacting is still needed to drive the piles to refusal.

- TA: Approximately two to four hours of impacting is required to reach engineer design depth.
- KM: This has been a good mitigation measure so that TM spends less time impact pile driving as vibratory pile driving creates less noise.
- RL: when was this new hammer first used?
- SD: The new hammer was first tested on mooring dolphin piles in early July.
- KR: I know fish mortalities associated with driving the larger piles was a problem. Is the new vibratory hammer being brought in because past mitigation measures were insufficient (e.g. secondary bubble curtain and acoustic deterrent system)?
 - SD: When TM had the fish mortality incidents and then a two month pause on impact pile driving, TM looked at alternative options to mitigate risk (e.g. second bubble curtain, an acoustic deterrent system, and a larger vibratory hammer). TM started using the new hammer in early July and started using the acoustic deterrent on April 7th. No fish mortality events have occurred since; however, TM was driving the smaller piles in April, May and June. TM is driving the larger piles now.
- SD: TM has had difficulties testing the secondary bubble curtain as harbour seals are almost constantly within the 150 m exclusion zone. This has led to four days without pile driving due to their presence.
- Mooring Dolphin 1: welders are splicing the piles, coating them and then the weld shelter and templates are taken off. Piles will then be vibratory and impact driven.
 - TM is deploying fish acoustic deterrents prior to impact driving (a TM contractor is deploying the deterrents).
 - Two acoustic deterrents are deployed at 1/3 and 2/3 depth. TM has had difficulties knowing when to deploy the deterrents as pile driving has been continuously interrupted by the presence of harbour seals. It doesn't seem as though the deterrents have any impact on the seals.
 - SD tried to a play video with the acoustic deterrents on, but it was not audible. The video will be posted to the FIRMEX site.
- RL: Have the ramp up procedures changed at all?
- SD: No. The acoustic deterrent is run for ~30 minutes, then the sledgehammer is used to strike the pile, then the bubble curtain is run for 1 minute (previously 3 minutes) and finally there is a 6 minute ramp up for the impact hammer before it is run at a high drive speed.
- SD: TM has only been able to drive two piles in the last two weeks due to presence of harbour seals (Mooring Dolphin 2A and Mooring Dolphin 2D).
 - MD2- pile D: peak noise level was ~204.7 dB with the bubble curtains running.
 - MD2- pile A: peak noise level was ~202.8 dB.
- SD: Acoustic deterrents must be raised out of the water before commencing impacting.
- WB: Are acoustic deterrents removed prior to starting the bubble curtain as well?



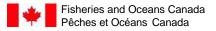
- SD: Yes, they are usually raised out of the water before the bubble curtain is fired up as it creates a lot of wash and pushes them around. TM does not want them to hit the barge while they are being pulled out.
- RL: How long does it take to pull the acoustic deterrents out of the water?
- SD: 10 minutes. The 150 m exclusion zones need to be free of harbour seals for 30 minutes before commencing impact pile driving. The acoustic deterrents run for 10 to 15 minutes prior to the end of the 30 minutes of no seal sightings. Seals have halted this process a lot recently.
- TM hopes to resume impact pile driving with the second bubble curtain installed. This is dependent on the amount of seal sightings.

Further Questions:

- WB: Have any other marine mammals been observed recently?
 - SD: Only harbour seals recently.
- KR: Is it typical to observe this many seals at this time of year?
 - SD: Harbour seals are very abundant within Burrard Inlet. TM did not observe as many in the late spring or early summer.
- KR: Is there any advanced warning given for fish salvages conducted at Westridge Marine Terminal? Is it possible to give DFO or IAMC advanced warning?
 - TA: We can try, TM completes the salvage immediately after the cells are closed. Closing the cells can take up to a week and the salvage needs to happen the next day.
 - KR: In lieu of the issues that occurred last time during the fish salvage, building trust and sharing how the activities are being done is important. IAMC monitors may wish to observe the fish salvage. Short notice is difficult, but some notice would be nice.
 - KM: The condition of fish salvage permit requires TM to notify DFO's regional office prior to conducting the fish salvage.
- KR: There was a water quality issue with cement pouring. Since concrete pours are ongoing, have there been any changes to practices to avoid spills?
 - SD/TA: TM had two spills during concrete pours. TM has worked with KLTP to put in place a solid box containment as secondary containment. The tube for pouring the cement has been changed so that pourer knows when the cement is coming up, and there have been changes to the pour rate. The air pocket was bubbling, which has been corrected. There have been no issues since.
- KR: Is the IM for TM on the call?
 - MJ: Yes.
- SD provided a high-level summary of the JASCO report "Fish Deflection System Sound Source Characterization":

