



Highway 91/17 Upgrade Project

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REVISION LOG

Version #	Date	Revised By	Approved By	Revised Section
0	08 July 2021	Nuzhat Beig, Meng, EIT	Patty Burt, RP Bio, AQP	
1	09 July 2021	Patty Burt, RP Bio, AQP	Werner Beukes, RP Bio	Section 2.1: minor edits to activities Section 2.2: Provided by PGC Table 1 Item 83: tense was updated to reflect works being done. Section 4.7: Updated the fish salvage results and included in Appendix 3. Section 4.9: Details about the PGC delivering empty aerosol paint cans to the Surrey waste transfer station- Recycling depot. Section 4.11: Receipt of the AiP.
2	28 July 2021	Werner Beukes, RP Bio		Non Conformance nr 49 has been added to section 3.3

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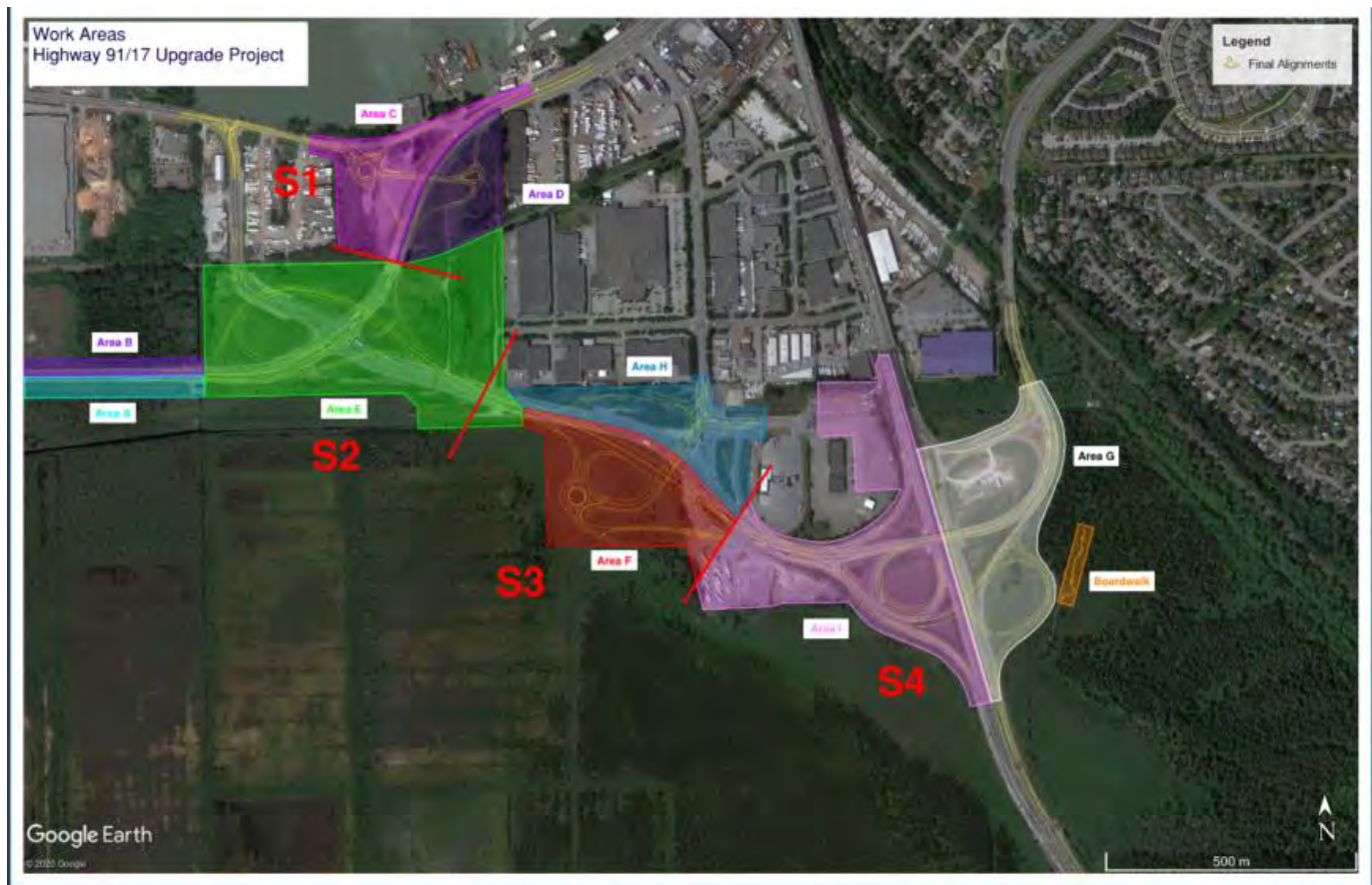
Appendices

- Appendix 1** Key Plan Drawing
- Appendix 2** Spill and Incident Tracker
- Appendix 3** Wildlife/Fish Salvage Results
- Appendix 4** Permit Tracker
- Appendix 5** Permit Conditions Tracker
- Appendix 6** Status of TOCA Commitments Table
- Appendix 7** Water Quality Data
- Appendix 8** Toolbox Training Records
- Appendix 9:** Incident Reports-Including Spills over 5 L

1.0 INTRODUCTION

This report covers all construction activities that had occurred from 01 to 30 June 2021 on the Highway 91/17 Upgrades project. During this period works occurred in Areas C, E, F, G, H, and I. For the purposes of this report, the following areas shall be defined as:

- Area C: Portion of River Road West of Highway 17 (Includes L250, L275, L325, L350, part of L375)
- Area E: Sunbury Mounds L500, L575 and L550
- Area F: MK Delta (L1150S/1160/1170/1400) and C01 detour
- Area G: Delta Nature Reserve (L2300/2400)
- Area H: L1300 Weigh Scale
- Area I: West side of Hwy 91, truck parking area, E02 and E04 Detour (L2100/L2200/L600E and W)



- A Key Plan has been included showing the project alignments (See **Appendix 1**).

2.0 CONSTRUCTION ACTIVITIES

2.1 Activities for this Period

The following works took place within Section 1 from 01 to 30 June 2021 with representative photos from 1 to 9 in Section 7:

Area C

- As-built surveys of Hwy 17.
- L250 roundabout paved, 2 CBs and their leads placed, 1st and 2nd lift of gravel placed for building the ramp to access the stored topsoil.
- L275 - Placed 3 lifts of gravels and placed lift under crash attenuator at the L100/L275 intersection.
- L325 - Pile driving GS 46 and installing the rebar for concrete pour for the base of GS 50. Tellus lines on River Road spliced.
- L350 – Preload (gravel) removal from the intersection of River Rd and 96th St.
- Jacob Brothers continue with installing deck rebar placing MSE wall copings on North Wall of S1 Bridge.

The following works took place within Section 2 from 01 to 30 June 2021 with representative photos from 10 to 17 in Section 7:

Area A

- No works in Area A.

Area B

- No works in Area B.

Area E

- CBs and leads installed along L500/575.
- Stone columns completed.
- L100 – Excavation completed for water monitoring well.
- L100N – Sand placed on preload stage 3.
- L500 – Silt fences in Sunbury Mounds on SW corner of S2 intersection installed, extra lock blocks removed to the truck parking lot.
- L550W - Monitoring well installed at stockpile area, excavation to decommission old ground water wells in progress.
- L500N – Shoulder widening, and gravel touch ups done.
- L575 96th St and Hwy 17 North spans completed, wires installed across Hwy 17 North Span and Hwy 17 South span installed.
- TWE worked on poles and Hwy 17S Span, completed Hwy 91C Steel Span wire.

Hwy 99

- Works at Hwy 99 have been completed.

The following works took place in Section 3 from 01 to 30 June 2021 with representative photos from 18 to 22 and 25 in Section 7:

Area F

- L500 - Gravels along preplaced fills mined, existing sand was graded, compacted, and tested.
- L508 - Placed sand preload and geogrid.
- L575/L500 – Subgrade preparations, conducted CPT testing and removed/maintained the spoil pile
- L1150 sand imported and stockpiled for later use.
- L1170 - Toe berm installation ongoing. Filled in the area of the berm that could not be touched due to the bird's nest at the west of the roundabout. Touching up the top of the berm that was being built and hauled sand from the truck parking lot to L100.

- L600: Placed sand, installed 3 settlement gauges and 1 additional riser on all 3 gauges.

Area H

- Old bridge signs removed. Backfilling of existing old truck parking access completed and existing asphalt around the area removed.
- L1300 subgrade excavation continued, geogrid exposed, placement of additional geotextiles and biaxial grid for reinforced pavement structure. 2 CBs placed and backfilled.
- STM 300 – Pipe installation.
- L500 – Preload placement, detour C03 grading completed, Geogrids placed, and sand stockpiled.
- L500N, L1140 – Packing and placing of sand continued

The following works took place in Section 4 from 01 to 30 June 2021 with representative photos from 23 and 24, 26 to 30 in Section 7:

Area I

- L600W – 2 lifts of sand placed. Fill and sand placed, built up north ramp. Excavated for Menard's crane pad. Pulling out peat material stockpiled at exit 8 to haul to S3-L1400
- LBW407- 25th row of baskets, middle embankment and bottom bench placed
- L2200 – concrete sidewalk and curb partially removed. Placement of gravel, barriers, and reflectors to the end of currently paved areas. Surplus sand moved to Exit 8. Excavated millings, road gravel and stockpile at top end on the grade. Hauled asphalt chunks to E01.

Area G

- L600E - Stone Columns installed, preload placed, and asphalt removed from E02 ramp.
- L2300, L2500 – Sand preload placed
- L2200 - Millings excavation in progress.

New Truckstop

- No works at the New Truckstop.

2.2 Upcoming Activities

Section 1:

S1 bridge decking and rebar installations to continue.

L375- Completion of sidewalks and medians. Complete truck aprons and line painting

L275- Completion of guide sign installations. Complete fine grading and prime coat. Line marking to be completed.

L325/L350- Completion of electrical services relocations by TWE. Surface mill and overlay. Install permanent barrier. Line painting at River Road tie-in. Completion of bioswale and spillways. Ditching and Topsoiling.

L250- Sawcut and asphalt removal. Placement of well graded base. Ditching and completion of street lighting. Fine grade and basecourse placement.

Section 2:

C03 detour-. Install fine grade and base course.

L575- Install permanent barriers, spillways, and line painting. Install temporary rails at Wall S210.

L500 mill and overlay tie in. Add shouldering material and surface course layer. Remove cantilevers, asphalt and barriers. Start with the Sunbury/Hwy 17 Crossing. Menard to mobilize and start with stone columns (Sunbury West)

L100/L400 North Embankment and Preload Placement

Section 3:

Settlement period. No activities planned for July 2021

Section 4:

L600W demobilization of Menard stone column operation. Complete embankment fill and temporary lock block wall (406)

3.0 ENVIRONMENTAL ISSUES

3.1 Environmental Incidents

09 June 2021: A killdeer nest was found near L1170 in Area F, a buffer zone was installed to protect the nest (Photo 31).

