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Trans Mountain Expansion Project – Westridge Marine Terminal Visit

Date	2020-01-28	**Time on site**	9:15 am	**Time off site**	1:00 pm
DFO attendees	S. W. and W.B. (FFHPP); T.G. (C&P)				
IAMC attendees	One Indigenous Advisory and Monitoring Committee (IAMC) Indigenous Monitor (J.H)				

On-site contractor/equipment	**Role**
Trans Mountain	Site Management
KLTP	Prime construction contractor
Hemmera	Underwater noise monitoring during vibratory pile driving
DB Columbia DB Olympia	Derrick barges (DB) Columbia and Olympia working in the nearshore on sheet pile cell 8 and arc 9a. Crews were using a clam shell bucket to dig out an obstruction that was preventing installation of sheet piles at cell 8; turbidity curtain and water quality monitoring conducted during the work and a fish salvage will be repeated within cell 8 once it is fully isolated.
DB General DB Burrard	DB General working offshore on breasting dolphin (BD) piles 5 and 6. DB Burrard conducting preparatory works (welding) for construction of the superstructure.
DB Bremerton	DB Bremerton to start impact pile driving sheet piles associated with cell 3 shortly.

IAMC Indigenous Monitor Observations and Comments

I have no comments or concerns at this time.

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Time	Inspection Activity

0915	DFO and the IAMC Indigenous monitor met representatives at the KASK site including:
	• Kiewit-Ledcor Trans Mountain Partnership (KLTP)
	  ○ Environmental Manager [A.A]
	  ○ Project Manager – Marine [J.S]
	• Trans Mountain (TM)
	  ○ Chief Environmental Inspector [B.J]
	  ○ TM Environmental Inspector (TM EI [S.D])
	  ○ Regulatory Lead [K.M]
	  ○ Construction Manager [T.A]
	  ○ Indigenous Monitor [M.J]
	KLTP gave T.G. Health and Safety Orientation upon arrival.
	The TM EI provided an overview of on-going works at the WMT including:
	• Upland activities (road widening; western water treatment plant);
	• Onshore activities (deep soil mixing);
	• Nearshore/in-water (completed cell 3, working on cells 8 and arc cell 9a);
	• Offshore (template for breasting dolphin piles 5 and 6; loading platform cells).
	Other items discussed:
	• Works on temporary marine construction office to begin on March 1, 2020 and in-water works should take 1-2 weeks.
	• Impact pile driving of offshore piles is expected to recommence during the later part of the first week of February 2020.
	• TM confirmed that DFO and IAMC will receive a copy of the December 2019 construction monitoring report by the end of the week (i.e., January 31, 2020).
	• DFO followed-up on observations noted during the previous DFO site inspection and TM confirmed the following:
	  ○ a sorbent boom was installed along the shoreline during the remaining works to demolish the small utility dock (photo to be included in Trans Mountain's December 2019 construction monitoring report).
	  ○ the sediment fence near the deep soil mixing test hole was re-installed, as it was not keyed in properly (photo to be included in Trans Mountain's December 2019 construction monitoring report).

1025	Arrive at the Westridge Marine Terminal.
1025-1130	Walk along foreshore • observed upland works to construct western water treatment plant. Treatment plant will be commissioned this week. The TM EI indicated that works to increase the capacity of the eastern water treatment plant will occur in mid-February 2020. • observed new temporary flexi-float dock and gangway, which was recently installed following demolition of the small utility dock in late 2019 (Photo 1). To reduce erosion, the TM EI indicated that the foreshore near the new dock and gangway will be re-graded to a 2:1 slope and the white polysheeting currently covering the

