Site Visit Report: SV-2019-11-25

Trans Mountain Expansion Project – Westridge Marine Terminal Visit

Date	2019-11-25	**Time on site**	0915	**Time off site**	1230
DFO attendees	S.W and W.B.				
IAMC attendees	One Indigenous Advisory Monitoring Committee (IAMC) monitor (J.H)				

On-site contractor/equipment	**Role**
Trans Mountain	Site Management
KLTP	Prime construction contractor
Triton Environmental	Fish salvage activities in cell 10.
Hemmera	Water quality monitoring during riprap excavation along foreshore
DB General DB Bremerton DB Olympia	Derrick barges (DB) General was working offshore splicing breasting dolphin piles 7 and 8. DB Bremerton and Olympia were working in the nearshore on sheet pile cell 10 (getting ready to remove template) and cell 8 (threading sheets), respectively.
Burrard (crawler crane)	Working offshore and conducting preparatory works for construction of the superstructure (e.g., caps, decking).
JJM Barge	Working from a barge to remove existing riprap along the western part of the foreshore. Excavated riprap placed on separate spoil barge.
Time	**Inspection Activity**

0915	DFO and the IAMC monitor met representatives at the KASK site and were provided a brief overview of the on-going works. Representatives included:
	• Kiewit-Ledcor Trans Mountain Partnership (KLTP, Environmental Manager [A.A]);
	• Trans Mountain (TM)
	  ○ Environmental Construction Analyst [P.B]
	  ○ Chief Environmental Inspector [B.P]
	  ○ Construction Manager [T.A])
	  ○ TM Environmental Inspector (TM EI [S.D])

1030	Arrived at the terminal. The Trans Mountain Indigenous Monitor joined the site inspection.
1030-1230	Walk along foreshore: -Observed JJM removing existing riprap from the western portion of the foreshore (works have been on-going for the past 10 days, Photo 1). There was a yellow turbidity curtain around the spoil barge and the JJM barge, as well as around the excavation work area; the curtain appeared to be functioning to contain sediment-laden water (Photo 2). -Observed a white spill boom along the inside edge of the turbidity curtain surrounding the riprap excavation work area. TM EI indicated that it was installed as a preventative measure following observations of a light sheen floating on the surface of the water during excavation (Photo 3). The results of water and sediment sample analysis concluded that the sheen is organic and naturally occurring. The TM EI mentioned that a similar sheen was present during previous riprap excavation works along the eastern foreshore. -Observed white polysheeting covering areas where riprap was removed. The polysheeting was being weighed down by sandbags and

	appeared to functioning as intended to limit sediment erosion into the marine environment. -The TM EI and DFO discussed Trans Mountain's request to amend the existing *Fisheries Act* Authorization because of a necessary re-design and re-location of the marine construction office. -Observed Hemmera conducting water quality monitoring for turbidity near riprap excavation works. Monitoring occurs twice/day and at 10 m (10 sample points) and 30 m (10 sample points) from riprap excavation works. Water samples are taken at the surface and at 2 m depth. The TM EI indicated that there has been one occurrence of levels in excess of Canadian Council of Ministers of the Environment (CCME) water quality guidelines since commencement of the work ~ 10 days ago, and works were shut down and only resumed once turbidity levels returned to background conditions. -Observed yellow turbidity curtain around active works associated with sheet pile cells 8 and 10. The turbidity curtain appeared to be functioning to contain sediment-laden water. -The TM EI indicated that Triton had been on site to conduct fish salvage in cell 10 (2nd round of salvage). During the first round, Triton captured sculpins and perch. Fish salvage, handling, and relocation procedures follow Trans Mountain's updated fish salvage standard operating procedure. -The TM EI indicated that two California sea lions were observed sitting on the floats of the marine construction safety boom the week prior to the site visit, but the sea lions had not been seen by the TM EI for the past three days. No pile driving was occurring when sea lions were observed in the area. The TM EI also indicated that a school of Pacific herring was observed in the area a few weeks prior to the site visit. The TM EI indicated that decommissioning and removal of the existing small utility dock (Dock '59') will begin in the next few weeks. -DFO and the TM EI discussed installation of a fine-mesh net barrier to prevent fish from becoming trapped within the shallow area located between cell 6 and cell 7 (i.e., within the 'arc cell'), once the gap in sheet pile cell 6a is closed (Photo 4). Fish may otherwise gain access during high tide when water levels are high enough to flood the area where sheet pile cells 7 and 8 abut the foreshore. The TM EI said they will provide specifications on the net to DFO. -Observed installation of three layers (lock blocks [Photo 5], a berm, and a sediment fence, Photo 6) along the foreshore to capture potential run-off during concrete works that will commence during the next few weeks.