On 16 June 2021: a small fuel leak from a backhoe occurred at L325. It is estimated that approximately 1 L of diesel was spilled, and this was caused by a mechanical failure. Surface run-off was contained, and all surface spills were removed by using absorbent pads. A mechanic was called out to the site and the repairs were done on the fuel supply system.

On 16 June 2021: a small hydraulic spill of approximately 2 L occurred at L325 when a mechanical failure occurred on an excavator. The spill was mostly on asphalt and all surface run-off was contained with absorbent pads and interlockable boom socks. All contaminated soils were removed and taken to the PGC Hazardous waste management area. A mechanic was called to the site to repair the mechanical failure.

On 22 June 2021: A zoom boom spilled hydraulic fluid at the L2200 Menard work site. The main cause of the spill was mechanical failure. The zoom boom was removed and repaired off-site. The estimated release was estimated to be less than 1L and was cleaned up accordingly.

3.2 Non-Compliance

No reportable Non-Compliance for this reporting period.

3.3 Non-Conformance

8 June 2021: NCR49-PGC noticed that two Groundwater Monitoring Wells (MW13-15 & MW13-16) were damaged during recent construction activities in Section 2 L550. These wells were not decommissioned as stipulated under the guidance of a Contaminated Sites QEP. PGC has since undertaken considerable effort to find the remaining 1-inch well casings. It is the opinion of the PGC QEP that, both shallow well installations at MW13-15 and 16 were fully excavated, and approximately the bottom ~2 m of 1 inch PVC well screen would remain in situ. This assumes that the 1-inch PVC casing was sheared off at the final excavation depth. It is entirely possible that the remaining 1-inch PVC well screen was 'pulled' out during the utility installation program and associated excavation activities (as it would have been held in place by only filter sand), as PGC re-excavated the area(s) in search of the deep wells and could not locate them. Alternatively, if the well casing remains in-situ, it is also possible that the remaining 1-inch PVC well screen would either have been damaged or filled / sealed by the surrounding soils by scouring / scraping of the excavation bucket during soil removal. Therefore, based on the information reviewed by a subject matter expert from the QEP, the risk of the remaining of PVC casings potentially left in-situ to continue to act as preferential pathway to the underlying sand aquifer is considered low and can be left as is. NCR49 was successfully closed.

22 June 2021: An unreported spill was discovered at a Menard site (L2200). The spill was discovered by PGC in the morning and Menard has been contacted in this regard. Upon further investigation it was found that the spill was caused by the mechanical failure on a haul truck delivering gravel. The spill cleanup was done by PGC and it is estimated that the total volume of release was approximately 5L (Photo 30). An environmental incident report (034) can be found in **Appendix 9** and has been submitted to MoTI.

3.4 Opportunities for Improvement

Toolbox training is staying relevant with the activities on site. Construction Superintendents are being reminded that works in and around environmentally sensitive areas require the presence of an AQP.

3.5 Outstanding Environmental Issues

The following ongoing monitoring is being conducted (**Table 1**):

Table 1: Environmental Issues Tracking Table

Item No	Date 2021	Environmental Issue or Required Action	Corrective Action	Projected Closure Date	Open/ Closed	Comments
83	14-April	L1170. It was observed by the Province representative that placed preload sand has migrated from the embankment fill to the toe of the slope. Water was mixing with the sand and providing the opportunity for Mineralization	NCR 0043 was raised. PGC has commenced with work to remove sand from the toe of the slope with a long reach excavator and the placement of bog peat on the embankment slopes for stabilization.	21 June 21	Closed	Work was initiated to remove sand from the toe of the slope and to complete the placement of peat on the sides of the embankment fill.
87	8-June	Openings to the storm drain in this area (L550) adjacent to the uncovered portions of the piles and the water within is potentially contaminated.	PGC to determine if the water is in fact contaminated	21-June 21	Closed	PGC has collected water samples and send to lab for analysis.
88	8-June	An excavator parked within the south side of the L2300 loop (by the E01 pond) appeared to have been under repairs, but large globs of grease could be seen under the boom. There were also no drip trays under the excavator.	No repairs to equipment to occur without a drip try. Grease to be removed from site asap and taken to the hazardous waste management area.	21-June 21	Closed	Grease removed and drip tray placed under the excavator. Mechanic will repair the excavator shortly.
90	8-June	Damage to fencing along the truck parking area. The fencing holds animals off the highway at this location	PGC will investigate the finding to determine if this was in fact related to the project.	21-June 21	Closed	PGC to investigate if fence was damaged by the project.
95	8-June	Knotweed sprouts could be seen in the L575 area	All Japanese Knotweed findings	21-June 21	Closed	PGC to schedule follow up treatments with

			to be reported to the PGC Enviro staff. Chemical treatment of additional Japanese Knotweed plants to be conducted.			Diamond head, planned for July 2021.
96	8-June	Water can be seen at the base of the sand in the L2300 area G. This water is likely to be mineralized from its interaction with the sand and appears to flow over the geo-liner towards the DNR.	PGC to go to site and determine what to do over here.	21-June 21	Closed	PGC to investigate

4.0 ENVIRONMENTAL MONITORING AND INSPECTION RESULTS

Daily site inspections were held during the reporting period by PGC (a representative was available during the day and night shift, as applicable). PGC also conducted to a Toolbox Meeting during the reporting period to highlight use of drip trays and working within the *Project Boundaries* (see **Appendix 8**). All operators and equipment were visited/inspected numerous times during the reporting period to ensure that all BMPs are being followed.

MESL conducted a field visit on the morning of 2, 8, 16, 21 & 30 June 2021 and coordinated with the PGC Environmental Manager and MESL Construction Inspector to get a brief on the current site activities. PGC has indicated that all equipment is checked prior to arriving onsite to ensure that it is free of excess grease, leaks, and foreign materials. Machinery and equipment are also inspected regularly to ensure they are equipped with a spill kit, spill tray and fire extinguisher, with deficiencies corrected immediately. Inspection results are kept on record by PGC.

4.1 Air Quality and Dust Control

Water trucks are onsite and are put into use during drier periods for dust suppression (Photo 32). No issues were recorded during the month of June. Toolbox training focused on *Dust and Air Quality Controls* **Appendix 8**.

4.2 Noise and Vibration Management

Monthly noise monitoring was conducted over a 24-hour period on 17 June 2021 results are in **Table 2** below. All recorded noise levels were below the baseline data.

Grey shaded: New revised baseline data (PGC letter Rev01 PGC-COR-000174 to MoTI - dated April 28, 2021)

Green shaded: Noise monitoring data not exceeding 15% of the baseline data

Yellow shaded (not used): Noise monitoring data is between 15%-30% of the baseline data

Red shaded (not used): Noise monitoring data exceeds 30% of the baseline data

Table 2. Monthly Noise Monitoring Data.

Start time	Location	Description	Ambient noise	GPS, Lat Long	BASELINE (Night)			RESULTS (Night) 17June		
					Avg. (dB)	Min. (dB)	Max. (dB)	Avg. (dB)	Min. (dB)	Max. (dB)
21:24:00	6	Nordel Way North (Section 4)	Normal traffic-construction activities nearby	49°8'52.50"N; 122°56'34.89"W	68.1	64.7	73.9	55	50.6	60.5
21:48:00	3	Nordel Way Bog Area (Section 3)	No activities in Area F. Traffic passing by on Hwy 91C and nearby construction	49°8'51.32"N; 122°56'55.53"W	74.8	66.9	85.8	60.2	50.6	75.8
					BASELINE (Day)			RESULTS (Day) 17 June		

14:00	1	River Road West (Section 1)	Active construction, passing cars, and workers using a hand tools was identified at the time of the monitoring.	49°9'9.58"N; 122°57'6.55"W	68.1	64.7	73.9	51.1	48.4	56.5
14:45	3	Nordel Way Bog Area (Section 3)	Nearby highway was identified at the time of the monitoring.	49°8'51.32"N; 122°56'55.53"W	74.8	66.9	85.8	61.3	51	75.6

4.3 Erosion and Sediment Control

Daily monitoring is done by PGC Environmental Representatives, Site Supervisors, and Foreman to ensure the installed sediment fences are fully functional in affected areas. Sediment control fences have been installed in active areas to prevent sediment run-off from clearing and grubbing activities in addition to containment of preload, stockpiles, and isolation of wildlife. Silt fencing has been kept in place and maintained to deter salvaged wildlife from reentering active construction areas.

Paved surfaces were observed in overall clean condition and TSI has been routinely observed at the site actively sweeping public roadways during night shifts. PGC has indicated that paved surfaces are also swept at the end of each night shift. Most areas were relatively stable having been covered with preload sand which was generally absorbed the erosive forces of the rain and they drain well.

4.4 Water Quality Management

Water monitoring was conducted in Silda Ditch during low tide to investigate if tidal influence makes a difference in the turbidity of water in this ditch (tide tables in **Appendix 7**). Water collected in Silda Ditch was observed to be high in turbidity but still within the background conditions previously observed in the ditch at this location. Additional water sampling was completed in the surrounding ditches which discharge into Silda ditch upstream. Normal turbidity readings were observed in these locations.

The EM did a thorough inspection of the length of the ditch during week 2 and discovered a fish screen covered in organic matter and woody debris. This may have caused water to back up and potentially trap sediment up stream. The fish screen was cleaned, and additional water sampling was done on 16 June 2021 in Silda Ditch Off site, labeled (Silda Ditch 1) and was observed to have lower turbidity than the previous week after cleaning the fish screen. PGC will continue to monitor the fish screen on site and the upstream locations to determine if the plugged fish screen was the source of the high turbidity water.

Water collected in Area G was found to be within the normal parameters for the area and no signs of mineralization have been observed in the bog water samples. The samples sites in Area G are beginning to dry out and have low levels of water both on site and in the bog.

A small ammendment has been made to the monitoring location names for future report

New location names for Silda Ditch water monitoring stations

Old Name:	New Name:
Silda Ditch Upper Upstream	Silda Ditch Upstream (US)
Silda Ditch Upstream	Silda Ditch Midstream (MS)



Figure 2: Current water sampling locations

4.5 Wildlife and Habitat Management

Wildlife salvage permit SU21-622077 was received on 28 June 2021. Wildlife fencing has been secured in preparation of salvage activities in Section 2. Traps were set over a two-day period starting 30 June 2021 with them being in operation on 03 July 2021.

The Kildeer nest that was found 08 June 2021 at the preload slopes (L1170) had a 30 m demarcation installed around the nest with delineators and danger tape to prevent disturbance to the nest. During this reporting period the nest has been abandoned and no signs of fledglings or egg fragments could be found. Toolbox training on *Birds and Bats Awareness* was conducted (**Appendix 8**).

The active barn swallow nest discovered in a stationary water truck at the L1160 is being monitored for activity and the nest is still under protection (Photo 33). Amphibians continue to emerge from ponded waters on the northwest side of the L2300 loop (Photo 34). There are no construction activities occurring in this area and the PGC Environmental Field Coordinators will continue to monitor.

4.6 Vegetation Management.

Emergent of Japanese knotweed continues to be monitored, with new plants identified at L575 on 8 June 2021. Diamond Head was contacted to schedule herbicide treatment in this area for July 2021.