	shoreline (Photo 2.) will be replaced with coco matting. The TM EI indicated that the flexi-float dock and gangway will be removed once the marine construction office is built, as the office's design includes a dock and gangway. • observed areas of turbid water located within the yellow turbidity curtain (Photo 3); curtain appears to be functioning as designed. The TM EI pointed to an area along the shoreline that will be replanted with coco matting as this may be the source of the turbid water. • observed a few creosote piles remaining in the nearshore following demolition of the small utility dock. The TM EI confirmed that the piles were too damaged to be removed at the time, but that the piles will be removed shortly. Observed sheen (likely creosote leaching from the piles) on the surface of the water. TM indicated that it would put sorbent rings around the piles to absorb creosote that leaches from the piles.
1130-1245	Visit to DB General • TM EI showed DFO the new hoses being installed on the bubble curtain rings (Photo 4) that are deployed during impact pile driving; the new hoses are lined with metal and are designed to not bend or kink and in turn, provide a consistent air supply to the rings. • KLTP provided DFO an overview of the new checklist that will be completed to verify functioning of the bubble curtains prior to impact pile driving. KLTP indicated that this checklist is included in the Offshore Impact Pile Driving Bubble Curtain Standard Operating Procedure. • DFO intended to observe the DB General conducting vibratory pile driving during the site visit, but pile driving was delayed.
1245-1300	Walk along foreshore • DFO and IAMC IM verified that the sediment fence that had not been keyed in properly during DFO's previous site inspection had in fact been re-installed. The TM EI also showed DFO and the IAMC IM that an additional sediment fence had been installed in the same area to further enhance sediment and erosion control.

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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.
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
N/A
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 observed a screened water pump in operation at sheet pile cell 3.
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
No fish salvage activities were occurring at the time of 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 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.
☐ Compliant ☐ Non-compliant ☐ Not observed/unknown ☒ Not applicable
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.
☐ 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
Marine Mammal Monitoring
2.2.9.6 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
2.2.9.7 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
2.2.9.8 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
2.2.9.9 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 2.2.9.6 to 2.2.9.8 will need to be complied with within this new exclusion zone.			
☐ Compliant	☐ Non-compliant	☐ Not observed/unknown	☒ Not applicable
2.2.9.10 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			
No fish salvage activities were occurring at the time of 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
No material was being excavated at the time of the site inspection.
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 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 turbidity curtain or adversely affect the integrity 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 attaches to the foreshore. Another turbidity curtain is in place around the western foreshore area (e.g., around gangway and flexi-float dock.
Action Items
N/A