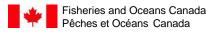
At the request of DFO, TM and DFO had a meeting, as questions regarding the nature of the noise that is produced by the underwater acoustic fish deterrent system were raised.

TM/JASCO deployed both deterrent devices and measured underwater noise at a range of distances out to 1 km. JASCO collected the data and created a report to illustrate noise properties and how it would be perceived by hearing abilities of killer whales, harbour seals, herring and salmon. The report considered injury and disturbance thresholds. The report describes the sound



produced by the acoustic deterrent system as a non-impulsive 50–500 Hz linear frequency modulated signal, at a repetition rate of 4 Hz. The acoustic deterrent does not exceed any injury threshold for the four species considered. For behavioural disturbance criteria (there are several caveats given that thresholds for behaviour disturbance are not well established) Killer whales and salmon may be able to perceive the sound, but it is outside their range of best hearing. At close range it is likely to deter herring and seals and can affect their behavior. TM is happy about that, because they want it to deter herring. It likely would not deter them at range (i.e., 40-50 m out from the source). TM has not observed harbour seals leaving the exclusion zone when the acoustic deterrent system is on.

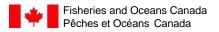
- WB: may SD provide a summary of the marine mammal monitoring conducted at the exclusion zones prior to impact pile driving?
 - SD: TM has two exclusion zones: one at 150 m for harbour seals and the other at 1 km for all other marine mammals. These are monitored for 30 minutes before impact pile driving can start. If works are in progress and they see a seal within the 150 m exclusion zone then work stops and work does not recommence until the species is absent from the applicable exclusion zone.
- WB: DFO plans to resume in person CVA's during September.



GENERAL AND MISCELLANEOUS MITIGATION MEASURES

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

Schedule					
2.2.6 All nearshore in-water F					
water large tide level) at the V August 16 to March 15 each		e Terminal sha	Il only be carried	out during a worl	k timing window from
Discussed: Xes	Issue(s)	□ Yes	Issue(s)	□ Yes	Not applicable
	identified:	⊠ No	unresolved:	\square No	
Comments					
TM acknowledged that all	work complete	d prior to Auc	ust 16 th is outsid	de the timina w	indow (i.e., works on
the foreshore cells were be					
conducted offshore beyond					
pile driving within 50 m of t	the higher high	-water large t	ide only occurre	ed after August	16 th .
Action Items					
None.					
Monitoring					
3.1 A qualified environmental					
activities, and shall monitor the standards and avoidance me					
impacts to fish and fish habita				,	
Discussed: 🛛 Yes	lssue(s)	□ Yes	lssue(s)	□ Yes	Not applicable \Box
🗆 No	identified:	🛛 No	unresolved:	🗆 No	
Comments					
The Lead Environmental Ir					
construction since the last	•		•	lified environm	ental professionals are
conducting monitoring of c	onstruction act	ivities at the \	WMT.		
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					
Discussed: Xes	Issue(s)		Issue(s)		Not applicable
	identified:	⊠ No	unresolved:	\square No	
Comments					
	there had bee	n multiple del	avs to pile drivir	na recently due	to the presence of one
Trans Mountain 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 pile driving.					
Action Items					
None.					
Temporary Structures and Decommissioning of Existing Structures					
The application for a <i>Fisheries Act</i> authorization states that a floating debris boom will be secured around the work area to collect drifting debris during demolition of the existing utility dock (page 3.1).					
	a demolition of th	ne existina utili	tv dock (page 3.1).	
Discussed: Ves	g demolition of the Issue(s)	<u>he existing utili</u> □ Yes	ty dock (page 3.1 Issue(s)). □ Yes	Not applicable 🖂