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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.
☒ Compliant ☐ Non-compliant ☐ Not observed/unknown ☐ Not applicable
Comments
Nearshore works were taking place within the work timing window.
Action Items
N/A
Monitoring
3.1 A qualified environmental professional must be on-site during the carrying on of in-water works, undertakings and activities, and shall monitor the works, undertakings or activities on a systematic and on-going basis to ensure that standards and avoidance measures to avoid impacts to fish and fish habitat are effective, and that unauthorized impacts to fish and fish habitat are avoided.
☒ Compliant ☐ Non-compliant ☐ Not observed/unknown ☐ Not applicable
Comments
Trans Mountain EI and the Trans Mountain Indigenous Monitor (TM IM) were on site at the time of the inspection. DFO communicated with the TM IM to understand if he had any concerns or observations to report. The TM IM advised that they had no concerns or observations and that Trans Mountain is responsive to addressing their concerns.
Action Items
N/A
Marine Mammal Observations
2.2.7 In-water construction activities must cease if any marine mammal is observed adjacent to or within the project area such that there is risk of direct physical harm to the marine mammal. Construction activities may only resume once the marine mammal has been confirmed to have left the immediate area or has not been sighted for 30 minutes.
☒ Compliant ☐ Non-compliant ☐ Not observed/unknown ☐ Not applicable
Comments
No marine mammals were observed at the time of the site visit during in-water works.
Action Items
N/A
Temporary Structures and Decommissioning of Existing Structures
The application for a *Fisheries Act* 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).
☐ Compliant ☐ Non-compliant ☐ Not observed/unknown ☒ 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.
☐ Compliant ☐ Non-compliant ☐ Not observed/unknown ☒ Not applicable
Comments

At the time of the inspection, no temporary structures were installed below the high-water mark and the existing utility dock had yet to be demolished.
Action Items
N/A
Pump Intake Screening
2.2.2 Water intakes of any pumps shall be designed and screened in accordance with specifications outlined in the Addendum, Fisheries and Oceans Canada's *Freshwater Intake End-of-Pipe Fish Screen Guidelines* (Fisheries and Oceans Canada 1995), and Fisheries and Oceans Canada's *Guidelines for Minimizing Entrainment and Impingement of Aquatic Organisms at Marine Intakes in British Columbia* (Fisheries and Oceans Canada 1991).
☐ Compliant ☐ Non-compliant ☒ Not observed/unknown ☐ Not applicable
Comments
DFO did not observe any pumps in operation during the site inspection.
Action Items
N/A
Fish Salvage
2.2.3 Fish salvage and relocation shall be conducted, as appropriate, prior to the start of construction activities so as to avoid and minimize adverse impacts to fish.
☐ Compliant ☐ Non-compliant ☒ Not observed/unknown ☐ Not applicable
Comments
DFO did not directly observe fish salvage activities during the site inspection.
Action Items
N/A
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.
☐ Compliant ☐ Non-compliant ☐ Not observed/unknown ☒ Not applicable
Comments
The offsetting measures had yet to be installed at the time of the inspection.
Action Items
N/A

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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 hydrophone to ensure underwater peak pressures do not result in adverse impacts to fish.
☐ Compliant ☐ Non-compliant ☐ Not observed/unknown ☒ Not applicable
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.
☐ Compliant ☐ Non-compliant ☐ Not observed/unknown ☒ Not applicable
Comments
No vibratory or impact pile driving was occurring at the time of the site inspection.
Action Items
N/A
Underwater Sound Pressure Level Monitoring
2.2.9.2 Monitoring via underwater noise recordings must be conducted continuously and within 10 meters of the pile being driven to verify that underwater sounds do not exceed the 30 kPa (209.5 dB re: 1 µPa) threshold for injury to finfish.
☐ Compliant ☐ Non-compliant ☐ Not observed/unknown ☒ Not applicable
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.
☐ Compliant ☐ Non-compliant ☐ Not observed/unknown ☒ Not applicable
2.2.9.4 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.
☐ Compliant ☐ Non-compliant ☐ Not observed/unknown ☒ Not applicable
Comments
Conditions are specific to impact pile driving; impact pile driving was not occurring at the time of the site visit.
Action Items
N/A
Marine Mammal Monitoring
2.2.9.5 Prior to commencement of pile driving, or recommencement after a delay of 30 minutes or more, visual monitoring must be conducted to determine if marine mammals are present within an exclusion zone of 1 km (except for harbor seals, which will have an exclusion zone of 150 m).
☐ Compliant ☐ Non-compliant ☐ Not observed/unknown ☒ Not applicable
2.2.9.6 Work may only commence if marine mammals and harbor seals are not observed in their respective exclusion zones for 30 minutes.
☐ Compliant ☐ Non-compliant ☐ Not observed/unknown ☒ Not applicable
2.2.9.7 Exclusion zones must be monitored continuously during impact pile driving. If a marine mammal or marine mammals are observed within their respective exclusion zone, pile driving activities must cease until all marine