4.7 Fisheries Habitat Management

A fish salvage was conducted on 09 June 2021 at L2250, resulting in the capture and successful relocation of 3 - Three-spined Stickleback (*Gasterosteus aculeatus*), 3 - Northwestern salamanders (*Ambystoma gracile*) and one unidentified amphibian tadpole (**Appendix 3**).

Wildlife were captured during this fish salvage effort while the wildlife salvage permit SU21-622077 was still under review but 'as bycatch under Condition 3 of a fish salvage permit which is held by an AQP, those non-fish and non-listed (red or blue listed) species were carefully returned to immediately adjacent suitable habitat (i.e. not translocated over kms or hours) outside of the area of construction.

4.8 Concrete Works and Grouting Management

Jacob Brothers (PGC sub-contractor) has been observed following to steps that were outlined in the recent toolbox training and are adhering to the correct protocols for handling of concrete waste and wastewater. All concrete trucks are washed off site and all concrete mixes that do not meet the specified criteria are removed from site by the service provider. Concrete work and grouting continued at S1 Bridge; no problems were encountered.

4.9 Waste Management

Yellow wheelie bins were readily available and fully stocked at each active work location while mobile equipment was also equipped with spill kits. PGC has provided checklists based on the CEMP (Rev 6) and ensures that any depleted supplies within these bins are restocked immediately (as per the inventory posted on the inside of the lid).

It is MESL understanding that mobile equipment is frequently moved, but extra drip trays have been observed in equipment storage locations. Crews are being reminded that drip trays are readily available should they encounter a piece of equipment that is missing one. Toolbox Training in this month focused on *spill trays usage* (**Appendix 8**). There has been an overall improvement and awareness on site with regards the use of drip trays.

Tervita was onsite 24 June 2021 to remove oily containers, used spill pads, and contaminated soils. PGC has removed all empty aerosol paint cans to the Surrey waste transfer station-Recycling depot.

Table 3: Hazardous Waste Storage and Disposal Tracking

Dates (2020/21)	Location	Haz-Material Stored	Volume m ³	Comments	Date of Disposal
13 July 20	PGC Site Office Yard	Spent Absorbents	N/A	Approximately 2-3 L of diesel was spilt on the pavement. Spent absorbents to be collected by Tervita	24 September 2020-3 barrels
28 July 20	L575 Pre-load Area	Spent Absorbents	N/A	Less than 1 L of oil to spill tray, absorbent pads used to mitigate spill to ground. Spent absorbent pads to be collected by Tervita.	24 September 2020-3 barrels
17 Sept 20	Burns Bog perimeter ditch	Spent Absorbents	N/A	~100 mL of engine oil to water. Spent absorbent pads to be collected by Tervita.	24 September 2020-3 barrels
21 Sept 20	Site office waste area	Spent Absorbents	N/A	Excess pads that were placed in spill trays. Spent absorbent pads to be collected by Tervita.	24 September 2020-3 barrels
24 Sept 20	Site office waste area	Spent Absorbents	N/A	Excess pads that were placed in spill trays. Spent absorbent pads to be collected by Tervita.	24 September 2020-3 barrels

24 Sept 20	Site office waste area	Used aerosols	N/A	Spray paint cans that had collected to date.	24 September 2020-3/4 of a bin
25 Oct 20	PGC Site Office Yard	Used aerosol paint cans, contaminated soil, and plastic oil containers.	55 m ³	Spray paint cans that had collected to date, damaged drum with the soil and empty containers.	25 October 2020-
3 Nov 20	Site office waste area	Wood waste bin	N/A	Pallets and other wood by-products	03 November 2020
2 Dec 20	Site office waste area	Spent absorbents, drum contaminated soil, plastic oil containers, bags with contaminated soil.	1.7 m ³	Used spill response materials and contaminated soils.	02 December 2020
11 Feb 21	PGC Site Office Yard	Used spill pads, used aerosols, oily plastics, and contaminated soil	N/A	Aerosols taken to recycling depot by PGC, spill pads, oily plastic and soil removed from site by Tervita	11 February 2020
21 March 21	PGC Site Office Yard	Hazardous Waste	N/A	All hazardous waste was removed from the site by Tervita: manifest #BC064745-5	21 March 2021
24 June 21	PGC Site Office Yard	Used spill pads, used aerosols and contaminated soil	150 kg, 0.35 m ³ & 1500 kg	All hazardous waste was removed from the site by Tervita. Aerosol paint cans were taken by PGC to the Surrey Waste Transfer Station for recycling	24 June 2021

4.10 Emergency Response

No emergency responses were recorded during this reporting period.

4.11 Contaminated Sites Management

Poly sheeting is being used and monitored when covering and placement of confirmed contaminated soils. PGC has received the Application in Principle (AiP) Approval (30 June 2021) from the Ministry of Environment and Climate Change and plans are currently underway to dispose of contaminated stockpiles as per the stipulated requirements.

Table 4: Contaminated Sites Tracking

Date	Soil	Water
Section 1		
Section 2		
		Water treatment plant for the STM 230 & 330 will be demobilized 4 July when all storm water excavations have been completed. Weekly water samples were analyzed from May 28 onwards to ensure the systems compliance in accordance with BC CSR discharge standards.
Section 3		
Section 4		

5.0 ENVIRONMENTAL PERMITS

5.1 Status Update

A Permit Tracker is provided in **Appendix 4**. Renewal of the FLNRORD wildlife salvage permit was obtained on 28 June 2021. Obtained the AiP from the Ministry of Environment and Climate Change Strategies on 30 June 2021 for the contaminated handling of material in Section 1 & 2.

A Permit Conditions Tracker is included as **Appendix 5** outlining all DFO and WSA permit terms and conditions.

5.2 Status of the Table of Commitments and Assurances

The status of completed and ongoing commitments in the Table of Commitments and Assurances is provided in **Appendix 6**.

6.0 CONCLUDING REMARKS

During a recent MoTI site visit a few deficiencies were noted. Immediate action was taken by PGC and many of the issues were closed in a timely fashion. Some other items require further investigation and will be closed out by PGC during follow up reporting periods. PGC continues to issue an internal tracking list that is related to the respective sections. This will provide information pertaining to all open issues on the respective work fronts. When new issues are highlighted this list and remaining pending items will be sent to each section's site superintendent for action. PGC has observed that this is an effective way to highlight open items to the responsible people on site.

7.0 SITE PHOTOS



Photo 1. L275 (C). Paving of L275 offramp.



Photo 2. L275 (C). Bridge construction.

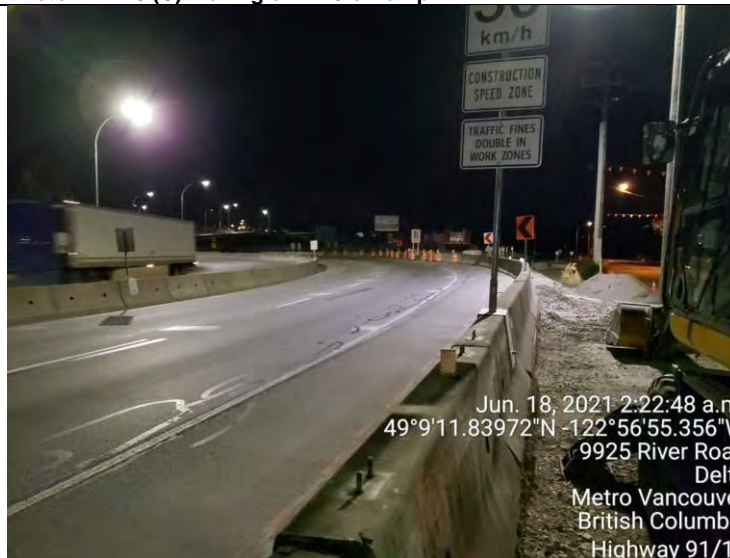


Photo 3. L275 (C). Relocation of barriers.

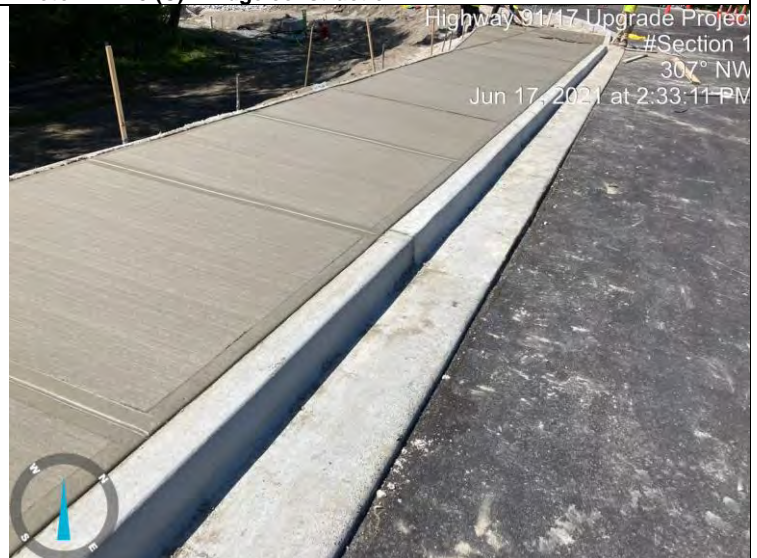


Photo 4. L350 (C). Sidewalk west of S1 roundabout.



Photo 5 L275 (C). Paving and widening work.

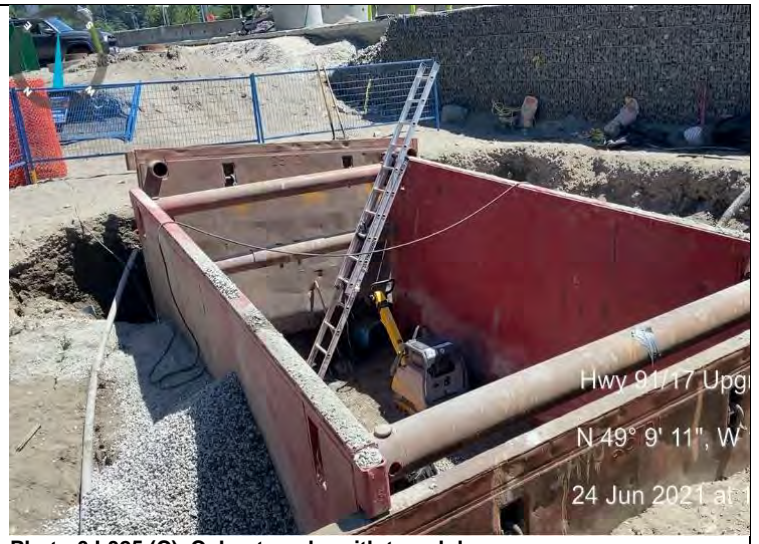


Photo 6 L325 (C). Culvert works with trench box.



Photo 7. S1 Bridge (C). Rebar installation.



Photo 8. L250 (C). Paving the roundabout.



Photo 9. L350 (C). Vibration monitoring for pile driving during guide sign installations.



Photo 10. L575 (E). Suspect contaminated soil covered in poly.



Photo 11. L575 (E). Placing STM 225 & 330.



Photo 12. L575 (E). Placing final grade gravel.



Photo 13. L500 (E). Installed catchbasin.



Photo 14. L575/500 (E). Gravel placement and dust suppression.