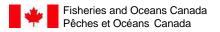


2.2.5 Temporary structures installed below the high-water mark shall be decommissioned and removed when they are no longer being used for construction purposes.					
Discussed: Ves	Issue(s)	Issue(s) 🗆 Yes	Not applicable 🖂		
⊠ No	identified: 🗆 No	unresolved: 🗆 No			
Comments					
No structures are currently	being decommissioned.				
Action Items					
None.					
Pump Intake Screening					
Addendum, Fisheries and Oc Oceans Canada 1995), and F	eans Canada's <i>Freshwater Int</i> Fisheries and Oceans Canada'	reened in accordance with specifi ake End-of-Pipe Fish Screen Gui s Guidelines for Minimizing Entra (Fisheries and Oceans Canada 1	delines (Fisheries and inment and Impingement		
Discussed: 🗆 Yes	Issue(s) 🛛 Yes	Issue(s) 🛛 Yes	Not applicable 🖂		
🖾 No	identified: 🗆 No	unresolved: 🛛 No			
Comments					
Screens for known water in reported.	ntakes have been discussed	during previous site inspectio	ns. No issues were		
Action Items					
None.					
Fish Salvage					
2.2.3 Fish salvage and reloca avoid and minimize adverse i		propriate, prior to the start of cons	struction activities so as to		
Discussed: 🛛 Yes	Issue(s) 🗆 Yes	Issue(s) 🗆 Yes	Not applicable		
□ No	identified: 🖂 No	unresolved: 🗆 No			
Comments					
	ted in foreshore cell 2 in Au eased at Barnet Marine parl	gust. Minnow and crab traps w <. No issues were reported.	vere used. Captured fish		
Action Items					
None.					
Integrity of Habitat Offsets					
4.7 The Proponent shall not carry on any works, undertakings or activities that will adversely disturb or impact the offsetting measures.					
offsetting measures.		gs or activities that will adversely	disturb or impact the		
	carry on any works, undertaking	gs or activities that will adversely Issue(s) Yes	disturb or impact the Not applicable ⊠		
offsetting measures.	carry on any works, undertaking				
offsetting measures. Discussed:	carry on any works, undertaking	Issue(s)			
offsetting measures. Discussed: □ Yes ⊠ No	carry on any works, undertaking Issue(s)	Issue(s)			
offsetting measures. Discussed: □ Yes ⊠ No Comments	carry on any works, undertaking Issue(s)	Issue(s)			
offsetting measures. Discussed: □ Yes ⊠ No Comments Offsetting measures have	carry on any works, undertaking Issue(s)	Issue(s)			