mammals leave their respective exclusion zone or they have not been sighted for 30 minutes within their respective exclusion zone.
☐ Compliant ☐ Non-compliant ☐ Not observed/unknown ☒ Not applicable
2.2.9.8 If underwater noise recordings reveal that the threshold of 160 dB is exceeded at the 1 km exclusion zone boundary, the exclusion zone radius must be widened to a new outer limit, where sound recordings demonstrate that the 160 dB threshold is not exceeded. Conditions 2.2.9.5 to 2.2.9.7 will need to be complied with within this new exclusion zone.
☐ Compliant ☐ Non-compliant ☐ Not observed/unknown ☒ Not applicable
2.2.9.9 Pile driving may only be carried out during daylight hours to enable effective visual monitoring of marine mammal exclusion zones.
☐ Compliant ☐ Non-compliant ☐ Not observed/unknown ☒ Not applicable
Comments
Conditions are specific to impact pile driving; impact pile driving was not occurring at the time of the site visit.
Action Items
N/A

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.
☐ Compliant ☐ Non-compliant ☒ Not observed/unknown ☐ Not applicable
Comments
DFO did not directly observe fish salvage occurring during the site inspection.
Action Items
N/A
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.
☐ Compliant ☐ Non-compliant ☐ Not observed/unknown ☒ Not applicable
Comments
No in-water pile installation activities were occurring at the time of the site visit.
Action Items
N/A

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MITIGATION MEASURES SPECIFIC TO FORESHORE CONSTRUCTION

Riparian Planting and Material Handling			
Westridge Marine Terminal Fisheries Act Authorization Conditions			
2.2.4 Disturbed riparian areas shall be replanted as appropriate, with native non-invasive species of vegetation.			
☐ Compliant	☐ Non-compliant	☐ Not observed/unknown	☒ Not applicable
Westridge Marine Terminal Environmental Protection Plan Commitments			
30. Unless otherwise approved by DFO, retain all excavated [marine] material and dispose at a land-based facility in accordance with applicable regulations.			
☒ Compliant	☐ Non-compliant	☐ Not observed/unknown	☐ Not applicable
Comments			
Riprap excavated from the foreshore was being retained and placed onto a spill barge; DFO did not directly observe the material being shipped or transported to land for disposal at a land-based facility.			
Action Items			
N/A			

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.			
☒ Compliant	☐ Non-compliant	☐ Not observed/unknown	☐ Not applicable
2.2.10 A turbidity curtain must be used to isolate the work area during the excavation of riprap in order to contain marine sediment suspended in the water column and limit the extent of sediment dispersion. During severe weather conditions (e.g., > 70 km/h winds, or fog), works, undertakings or activities that may affect the effectiveness of the turbidity curtain must be suspended.			
☒ Compliant	☐ Non-compliant	☐ Not observed/unknown	☐ Not applicable
Westridge Marine Terminal Environmental Protection Plan Commitments			
29. During in-water excavation or rip rap, conduct water quality monitoring (WQM) as per the Water Quality Management Plan during Rip Rap Removal (Appendix H of this EPP). Conduct WQM to assess the effectiveness of the turbidity curtain and modify turbidity curtain deployment, if required.			
☒ Compliant	☐ Non-compliant	☐ Not observed/unknown	☐ Not applicable
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.			
☒ Compliant	☐ Non-compliant	☐ Not observed/unknown	☐ Not applicable
Comments			
The turbidity curtain remains in place around the sheet pile cells and the foreshore. An additional turbidity curtain was installed around the JJM barge and the spoil barge, and around the foreshore, where riprap excavation was occurring. Polysheeting was covering areas along the western foreshore where riprap had recently been excavated.			
Action Items			
N/A			

Additional comments or action items
Update on follow-up action items from October 21 site inspection: • On November 4, 2019, Trans Mountain confirmed that it intends to decommission existing in-water infrastructure associated with the original berth (‘Pier 61) following the completion of the TMX Project. Trans Mountain also provided details to the IAMC monitor (forwarded on to the IAMC monitor by DFO) on the specifications of the new spill tray technology being used at the terminal. Action items from November 25 site inspection: • On November 26, 2019, Trans Mountain provided the requested specifications for the nets being used to isolate the area enclosed by the arc cell, once the gap in the cell is closed. The nets will be secured to the southern sides of the circular cells and will extend to shore, isolating the arcs. The nets are 1/8-inch mesh and measure 15 feet deep by 35 feet long. They have cork floats at the top and a lead line at the bottom.