Additional comments or action items
N/A

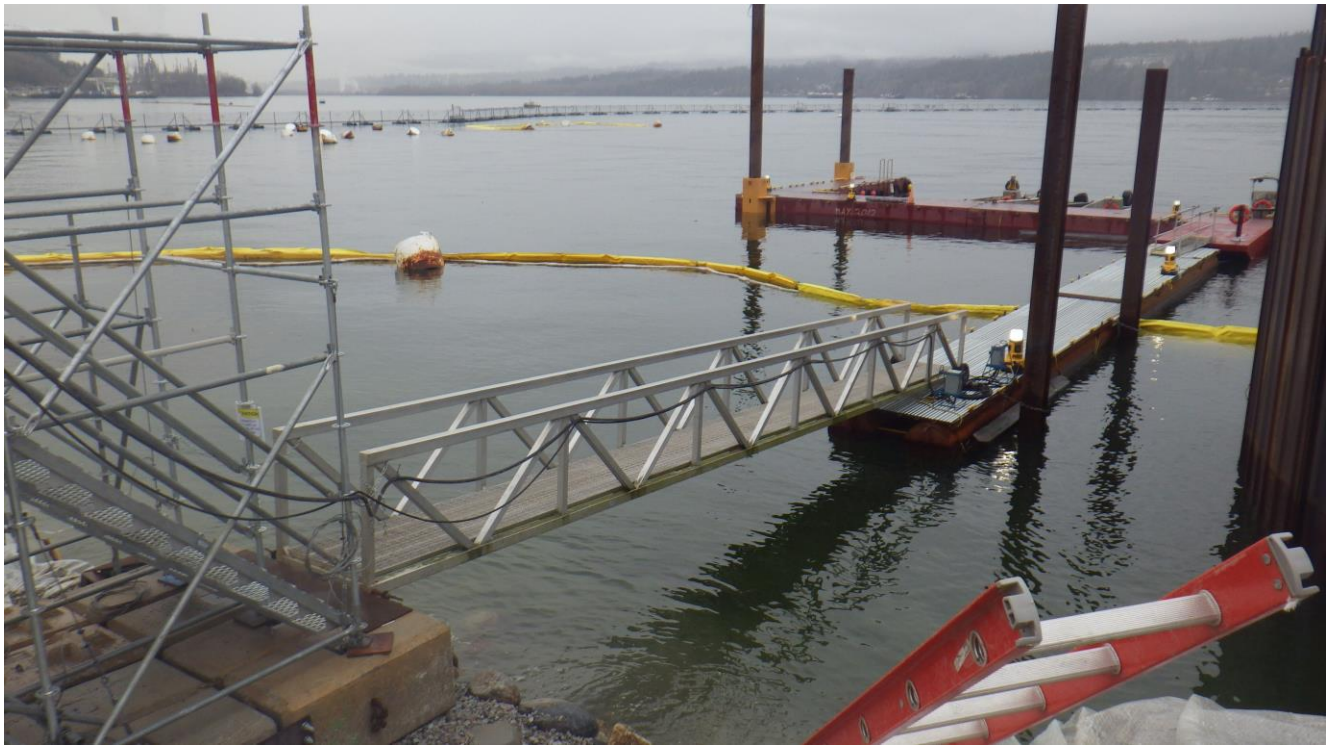

Photo 1. Gangway and flexi-float dock constructed to replace small utility dock and will be removed after marine construction office is built.