MITIGATION MEASURES SPECIFIC TO PILE DRIVING

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

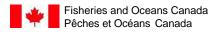
Underwater Sound Pressure Level Reduction						
2.2.8 A vibratory hammer will be used for pile driving where practical and feasible, and all in-water pile driving activities						
will be monitored via hydroph						
Discussed: 🛛 Yes	Issue(s)	□ Yes	Issue(s)	□ Yes	Not applicable	
🗆 No	identified:	🛛 No	unresolved:	🗆 No		
2.2.9.1 To avoid death of fish, mitigation measures (e.g., bubble curtain around the full wetted length of the pile, fish exclusion, etc.) must be implemented.						
Discussed: 🛛 Yes	Issue(s)	□ Yes	lssue(s)	□ Yes	Not applicable	
□ No	identified:	🛛 No	unresolved:	🗆 No		
Comments	I					
Mitigation measures for pi	e driving were	discussed, in	cluding the curre	ent ramp-up se	quence (running the	
acoustic deterrent, striking	the pile with th	e sledgeham	mer, running the	e bubble curtai	n and initiating the	
impact hammer ramp-up),						
The new hammer is able t	o vibrate piles o	deeper into th	e substrate, les	sening the dura	ation of impact pile	
driving.						
Action Items						
None.						
Underwater Sound Pre						
2.2.9.2 Monitoring via underv						
being driven to verify that une finfish.	derwater sounds	do not exceed	the 30 kPa (209.	5 dB re: 1 µPa)†	threshold for injury to	
Discussed: 🛛 Yes	lssue(s)	🗆 Yes	lssue(s)	□ Yes	Not applicable 🗆	
🗆 No	identified:	🖾 No	unresolved:	🗆 No		
2.2.9.3. Outside of the least r	isk window for B	urrard Inlet (Au	ugust 16 – Februa	ary 28), a more c	onservative underwater	
sound threshold of 22.5 kPa						
levels exceed this threshold,						
are to cease immediately and						
Discussed: 🛛 Yes	Issue(s)	□ Yes	lssue(s)		Not applicable	
□ No	identified:	🖾 No	unresolved:	□ No		
2.2.9.4 If underwater noise re						
conditions 2.2.9.2 or 2.2.9.3,						
occurring. These actions may place to increase their effecti					on measures already in	
Discussed: Xes					Not applicable	
	identified:		unresolved:			
		⊠ No				
2.2.9.5 Upon commencement of pile driving, or recommencement after a delay 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.			e generation of pe	eak pressure and		
Discussed: 🛛 Yes	Issue(s)	□ Yes	Issue(s)	□ Yes	Not applicable	
□ No	identified:	⊠ No	unresolved:			
Comments	I					



TM demonstrated that they are monitoring underwater noise during vibratory and impact pile driving and that levels have remained below the threshold specified in the authorization.						
Action Items						
None.						
Marine Mam	nmal Monito	oring				
monitoring mus for harbor seals	st be conducte s, which will ha	d to determine if	marine mamn	<u>).</u>	vithin an exclusio	es or more, visual on zone of 1 km (except
Discussed:	⊠ Yes	Issue(s)	□ Yes	lssue(s)	□ Yes	Not applicable \Box
	□ No	identified:	🛛 No	unresolved:	🗆 No	
zones for 30 m		1				neir respective exclusion
Discussed:	⊠ Yes	lssue(s)	□ Yes	lssue(s)	□ Yes	Not applicable \Box
	🗆 No	identified:	🛛 No	unresolved:	🗆 No	
mammals are o	bserved within their respect	n their respective	e exclusion zor	ne, pile driving act	ivities must ceas	e mammal or marine se until all marine within their respective
Discussed:	⊠ Yes □ No	Issue(s) identified:	□ Yes ⊠ No	lssue(s) unresolved:	□ Yes □ No	Not applicable \Box
boundary, the e	water noise re exclusion zone eshold is not ex	radius must be	that the thresh widened to a r	new outer limit, wh	nere sound recor	1 km exclusion zone rdings demonstrate that vith within this new
Discussed:	⊠ Yes	lssue(s)	□ Yes	lssue(s)	□ Yes	Not applicable
	🗆 No	identified:	🛛 No	unresolved:	🗆 No	
2.2.9.10 Pile driving may only be carried out during daylight hours to enable effective visual monitoring of marine mammal exclusion zones.						
Discussed:	⊠ Yes	lssue(s)	□ Yes	lssue(s)	□ Yes	Not applicable 🗆
	🗆 No	identified:	🛛 No	unresolved:	🗆 No	
Comments						
TM is carrying out marine mammal monitoring. Harbour seals were observed within the seal-specific 150 m exclusion zone prior to the commencement of pile driving, resulting in multiple work stoppages.						
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	lssue(s) identified:	□ Yes	lssue(s) unresolved:	□ Yes	Not applicable \Box