Photo 1. JJM removing existing riprap located along western part of foreshore.

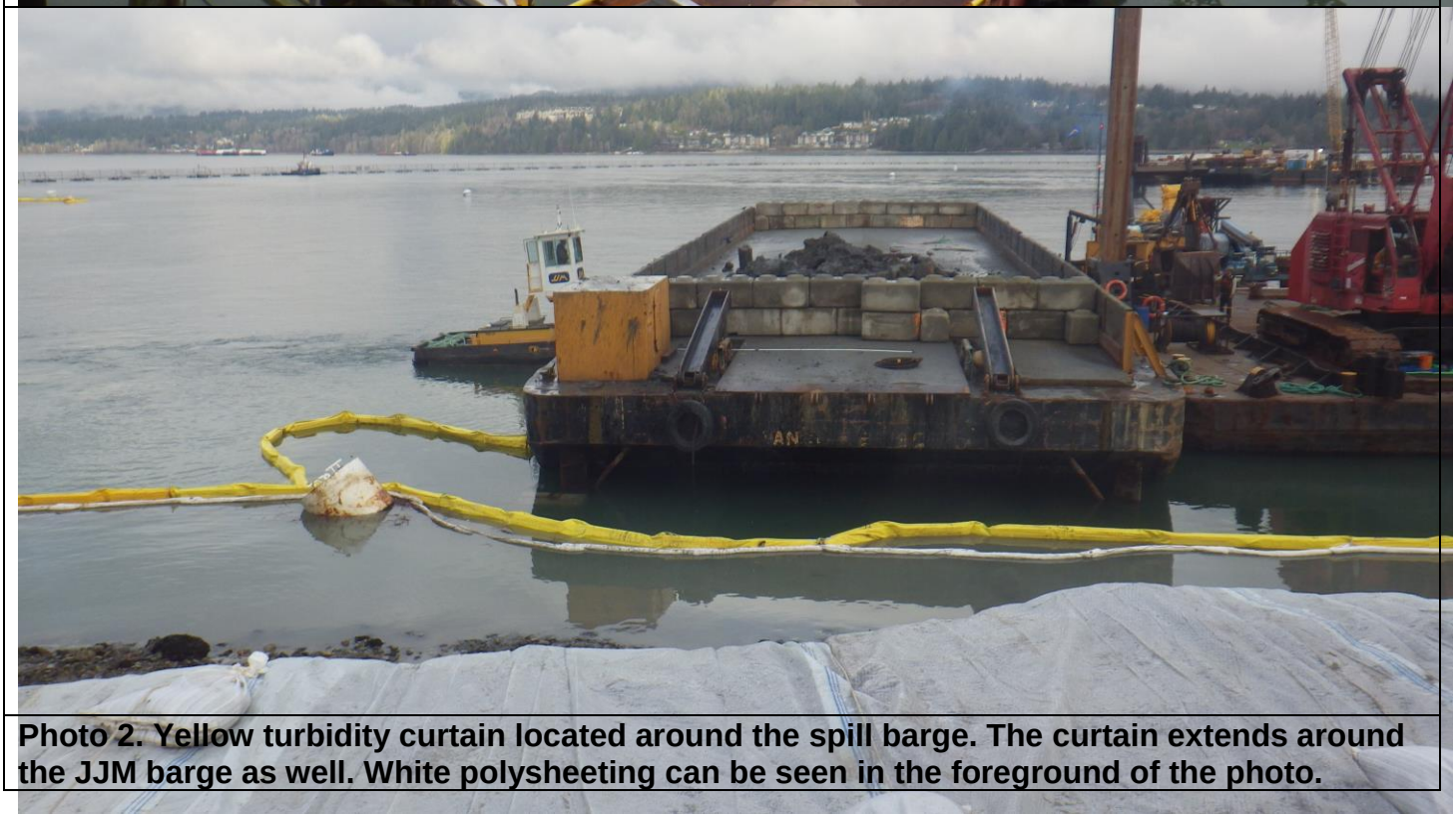

Photo 2. Yellow turbidity curtain located around the spill barge. The curtain extends around the JJM barge as well. White polysheeting can be seen in the foreground of the photo.