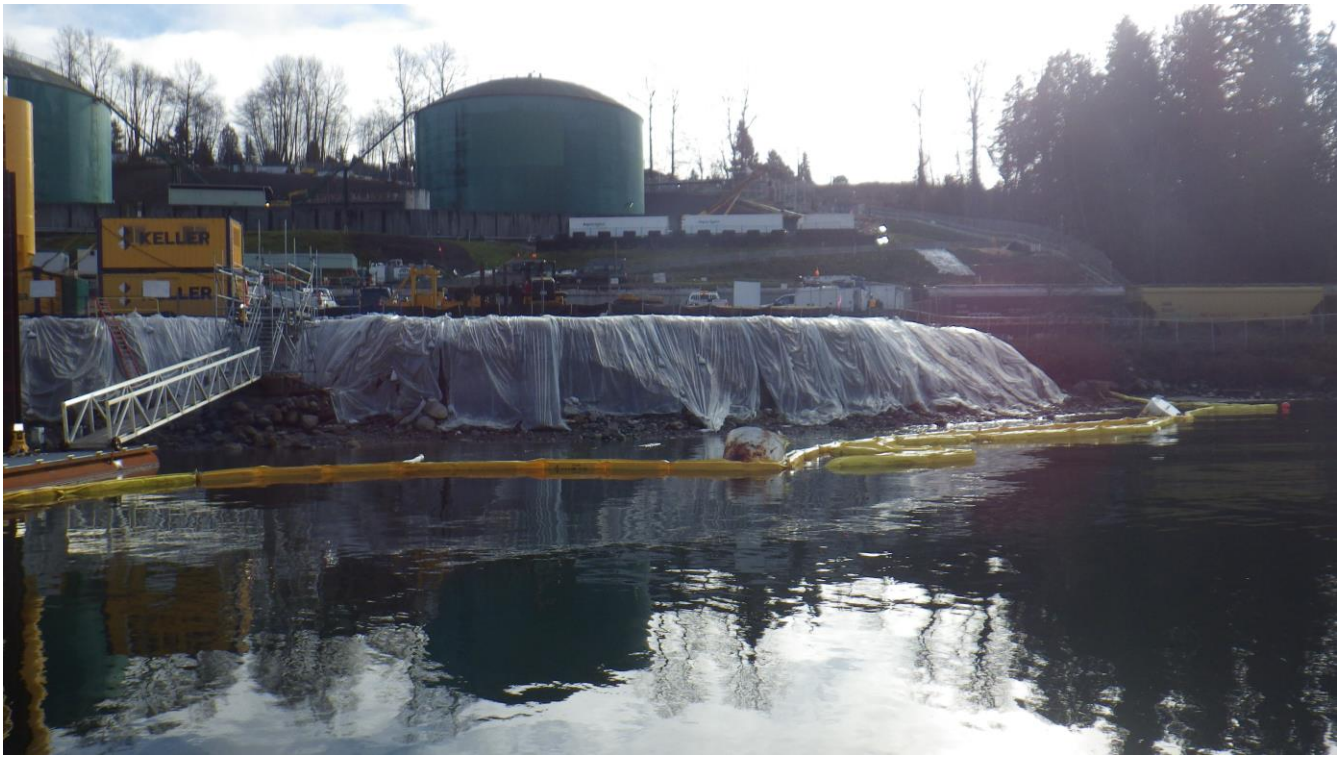

Photo 2. Polysheeting that will be replaced with coco matting to reduce erosion.

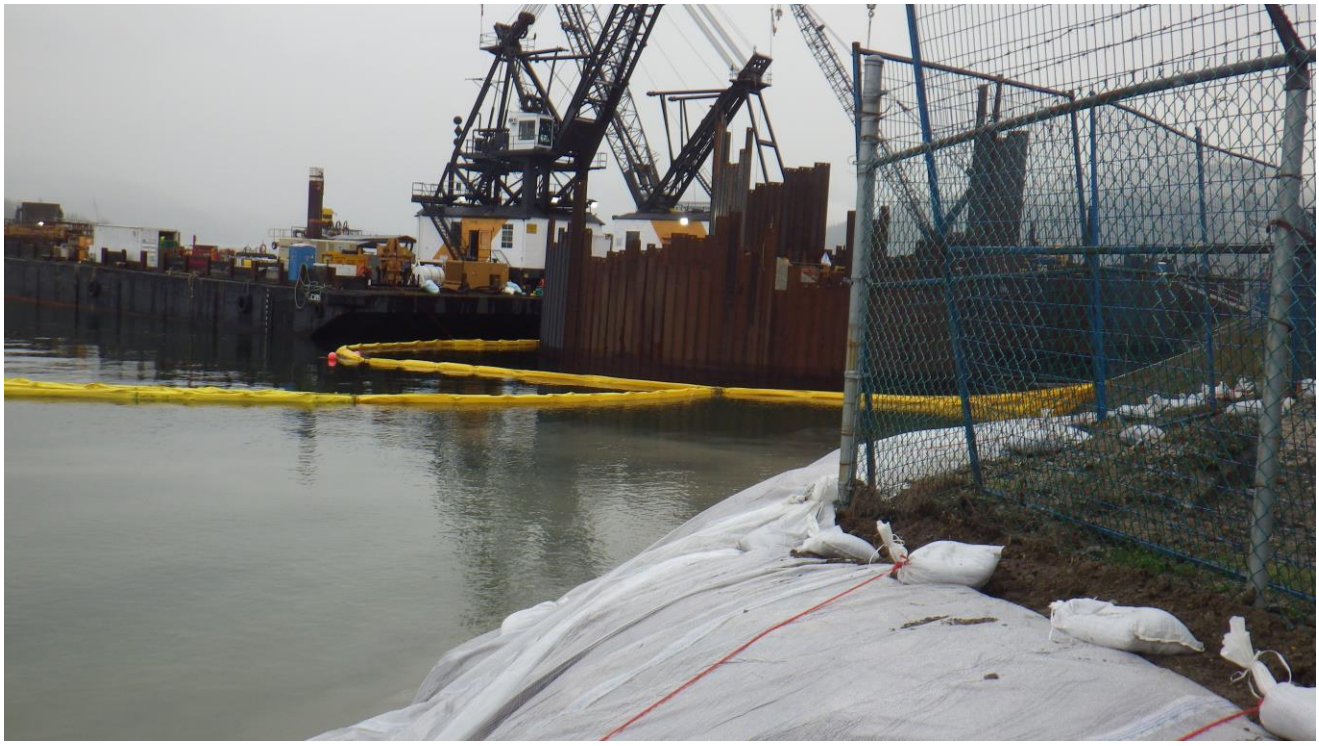

Photo 3. Turbid water being contained by turbidity curtain.

Photo 4. New hoses on bubble curtain rings.