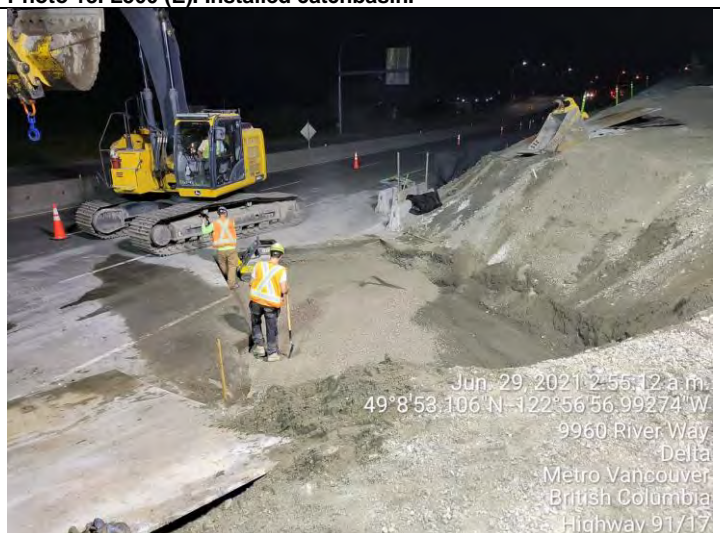


Photo 15. L500 (E). Catchbasin installation.

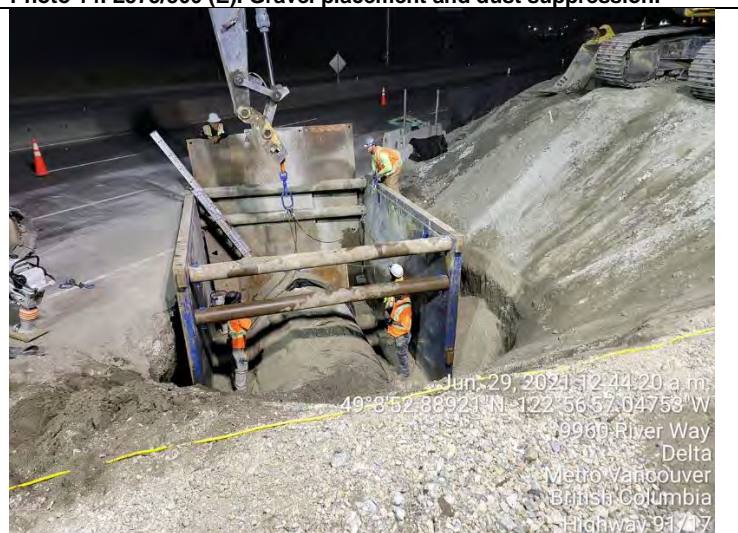


Photo 16. L500 (E). Catchbasin and permanent stormwater structure installation.



Photo 17. L575 (E). Example of fine grading.



Photo 18. L500(E). Placement of preload sand lifts.



Photo 19. L1170 (F). Parked equipment with spill tray properly in use.



Photo 20. L500 (F). Greenbelt placing sand.

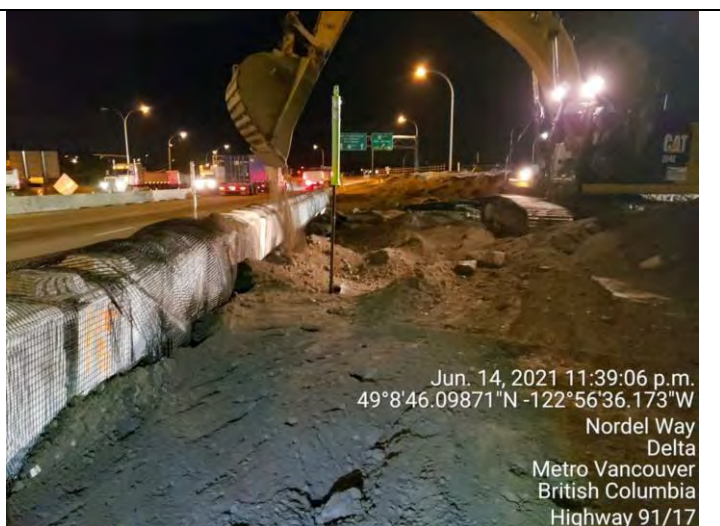


Photo 21. L508 (F). Placement of preload and geogrid.



Photo 22. L1170 (F). Peat berm added to the bottom of sand slope.



Photo 23. L1170 (F). Peat berm placement completed.

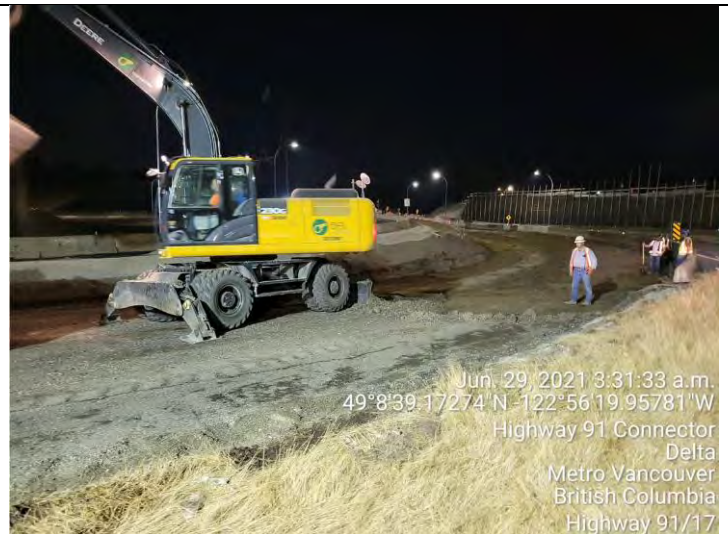


Photo 24: L2200 (G). Excavating milled asphalt and road gravel.



Photo 25. L2400 (G). Inspection of ESC fences.



Photo 26. L600 (I). Placement of preload sand.



Photo 27. L2400 (I). L2200 asphalt placement.



Photo 28. L2200 (I). Testing and compaction.

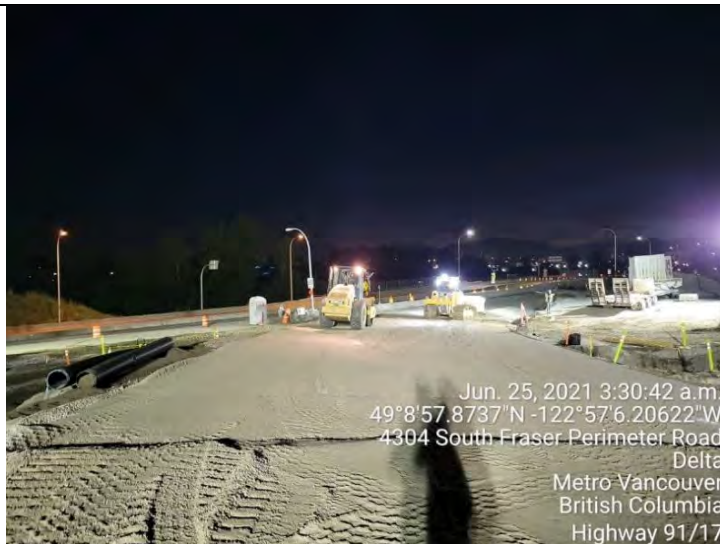


Photo 29. L600E (I). Sand placement.



Photo 30. L2200 (I). Hydraulic spill response.



Photo 31. L1170 (E). Killdeer nest flagged off.



Photo 32. Truckstop, truck parking lot wetted down for dust suppression



Photo 33. L1150 (F) Barn swallow nesting in water truck.

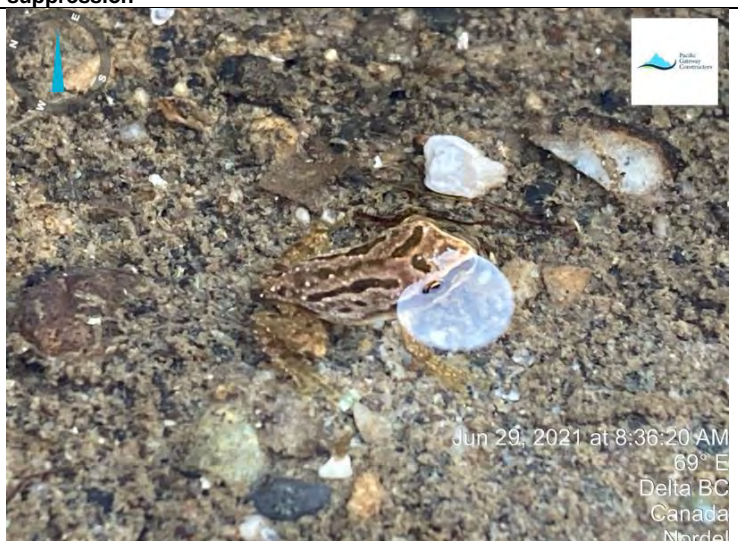
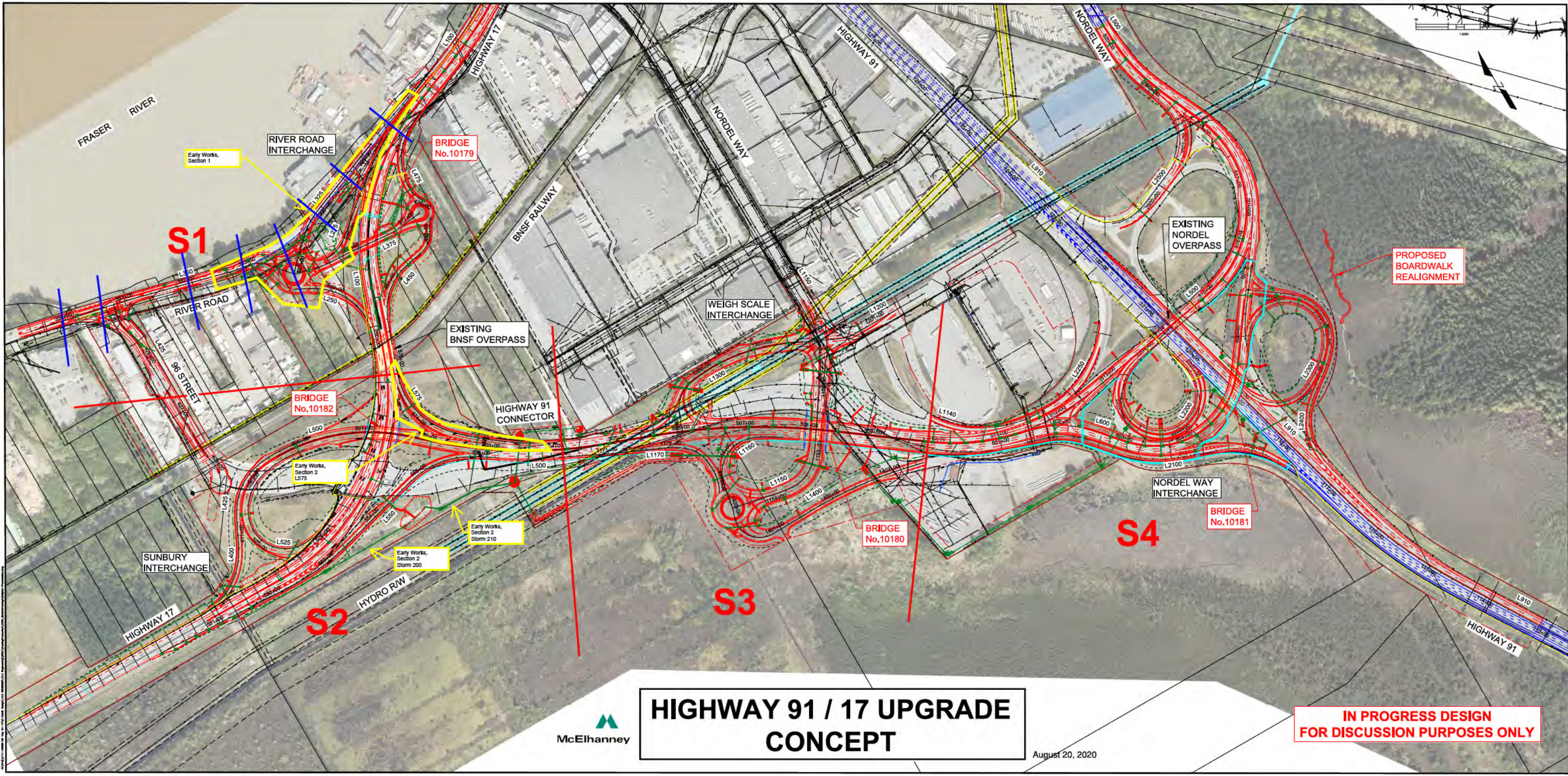