Photo 3. Naturally occurring sheen observed floating on surface of the water (yellow arrow points to sheet).

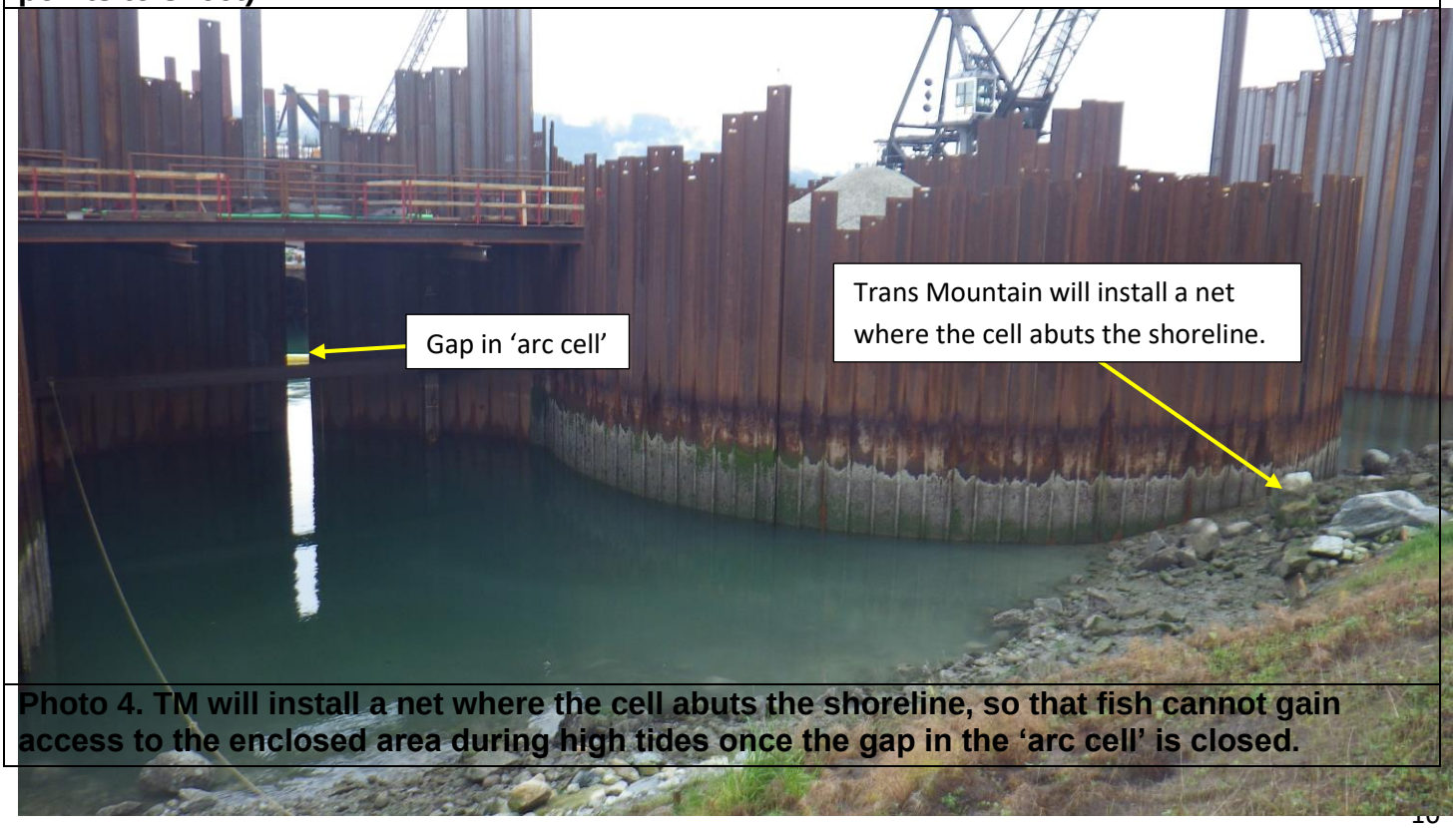

Photo 4. TM will install a net where the cell abuts the shoreline, so that fish cannot gain access to the enclosed area during high tides once the gap in the 'arc cell' is closed.

Photo 5. White concrete lock blocks (yellow arrow) placed along shoreline to avoid runoff into the marine environment from the area where concrete column mixing will occur.

Photo 6. Berm and sediment fence installed as additional measures to avoid runoff into the marine environment from the area where concrete column mixing will occur.