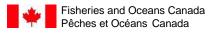


🗆 No	⊠ No	🗆 No				
Comments						
0		heet piles were threaded. The	0			
•	I fish and invertebrates capt	ured were released at Barnet N	larine park. No issues			
were reported.						
Action Items						
None.						
Turbidity Monitoring						
43. Should visual monitoring during in-water pile installation 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	Issue(s) 🗆 Yes	Issue(s) 🛛 Yes	Not applicable 🗆			
□ No	identified: 🖂 No	unresolved: 🗌 No				
Comments	Comments					
No water quality issues were reported during in-water pile installation. Turbidity curtains are in place and water quality monitoring has recorded no exceedance in water quality guidelines for turbidity outside of the turbidity curtain.						
Action Items						
None.						

MITIGATION MEASURES SPECIFIC TO FORESHORE CONSTRUCTION

Riparian Pla	Riparian Planting and Material Handling						
Westridge M	larine Termi	nal Fisheries	Act Authoriz	ation Conditio	ns		
2.2.4 Disturbed	l riparian areas	s shall be replan	ted as appropr	iate, with native r	on-invasive spe	cies of vegetation.	
Discussed:	□ Yes	lssue(s)	□ Yes	lssue(s)	□ Yes	Not applicable 🖂	
	🛛 No	identified:	🗆 No	unresolved:	🗆 No		
Westridge M	larine Termi	nal Environm	ental Protec	tion Plan Com	mitments		
30. Unless othe accordance wit			n all excavated	d [marine] materia	al and dispose at	a land-based facility in	
Discussed:	□ Yes	lssue(s)	□ Yes	lssue(s)	□ Yes	Not applicable 🖂	
	🛛 No	identified:	🗆 No	unresolved:	🗆 No		
Comments	Comments						
Not applicable.							
Action Items							
None.							

Water Quality Maintenance and Monitoring					
Westridge Marine Terminal Fisheries Act Authorization Conditions					
	2.2.1 Effective sediment and erosion control measures (e.g., a turbidity curtain, etc.) shall be implemented before				
starting construction and shall be maintained during construction activities, as appropriate, to avoid the deposit and					
dispersion of sediment into the marine environment.					
Discussed: 🛛 Yes	Issue(s)	□ Yes	lssue(s)	□ Yes	Not applicable \Box



	□ No	identified:	⊠ No	unresolved:	🗆 No		
						in order to contain	
marine sediment suspended in the water column and limit the extent of sediment dispersion. During severe weather							
conditions that may reduce the effectiveness of, or impede the visual monitoring of, the turbidity curtain (e.g., > 70 km/h winds, or dense fog), works, undertakings or activities that may increase suspended sediment concentrations within the							
				ity curtain, must b			
Discussed:	⊠ Yes	Issue(s)		Issue(s)		Not applicable	
	🗆 No	identified:	🛛 No	unresolved:	🗆 No		
Westridge N	Aarine Term	inal Environm	ental Protec	tion Plan Com	mitments		
				ality monitoring (W			
					ict WQM to asse	ss the effectiveness of	
Discussed:		ify turbidity curta				Natangliaghla 🗆	
Discussed.	⊠ Yes	Issue(s)	□ Yes	Issue(s)	□ Yes	Not applicable	
	□ No	identified:	⊠ No	unresolved:	□ No		
				n Control Plan			
			act during Fore	shore constructio	n activities to ens	sure sediment laden	
water is not dis							
Discussed:	⊠ Yes	Issue(s)	□ Yes	lssue(s)	□ Yes	Not applicable	
	🗆 No	identified:	🛛 No	unresolved:	🗆 No		
Comments							
						ructions prior to	
						the rock was placed on	
						iprap shore and	
	0		•			project authorized work	
area. Monitoring of water quality was conducted outside of the turbidity curtain using the same procedure as							
used for the removal of riprap. Most of the obstruction removal was completed during low tide so the turbidity							
generated was fairly low and remained within the turbidity curtain, with no water quality issues reported.							
	The turbidity curtain, which encompasses the whole work area, is reported to be working well.						
Action Items	ò						
None.							

Additional comments or action items None.