Photo 34. L2300 Loop (G) Amphibian observed and protected in ponded area.

APPENDIX 1: KEY PLAN DRAWING



**HIGHWAY 91 / 17 UPGRADE
CONCEPT**

August 20, 2020

**IN PROGRESS DESIGN
FOR DISCUSSION PURPOSES ONLY**

APPENDIX 2: SPILL AND INCIDENT TRACKER

HWY 91/17 SITE Environmental Spill and Incident Tracking																	
Incident #	Date Of Event	Date Reported	Date Initial Notification Issued	Shift	Approx. Time	Contractor	Sub-Contractor	Silo	Classification	Description of Event	Location	Fluid Amount (L)	Fluid Type	Type of Equipment	Causal Factors	Action Taken	Corrective Actions Date Complete
21	4-Jan-21	4-Jan-21	5-Jan-21	Night	20:31-21:00	PGC	Delta Aggregate		Minor spill (<1L)	Hydraulic line broke	S3 L1400	<500mL	Hydraulic fluid	Rock truck (Volvo T-13)	Normal wear and tear on moving machine parts (hydraulic line); unforeseen circumstances.	Leaking hydraulic line noticed during pre-shift inspection. Operator shut down the machine immediately and placed spill pads on the leak source and on the ground below the leak. Machine was parked with its box up how leak was found and in the locked position. A spill tray was placed below the leak, and contaminated pads and sand below were removed for disposal. Mechanic repaired the broken line in	5-Jan-21
22	6-Jan-21	6-Jan-21	6-Jan-21	Day	9:01-9:30	PGC			Minor spill (<1L)	Hydraulic line broke	S2 L500 preload	<500mL	Hydraulic fluid	Excavator (CAT 320E)	Normal wear and tear on moving machine parts (hydraulic line); unforeseen circumstances.	Leaking hydraulic line noticed on boom during operation. Operator shut down the machine immediately and placed spill pads on the leak source and on the ground below the leak. Machine was taken out of service, and a spill tray was placed below the leak. Contaminated pads and sand below were removed for disposal. Mechanic repaired the broken line	6-Jan-21
23	12-Jan-21	12-Jan-21		Night	00:01-00:30	PGC				Silty water released to 96th St ditch	S2 adjacent to 96th st ditch	unknown quantity of water	silty water		not following silt practices. No EM present. Working during heavy rain event	Work was immediately stopped and pumps turned off.	Jan 17 - EM will be present for operations to resume with a dewatering plan in place.
24	14-Jan-21	14-Jan-21	14-Jan-21	Day	14:31-15:00	PGC			Spill (1.1 L - 5L)	Hydraulic hose broke	S2 L500 preload	<5L	Hydraulic fluid	Dump truck	Normal wear and tear on moving machine parts (hydraulic line); unforeseen circumstances.	Hydraulic line burst while raising box of dump truck to offload sand. Machine was immediately turned off. Hydraulic fluid spilled onto machine and preload sand. Spill pads were applied to ground and machine. Contaminated sand that had absorbed oil was quickly removed and bagged for disposal. Oil was fully cleaned off	Trucking company took machine out of service and will complete repairs offsite.
25	10-Feb-21	10-Feb-21	11-Feb-21	Night	3:31-4:00	PGC	Nordel Trucking		Spill (1.1 L - 5L)	Tandem truck failed to lower box causing collision with bridge	Underside of the Nordel Way overpass	3-4L	Hydraulic fluid	Dump truck	Damage to the bridge and the fluid release	It is unclear at this point what immediate action was taken by the sub-contractor after the incident occurred. This incident is currently under investigation. The dayshift crew observed the spill on the asphalt and the road shoulder. A cleanup was initiated and approximately 2-3 m³ of contaminated soil was collected and placed into super sack bags. The bags were taken to the PGC waste management area and placed under polyethene plastic. The removal of the contaminated soil by the PGC service provider	Incident is currently under investigation
26	16-Feb-21	16-Feb-21	16-Feb-21	Night	11:01-11:30	PGC	Delta Aggregate		Minor spill (<1L)	Mechanical failure caused oil to spill into spill tray	L1400 pre-load	approx. 500ml	Engine oil	Rock truck (Volvo T-13)	Mechanical failure	At approximately 11:15 pm a small amount of engine oil spilled onto the placed preload sand. This was because of a mechanical failure of a stationary rock truck not in use. The oil was dripping into the drip tray and approximately 500 mm of oil was spilled on the preload surface.	Equipment maintenance
27	17-Feb-21	17-Feb-21	17-Feb-21	Day	8:31-9:00	PGC	Norland		Minor spill (<1L)	Mechanical failure caused hydraulic oil to spill into excavator bucket	L-550 culvert installation	approx. 500ml	Hydraulic fluid	Excavator (CAT 328D)	Mechanical failure	At approximately 8:57am a spill occurred during a bucket change on an excavator which resulted in less than 1L of hydraulic oil making contact with the ground. Luckily the excavator arm was above the bucket and the majority of the hydraulic oil dripped into the excavator bucket. Spill pads were immediately deployed,	The Excavator was repaired
28	23-Mar-21	23-Mar-21	23-Mar-21	Night	13:31-14:00	PGC	Norland		Large Spill (5.1L - 99 9L)	Mechanical failure caused hydraulic oil to spill into asphalt	L-2400 on the highway off ramp	approx. 10L	Hydraulic fluid	Haul truck	Mechanical failure	At approximately 13:45 a spill occurred when a dump truck was unloading sand for preload placement. The hydraulic oil spill released approximately 10L to the asphalt. Luckily the asphalt was covered in fine sand which absorbed the spilled material. Spill pads were immediately deployed, and the contaminated sand was excavated by hand bagged and stored on site for later disposal to an	The Dump truck was removed from site and sent to a facility for repairs
29	23-Mar-21	23-Mar-21	23-Mar-21	Night	21:31-22:00	PGC	Nordel Trucking		Spill (1.1 L - 5L)	Mechanical failure caused hydraulic oil to spill into asphalt	L-2400 on the highway off ramp	3-5 L	Hydraulic fluid	Haul truck	Mechanical failure	At approximately 21:45 a tandem truck was busy offloading preload sand- While lifting the load box a hydraulic line burst open causing approximately 3-5 L of hydraulic fluid to spill onto the asphalt area. Absorbent pads were placed at the spill area and all contaminated soils were removed. A hazardous waste pickup	The Dump truck was removed from site and sent to a facility for repairs
30	26-Mar-21	26-Mar-21	26-Mar-21	Day	16:01-16:30	PGC	Menard		Large Spill (5.1L - 99 9L)	Mechanical failure caused a diesel spill onto soil	L910 on the shoulder of the road	approx. 10-20 L	Diesel Fuel	Dump Truck	Mechanical failure	At approximately 16 00 a spill occurred when a dump truck drove off the road. The spill released approximately 20L of diesel to the ground. The spill did to affect the nearby waterway and the spill was contained to the immediate area. Menard immediately responded to the incident and contained the spill. Spill pads, booms and a drip tray were immediately deployed, and the contaminated soil was excavated with a hydro-vac and sent off site for disposal to an appropriate off-site facility	Truck immediately removed from site and will be repaired by a mechanic in the morning.

HWY 91/17 SITE Environmental Spill and Incident Tracking																	
Incident #	Date Of Event	Date Reported	Date Initial Notification Issued	Shift	Approx. Time	Contractor	Sub-Contractor	Silo	Classification	Description of Event	Location	Fluid Amount (L)	Fluid Type	Type of Equipment	Causal Factors	Action Taken	Corrective Actions Date Complete
31	14-Apr-21	14-Apr-21	14-Apr-21	Day	15:31-16:00	PGC	Delta Aggregate		Large Spill (5.1L - 99 9L)	Mechanical failure caused a hydraulic oil spill onto soil	L1400 on the sand preload haul road	approx. 5- 10 L	Hydraulic fluid	Water Truck	Mechanical failure	At approximately 15 30 a spill occurred when a water truck experienced a mechanical failure while spraying water for dust suppression. The spill released approximately 10L of hydraulic fluid to the ground. The spill did not appear to affect any nearby waterways and the spill was contained to the immediate area. PGC immediately responded to the incident and initiated the spill response. The contaminated soil was excavated by hand with a shovel and placed into plastic hazardous waste bags before being stored into a contaminated soil waste bin. The soil will be sent off-site for disposal to an appropriate off-site facility on a later date.	The Water Truck was parked on site and the source of the leak was wrapped in spill pads to prevent more fluid from leaking out. The equipment will be repaired by a mechanic and cleaned before putting back to service.
32	18-Apr-21	18-Apr-21	18-Apr-21	Night	20:31-21:00	PGC	Menard		Large Spill (5.1L - 99 9L)	Improper fueling operations	L2300 and L600W	approx. 10- 20 L	Diesel Fuel	Fuel Truck	Improper Fueling Procedure	At approximately 20 30 three spills were observed under various equipment on site which were not reported to the environmental department. Approximately 20L of Diesel fuel was expected to have been released to the ground and it does not appear to have affected any nearby waterways. The spill was observed to be contained to the immediate area. PGC contacted the responsible party the following morning when they were present on site to initiate the spill response. The contaminated soil was excavated by hand with a shovel and placed into plastic Haz waste bags before being stored into a contaminated soil waste bin. The soil will be sent off-site for disposal to an appropriate off-site facility on a later date.	PGC will be issuing a spill response and refueling toolbox topic for the subcontractor to present to their employees which will be required to sign and acknowledge their environmental obligations on this site.
33	20-Apr-21	20-Apr-21	20-Apr-21	Night	2:01-2:30	PGC	Pro Quip		Spill (1.1 L - 5L)	Improper fueling operations	Truck parking (old)	approx. 2L	Diesel Fuel	Excavator	Improper Fueling Procedure	Improper fueling practices at truck parking. Spill to asphalt- absorbent powder placed on spill- all contaminants scooped up with a shovel and taken to the Hazardous waste management area for proper disposal.	Easy to clean Proquip refuelling company to be reminded of proper fuelling procedures.
34	25-Apr-21	26-Apr-21	26-Apr-21	Night	2:01-2:30	PGC	Steamer Transport		Large Spill (5.1L - 99 9L)	Hydraulic line failure	L2200	10-15L	Hydraulic fluid	Gravel haul truck	Hydolic mechanical failure	Contaminated sand removed. Spill contained. Absorbent pads paced on surface	At approximately 2am one of the sub-contractor gravel trucks hauling sand from the L2200, developed a leak while attempting to offload. (Steamer Transport, unit 404, plate number MM 9854). We estimate about 10 to 15 liters of hydraulic oil was spilled to ground. Immediate response was taken with absorbent pads put down. A visual inspection of the truck was done and determined it was a line coming from the trucks PTO. t was noticed that so if it remained disengaged there was no further chance of additional leakage, the truck was sent away for repairs. Pads were cleaned up and disposed of as to our plans and the soil was removed and placed in a large tote and brought to our yard for disposal
35	5-May-21	6-May-21	6-May-21	Night	20:01-20:30	PGC	Steamer Transport		Spill (1.1 L - 5L)	Mechanical failure- spill to preload	L2300	2L	Hydraulic fluid	Sand delivery truck	Mechanical failure	At approximately 20 25 a Sand delivery truck and trailer had a mechanical failure and spilled approximately two liters of hydraulic fluid onto the placed preload. The spill was contained, and absorbent spill pads were placed on the surface to absorb any surface fluid. All the contaminated soil was dug out and sent to the PGC waste management for disposal by the sub-contractor.	The spill was contained, and absorbent spill pads were placed on the surface to absorb any surface fluid. All the contaminated soil was dug out and sent to the PGC waste management for disposal by the sub-contractor.
36	3-Jun-21	3-Jun-21	3-Jun-21	Day	10:31-11:00	PGC			Minor spill (<1L)	Small hydro-carbo spill while relocating the pipe puller machine	L500	<100ml	Hydraulic fluid	Pipe puller	Mechanical failure	Spill pads were used to wipe down the machine and to remove residue spills from the ground surface. Contaminated soil removed	Machine currently off-line, mechanic was mobilized to repair the machine before it is used again
37	8-Jun-21	8-Jun-21	8-Jun-21	Day	15:01-15:30	PGC			Minor spill (<1L)	Small grease spill from excavator.	L2500 Loop	<250ml	Hydraulic fluid	Excavator	Mechanical failure	Excavator mechanical failure on main boom hydraulic. A few drops of hydraulic dropped on the ground. The drops were and contaminated soil was removed from site for disposal and the excavator was repaired	The excavator was repaired, cleaned, and removed from site by sub-contractor. Sub-contractor have been advised not to conduct on-site repairs.
38	16-Jun-21	16-Jun-21	16-Jun-21	Day	9:01-9:30	PGC			Minor spill (<1L)	Diesel leak from backhoe	L325	~200ml	Diesel Fuel	Backhoe	Improper Fueling Procedure	At approximately 9 00, a fuel spill from a backhoe was identified on sand covered asphalt at the L325 southern shoulder. The spills residue from the ground surface and contaminated soil were removed, and disposed of by PGC	The spill was contained to the immediate area and all the contaminated soil was dug out and sent to the PGC waste management for disposal by the sub-contractor.
39	16-Jun-21	16-Jun-21	16-Jun-21	Day	14:01-14:30	PGC			Spill (1.1 L - 5L)	Small hydraulic leak from excavator	L325	>2,000ml	Hydraulic fluid	Excavator	Mechanical failure	At approximately 14 00, a mechanical failure on the main boom arm of an excavator caused a hydraulic fluid leak on the southern shoulder of L325. Spill pads were used to wipe down the machine and to remove residue spills from the area	The excavator was repaired and all contaminated soil was dug out and sent to the PGC waste management for disposal by the sub-contractor.
40	22-Jun-21	22-Jun-21	22-Jun-21	Day	3:01-3:30	PGC	Menard		Large Spill (5.1L - 99 9L)	Hydraulic leak from haul truck	L2200	5L	Hydraulic fluid	Haul truck	Mechanical failure	Absorbent materials as been placed on the stained asphalt, and contaminated sand is being removed and disposed of	PGC is requesting that all of Menard's field crews and supervisors go through our safety orientation again

HWY 91/17 SITE Environmental Spill and Incident Tracking																	
Incident #	Date Of Event	Date Reported	Date Initial Notification Issued	Shift	Approx. Time	Contractor	Sub-Contractor	Silo	Classification	Description of Event	Location	Fluid Amount (L)	Fluid Type	Type of Equipment	Causal Factors	Action Taken	Corrective Actions Date Complete
41	22-Jun-21	22-Jun-21	22-Jun-21	Day	20:31-21:00	PGC	Menard		Minor spill (<1L)	Hydraulic Leak from Zoomboom	L2200	~100ml	Hydraulic fluid	Zoomboom	Mechanical failure	The small amount of contaminated soil was excavated and removed.	PGC requested the equipment be removed from site Menard agreed to remove the equipment on June 24th on night shift
42	30-Jun-21	30-Jun-21	30-Jun-21	Day	8:01-8:30	PGC	All-Road		Minor spill (<1L)	Diesel leak from backhoe	L325	~200ml	Diesel Fuel	Backhoe	Improper Fueling Procedure	At approximately 8 00, a fuel spill from a backhoe was identified on sand covered asphalt at the L325 southern shoulder. The contaminated soil was removed and disposed of at the PGC waste management yard.	The spill was contained to the immediate area and all the contaminated soil was dug out and sent to the PGC waste management for disposal by the sub-contractor.

SUMMARY		
Totals	Unit/Value	Total
Total Volume	L	0
Total Spills	#	15
Classification	Total	
Minor Spill (<1L)	#	4
Spill (1.1L-5L)	#	0
Large Spill (5.1L-99 9L)	#	5
Significant Spill (To water or >100L)	#	0
Total	#	9
Fluid Type	Total	
Hydraulic	#	10
Antifreeze	#	0
Diesel	#	3
Oil	#	1
Gasoline	#	0
Black Water	#	0
Glycol	#	0
Unknown	#	0
Total	#	14

APPENDIX 3: WILDLIFE SALVAGE RESULTS

Fish Salvage Results 09 June 2021

Location: L2250 (Area I).

Method of Salvage: minnow trapping.

Site Conditions: 5 cm water depth and no flow.

Species Common Name	Genus and Species	Total Salvaged
Three-spined Stickleback	<i>Gasterosteus aculeatus</i>	3
Northwestern Salamander	<i>Ambystoma gracile</i>	3
Unidentified Tadpole	--	1

APPENDIX 4: PERMIT TRACKER

Notes: * Agency appraiser's real risks as a subject word and once a subject or on has been completed in a specified real or actually creating the appraiser's based on the type, review and 'out of the Design's cost is.

The following Table is designed to report new information on the system.

The column is to be used to report on the system, and the column is to be used to report on the system.

APPENDIX 5: PERMIT CONDITIONS TRACKER

Conditions	Responsibility
1 The removal of or disturbance to riparian vegetation should be kept to a minimum during the works.	PGC
2 Whenever possible, works are to be conducted when the watercourse is dry.	PGC
3 If works are not conducted in the dry, works are to be conducted in isolation of flow and the following measures are to be implemented:	PGC
a An appropriately qualified professional is to conduct a fish salvage of the isolated work area. Choose low impact salvage methods such as minnow trapping and seining before opting for higher impact electrofishing. In the event that isolation is breached, stop work and repeat fish salvage efforts.	Brybil
b Dewater the isolated area gradually to reduce the potential for stranding fish.	PGC
c Ensure bypass pump intakes and outlets are located within the confines of the fish-isolated work area (i.e., to prevent fish impingement on pump intakes, and to prevent dewatering areas where fish may be present). Ensure pumps are screened to prevent entrainment or impingement of fish in accordance with DFO's interim code of practice for End-of-pipe Fish Protection Screens for Small Water Intakes in Freshwater (https://www.dfo-mpo.gc.ca/pnw-ppe/codes/screen-ecraneng.html).	PGC/Brybil
d When diverting watercourse flows, maintain an appropriate depth and flow (i.e., base flow) for the protection of fish and fish habitat downstream of the isolated work area.	PGC
4 Complete the works as quickly as possible once they are started.	PGC
5 Undertake works during dry weather and low water conditions.	PGC
6 Equipment is to be situated in the dry watercourse channel within the footprint of the works or operated from the top of the bank.	PGC
7 Ensure that material such as rock, riprap, or other materials placed on the banks or within the active channel or floodplain of the watercourse is inert and free of silt, overburden, debris, or other substances deleterious to aquatic life.	PGC
8 Minimize the introduction of sediments (e.g., silts, clays and sand) into the watercourse or downstream reaches of the watercourse.	PGC
9 Develop and implement an erosion and sediment control plan to avoid and minimize the introduction of sediment into or induced sedimentation in the watercourse.	PGC
10 Do not deposit any substances deleterious to fish or fish habitat directly or indirectly into the watercourse or downstream reaches of the watercourse.	PGC
11 Develop and implement a response plan to avoid a spill of deleterious substances into the watercourse.	PGC
12 Works should be monitored full-time during start-up and any instream works or sensitive activity. The environmental monitor must be an appropriately qualified professional and ensure mitigation measures are implemented for the protection of fish and fish habitat.	PGC, weekly audit MESL
13 While the Program recommends works be conducted during the least risk to fish instream work window of August 1 – September 15 where possible. It is recognized instream works will be required to commence upland works. Therefore, if works are proposed for outside the least risk window, work should especially be conducted under the direction of an appropriately qualified professional as per item 12 above.	PGC
14 Monitor before, during, and after all phases of construction to ensure that fish do not become trapped/isolated, stranded, or entrained within the project area.	PGC, weekly audit MESL
15 If fish are observed at the site, or upstream or downstream of the site, work should be halted. Works may only resume following implementation of appropriate mitigation measures and under the direction of an appropriately qualified professional.	PGC
16 Ensure that when dewatering, site water is appropriately managed to prevent sediment laden water from entering downstream watercourses.	PGC

Conditions		Responsibility
1	The removal of or disturbance to riparian vegetation should be kept to a minimum during the works.	PGC
2	Whenever possible, works are to be conducted when the watercourse is dry.	PGC
3	If instream works are not conducted in the dry, works are to be conducted in isolation of flow and the following measures are to be implemented:	PGC
a	An appropriately qualified professional is to conduct a fish salvage of the isolated work area. Choose low impact salvage methods such as minnow trapping and seining before opting for higher impact electrofishing. In the event that isolation is breached, stop work and repeat fish salvage efforts.	Brybil
b	Dewater the isolated area gradually to reduce the potential for stranding fish.	PGC
c	Ensure bypass pump intakes and outlets are located within the confines of the fish-isolated work area (i.e., to prevent fish impingement on pump intakes, and to prevent dewatering areas where fish may be present). Ensure pumps are screened to prevent entrainment or impingement of fish in accordance with DFO's interim code of practice for End-of-pipe Fish Protection Screens for Small Water Intakes in Freshwater (https://www.dfo-mpo.gc.ca/pnw-ppe/codes/screen-ecraneng.html).	PGC/Brybil
d	When diverting watercourse flows, maintain an appropriate depth and flow (i.e., base flow) for the protection of fish and fish habitat downstream of the isolated work area.	PGC
4	Complete the works as quickly as possible once they are started.	PGC
5	Undertake works during dry weather and low water conditions.	PGC
6	Equipment is to be situated in the dry watercourse channel within the footprint of the works or operated from the top of the bank.	PGC
7	Ensure that material such as rock, riprap, or other materials placed on the banks or within the active channel or floodplain of the watercourse is inert and free of silt, overburden, debris, or other substances deleterious to aquatic life.	PGC
8	Minimize the introduction of sediments (e.g., silts, clays and sand) into the watercourse or downstream reaches of the watercourse.	PGC
9	Develop and implement an erosion and sediment control plan to avoid and minimize the introduction of sediment into or induced sedimentation in the watercourse.	PGC
10	Do not deposit any substances deleterious to fish or fish habitat directly or indirectly into the watercourse or downstream reaches of the watercourse.	PGC
11	Develop and implement a response plan to avoid a spill of deleterious substances into the watercourse.	PGC
12	Works should be monitored full-time during start-up and any instream works or sensitive activity. The environmental monitor must be an appropriately qualified professional and ensure mitigation measures are implemented for the protection of fish and fish habitat.	PGC, weekly audit MESL
13	The Program recommends works within fish-bearing or potentially fish-bearing watercourses be completed during the least risk to fish instream work window of August 1 – September 15 where possible. However, it is recognized that there are proposed instream works outside this window. Therefore, if works are proposed for outside this time window, additional measures should be implemented under the direction of an appropriately qualified professional, as per item 12 above.	PGC
14	Monitor before, during, and after all phases of construction to ensure that fish do not become trapped/isolated, stranded, or entrained within the project area.	PGC, weekly audit MESL
15	If fish are observed at the site, or upstream or downstream of the site, work should be halted. Works may only resume following implementation of appropriate mitigation measures and under the direction of an appropriately qualified professional.	PGC
16	Ensure that when dewatering, site water is appropriately managed to prevent sediment laden water from entering downstream watercourses.	PGC
17	Use non-acid rock drainage and metal leaching (non-ARD/ML) riprap.	

DFO 20-HPAC-00304

Subject: Highway 91/17 – Site G – Wetland Infilling, Burns Bog, Delta - Implementation of Measures to Avoid and Mitigate the Potential for Prohibited Effects to Fish and Fish Habitat

Conditions	Responsibility
1 The removal of or disturbance to riparian vegetation should be kept to a minimum during the works.	PGC
2 Whenever possible, works are to be conducted when the watercourse is dry.	PGC
3 If works in the roadside ditches are not conducted in the dry, works are to be conducted in isolation of flow. When diverting watercourse flows, maintain an appropriate depth and flow (i.e., base flow) for the protection of fish and fish habitat downstream of the isolated work area.	PGC
4 Complete the works as quickly as possible once they are started.	PGC
5 Undertake works during dry weather and low water conditions.	PGC
6 Equipment is to be situated in the dry watercourse channel within the footprint of the works or operated from the top of the bank.	PGC
7 Ensure that material such as rock, riprap, or other materials placed on the banks or within the active channel or floodplain of the watercourse is inert and free of silt, overburden, debris, or other substances deleterious to aquatic life.	PGC
8 Minimize the introduction of sediments (e.g., silts, clays and sand) into the watercourse or downstream reaches of the watercourse.	PGC
9 Develop and implement an erosion and sediment control plan to avoid and minimize the introduction of sediment into or induced sedimentation in the watercourse.	Brybil -develop PGC - lead and implement
10 Do not deposit any substances deleterious to fish or fish habitat directly or indirectly into the watercourse or downstream reaches of the watercourse.	PGC
11 Develop and implement a response plan to avoid a spill of deleterious substances into the watercourse.	PGC, weekly audit MESL
12 Works should be monitored full-time during start-up and any instream works or sensitive activity. The environmental monitor must be an appropriately qualified professional and ensure mitigation measures are implemented for the protection of fish and fish habitat.	PGC, weekly audit MESL
13 If fish are observed at the site, or upstream or downstream of the site, work should be halted. Works may only resume under the direction of an appropriately qualified professional, as per Item 12 above, with the following measures in place: a Works are to be conducted in isolation of flow. An appropriately qualified professional is to conduct a fish salvage of the isolated work area. Choose low impact salvage methods such as minnow trapping and seining before opting for higher impact electrofishing. Use appropriate fish handling techniques and relocate salvaged fish to a nearby undisturbed location. In the event that isolation is breached, stop work and repeat fish salvage efforts. b Dewater the isolated area gradually to reduce the potential for stranding fish. Ensure bypass pump intakes and outlets are located within the confines of the fish-isolated work area (i.e., to prevent fish impingement on pump intakes, and to prevent dewatering areas where fish may be present). Ensure pumps are screened to prevent entrainment or impingement of fish in accordance with DFO's interim code of practice for End-of-pipe Fish Protection Screens for Small Water Intakes in Freshwater (https://www.dfo-mpo.gc.ca/pnw-ppe/codes/screen-ecran-eng.html). c Monitor before, during, and after all phases of construction to ensure that fish do not become trapped/isolated, stranded, or entrained within the project area. d Ensure that when dewatering, site water is appropriately managed to prevent sediment laden water from entering downstream watercourses. e Ensure that flows are maintained to downstream fish habitat in East Ditch, West Ditch, Silda Ditch, and 96 Street Ditch.	PGC PGC Brybil PGC PGC, Brybil PGC PGC PGC
14 Use non-acid rock drainage and metal leaching (non-ARD/ML) riprap.	PGC

Conditions	Responsibility
1 The removal of or disturbance to riparian vegetation should be kept to a minimum during the works.	
2 Whenever possible, works are to be conducted when the watercourse is dry.	
3 If works are not conducted in the dry, works are to be conducted in isolation of flow and the following measures are to be implemented: An appropriately qualified professional is to conduct a fish salvage of the isolated work area. Choose low impact salvage methods such as minnow trapping and a seining before opting for higher impact electrofishing. In the event that isolation is breached, stop work and repeat fish salvage efforts. b Dewater the isolated area gradually to reduce the potential for stranding fish. Ensure bypass pump intakes and outlets are located within the confines of the fish-isolated work area (i.e., to prevent fish impingement on pump intakes, and to prevent dewatering areas where fish may be present). Ensure pumps are screened to prevent entrainment or impingement of fish in accordance with DFO's interim c code of practice for End-of-pipe Fish Protection Screens for Small Water Intakes in Freshwater (https://www.dfo-mpo.gc.ca/pnw-ppe/codes/screen-ecraneng.html). When diverting watercourse flows, maintain an appropriate depth and flow (i.e., base flow) for the protection of fish and fish habitat downstream of the isolated d work area.	
4 Complete the works as quickly as possible once they are started.	
5 Undertake works during dry weather and low water conditions.	
6 Equipment is to be situated in the dry watercourse channel within the footprint of the works or operated from the top of the bank.	
7 For works in fish-bearing waters, fish passage is to be maintained through any culverts in fish-bearing waters upon completion of works.	
8 Ensure that material such as rock, riprap, or other materials placed on the banks or within the active channel or floodplain of the watercourse is inert and free of silt, overburden, debris, or other substances deleterious to aquatic life.	
9 Minimize the introduction of sediments (e.g., silts, clays and sand) into the watercourse or downstream reaches of the watercourse.	
10 Develop and implement an erosion and sediment control plan to avoid and minimize the introduction of sediment into or induced sedimentation in the watercourse.	
11 Do not deposit any substances deleterious to fish or fish habitat directly or indirectly into the watercourse or downstream reaches of the watercourse.	
12 Develop and implement a response plan to avoid a spill of deleterious substances into the watercourse.	
13 Works should be monitored full-time during start-up and any instream works or sensitive activity. The environmental monitor must be an appropriately qualified professional and ensure mitigation measures are implemented for the protection of fish and fish habitat.	
14 While the Program recommends works be conducted during the least risk to fish instream work window of August 1 – September 15 where possible. It is recognized that there are proposed instream works outside this window. Therefore, if works are proposed for outside the least risk window, work should especially be conducted under the direction of an appropriately qualified professional and additional measure should be implemented, as per item 13 above.	
15 Monitor before, during, and after all phases of construction to ensure that fish do not become trapped/isolated, stranded, or entrained within the project area	
16 If fish are observed at the site, or upstream or downstream of the site, work should be halted. Works may only resume following implementation of appropriate mitigation measures and under the direction of an appropriately qualified professional.	
17 Ensure that when dewatering, site water is appropriately managed to prevent sediment laden water from entering downstream watercourses.	
18 Use non-acid rock drainage and metal leaching (non-ARD/ML) riprap.	

DFO 20-HPAC-00349
 Highway 91/17 Upgrades – Site I, Nordel Ditches & West Ditch – Implementation of Measures to Avoid and Mitigate the Potential for Prohibited Effects to Fish and Fish Habitat

Conditions	Responsibility
1 The removal of or disturbance to riparian vegetation should be kept to a minimum during the works.	PGC
2 Whenever possible, works are to be conducted when the watercourse is dry.	PGC
3 If works are not conducted in the dry, works are to be conducted in isolation of flow and the following measures are to be implemented	PGC/Brybil
a An appropriately qualified professional is to conduct a fish salvage of the isolated work area. Choose low impact salvage methods such as minnow trapping and seining before opting for higher impact electrofishing. In the event that isolation is breached, stop work and repeat fish salvage efforts.	Brybil
b Dewater the isolated area gradually to reduce the potential for stranding fish.	PGC
c Ensure bypass pump intakes and outlets are located within the confines of the fish-isolated work area (i.e., to prevent fish impingement on pump intakes, and to prevent dewatering areas where fish may be present). Ensure pumps are screened to prevent entrainment or impingement of fish in accordance with DFO's interim code of practice for End-of-pipe Fish Protection Screens for Small Water Intakes in Freshwater (https://www.dfompo.gc.ca/pnw-ppe/codes/screen-ecran-eng.html).	PGC
d When diverting flows, maintain an appropriate depth and flow (i.e., base flow) for the protection of fish and fish habitat, both upstream and downstream of the isolated work area.	PGC
4 Complete the works as quickly as possible once they are started.	PGC
5 Undertake works during dry weather and low water conditions.	PGC
6 Equipment is to be situated in the dry stream channel within the footprint of the works or operated from the top of the bank.	PGC
7 Ensure that material such as rock, riprap, or other materials placed on the banks or within the active channel or floodplain of the watercourse is inert and free of silt, overburden, debris, or other substances deleterious to aquatic life.	PGC
8 Minimize the introduction of sediments (e.g., silts, clays and sand) into the watercourse or downstream reaches of the watercourse.	PGC
9 Develop and implement an erosion and sediment control plan to avoid and minimize the introduction of sediment into or induced sedimentation in the watercourse.	PGC
10 Do not deposit any substances deleterious to fish or fish habitat directly or indirectly into the watercourse or downstream reaches of the watercourse.	PGC
11 Develop and implement a response plan to avoid a spill of deleterious substances into the watercourse.	PGC
12 Works should be monitored full-time during start-up and any instream works or sensitive activity. The environmental monitor must be an appropriately qualified professional and ensure mitigation measures are implemented for the protection of fish and fish habitat.	PGC, weekly audit MESL
13 Monitor before, during, and after all phases of construction to ensure that fish do not become trapped/isolated, stranded, or entrained within the project area.	PGC
14 Ensure that when dewatering, site water is appropriately managed to prevent sediment laden water from entering downstream watercourses.	PGC
15 Use non-acid rock drainage and metal leaching (non-ARD/ML) rip rap.	PGC

Highway 91/17 Upgrades – Site H, Unnamed Tributary Ditches to Silda Ditch – Implementation of Measures to Avoid and Mitigate the Potential for Prohibited Effects to Fish and Fish Habitat

Conditions	Responsibility
1 The removal of or disturbance to riparian vegetation should be kept to a minimum during the works.	PGC
2 Whenever possible, works are to be conducted when the watercourse is dry.	PGC
3 If works are not conducted in the dry, works are to be conducted in isolation of flow and the following measures are to be implemented:	PGC/Brybil
a An appropriately qualified professional is to conduct a fish salvage of the isolated work area. Choose low impact salvage methods such as minnow trapping and seining before opting for higher impact electrofishing. In the event that isolation is breached, stop work and repeat fish salvage efforts.	Brybil
b Dewater the isolated area gradually to reduce the potential for stranding fish.	PGC
c Ensure bypass pump intakes and outlets are located within the confines of the fish-isolated work area (i.e., to prevent fish impingement on pump intakes, and to prevent dewatering areas where fish may be present). Ensure pumps are screened to prevent entrainment or impingement of fish in accordance with DFO's interim code of practice for End-of-pipe Fish Protection Screens for Small Water Intakes in Freshwater (https://www.dfompo.gc.ca/pnw-ppe/codes/screen-ecran-eng.html).	PGC
d When diverting flows, maintain an appropriate depth and flow (i.e., base flow) for the protection of fish and fish habitat, both upstream and downstream of the isolated work area.	PGC
4 Complete the works as quickly as possible once they are started.	PGC
5 Undertake works during dry weather and low water conditions.	PGC
6 Equipment is to be situated in the dry stream channel within the footprint of the works or operated from the top of the bank.	PGC
7 Ensure that material such as rock, riprap, or other materials placed on the banks or within the active channel or floodplain of the watercourse is inert and free of silt, overburden, debris, or other substances deleterious to aquatic life.	PGC
8 Minimize the introduction of sediments (e.g., silts, clays and sand) into the watercourse or downstream reaches of the watercourse.	PGC
9 Develop and implement an erosion and sediment control plan to avoid and minimize the introduction of sediment into or induced sedimentation in the watercourse.	PGC
10 Do not deposit any substances deleterious to fish or fish habitat directly or indirectly into the watercourse or downstream reaches of the watercourse.	PGC
11 Develop and implement a response plan to avoid a spill of deleterious substances into the watercourse.	PGC
12 Works should be monitored full-time during start-up and any instream works or sensitive activity. The environmental monitor must be an appropriately qualified professional and ensure mitigation measures are implemented for the protection of fish and fish habitat.	PGC, weekly audit MESL
13 Monitor before, during, and after all phases of construction to ensure that fish do not become trapped/isolated, stranded, or entrained within the project area.	PGC
14 Ensure that when dewatering, site water is appropriately managed to prevent sediment laden water from entering downstream watercourses.	PGC
15 Use non-acid rock drainage and metal leaching (non-ARD/ML) rip rap.	PGC

WSA Notification 100310655
Notice to Habitat Officer / Changes in and about a Stream under Part 3 Water Sustainability Regulation

Conditions	Responsibility
1 Any work associated with the proposed changes in and about a stream must not cause stream channel instability or increase the risk of sedimentation into the stream.	PGC
2 During work onsite, erosion and sediment control materials must be available on site at all times and must be installed if sedimentation is likely to occur into the stream. A contingency plan must be developed outlining the measures to be taken by workers when carrying out any work to control erosion and sediment.	PGC
3 Soil disturbance must not occur in heavy rain conditions and any soil removed must be placed in a location that ensures that sediment or debris does not enter the stream.	PGC
4 Within a work area, water that contains sediment must be pumped to a vegetated area away from the stream where it can seep into the ground, or to a settling pond that is sufficiently far from the stream to allow sediment to settle out before the water returns to the stream.	PGC
5 The disturbance of stream bank vegetation must not occur or be minimized as much as possible.	PGC
6 Any areas that are disturbed during the work (such as exposed soil) must be promptly restored to a minimum to the pre-disturbance condition. Note: Guidance is provided in the Enhancement Section of the Best Management Practices Instream Works	PGC
7 If possible, work must be conducted on, and equipment located and operated from, dry land (no water present) and the worksite must be isolated from flowing water.	PGC
8 Any equipment used in conducting work must be in good mechanical condition and, when operating in close proximity to the wetted perimeter of a stream, the operator must prevent entry of any substance, sediment, debris or material (e.g., hydrocarbons, silt) into the stream so as to prevent harm to fish, wildlife or the aquatic ecosystem of a stream. Note that Section 46 of the Water Sustainability Act prohibits the introduction of foreign matter into a stream. Failure to comply may result in a remediation order and it is also an offence to do so.	PGC
9 The original rate of water flow in the stream (existing prior to commencing work) must be maintained upstream and downstream of the worksite during all phases of instream activity associated with the work.	PGC
10 When work requires de-watering or isolation of the worksite in the stream, a permit for the salvage of fish and wildlife must be obtained prior to commencing work. All required salvage permits must be obtained from Front Counter BC : http://www.frontcounterbc.gov.bc.ca/ . Any salvage must be carried out by a qualified environmental professional (such as an R.P.Bio.).	Brybil
11 Following de-watering or isolation of the worksite, stream flow must be returned gradually to the de-watered or isolated area within the stream and not in a single sudden rush so as to avoid erosion of the stream channel and sediment delivery to the stream.	PGC
12 The stream channel width must not change as a result of the work.	PGC
13 Any materials, such as riprap or gabion rock, placed within the stream must be clean and not contain substances that could be harmful to fish, wildlife or the aquatic ecosystem of the stream.	PGC
14 Any areas disturbed as part of the work must be restored as close as possible to their pre-disturbance condition. Any soil exposed at the worksite must be promptly re-vegetated.	PGC
15 Subject to section 16 and 17 below, the work must be completed during the timing window for the stream in respect of which the changes are proposed. The applicable timing window (by region and/or by stream) are specified in the following links (see below) and are designed to protect fish, wildlife or the aquatic ecosystem of a stream. To determine the timing window, please select the relevant region from the map: http://www.frontcounterbc.ca/pdf/RegionMap.pdf and then determine the applicable timing window: *Regional Timing Windows: http://www2.gov.bc.ca/gov/content/environment/air-land-water/water/water-licensing-rights/working-around-water/regional-terms-conditions-timing-windows <for that region and for the stream where the proposed changes will be made. For projects proposed to take place outside these timing windows, please see section 16 and 17 below	PGC
16 In addition to the timing windows specified in section 15 above, work may be carried out during the following times provided these requirements are met when the changes are carried out: i. If the stream channel is naturally dry (no flow) or frozen to the bottom at the worksite and the instream work / activity associated with the proposed change will not adversely impact fish, wildlife or the aquatic ecosystem of the stream (e.g. not result in any substance, sediment, debris or other material entering or leaching into the stream that would adversely affect fish, wildlife or the aquatic ecosystem), ii. In the construction of a winter crossing, the stream channel is frozen to the bottom at the worksite and related work does not adversely impact the stream channel (including stream bed and banks), or fish, wildlife or the aquatic ecosystem of the stream, or impede their passage (in both directions) in the stream.	PGC PGC PGC
17 If your work is proposed outside of the timing window (as described in section 15 above), you must retain a qualified environmental professional (such as an R.P. Bio.). The professional will be responsible for providing a written technical rational that assesses and addresses the risks of the proposed changes in and about a stream, including proposing site specific mitigation (e.g. an Erosion Control Plan that identifies contingency measures and emergency procedures related to the proposal) and onsite monitoring of their implementation. This document must be submitted to the Habitat Officer via Front Counter B.C. with reference to your file number (shown on top of this document).	PGC

WSA Approval 2007795 Change Approval -Changes In and About 96th Street Ditch and Silda Ditch (Sites B, D, and E)

Legend
Difference between Approval 2007783 & 2007795
Difference between Approval 2007749 & 2007795
Difference between Approval 2007770 & 2007795
Difference between Approval 2007755 & 2007795

Conditions	Responsibility
If land clearing is to occur within the breeding bird period (March 30 to August 16 in Zone A1, which includes the Lower Mainland and Fraser Valley), a nest survey must be conducted and a 10m no-clearing buffer placed around the nest until the nest is determined to be no longer active.	PGC, Brybil
d The work(s) authorized in this Approval shall be completed on or before Dec. 31, 2023.	PGC
e All works associated with the Environmental Enhancement Management Plan, as outlined in clause (m) and required in clause (oo) below, shall be completed on or before December 31, 2033 (based on 10 years).	PGC, Brybil - development of plan
f Work in the stream and stream channel shall occur only during the periods outlined below, so that the fisheries interests are protected	PGC - implementation
1 Instream work during the reduced risk instream work window shall occur during the period of August 1 to September 15; or	Brybil/MESL - provide input
2 Based on project justification and risk, instream work outside of the reduced risk instream work window (as stated above), subject to the following	
i An appropriately qualified professional shall provide advice to the holder of this Approval on the timing of the work based on the nature of the works, environmental values (including fish, amphibians, wildlife, any listed species present), water quality, channel stability, weather conditions, water levels, and any other relevant factors); and	
ii The Qualified Professional shall also provide additional construction mitigation advice to the holder of this Approval, and daily or full-time supervision of all work in or near the stream; and	
iii Work must be timed and planned appropriately, the stream must be completely dry or have marginal flows for the duration of the construction activities; and	
iv The advice of the Qualified Professional on construction timing (as per (i) above) and mitigation measures (as per (ii) above), as well as the timing of work and the presence of the Qualified Professional, must be documented in writing. This documentation must be submitted as part of the post construction reporting for this project.	
g All machinery and equipment operating within the stream shall be clean, free of external grease, oil or fluid leaks and shall use biodegradable grease, oil and fluids.	PGC
h Fuelling and servicing of vehicles and equipment must occur a minimum of 30 metres away from all streams, lakes and waterbodies. Keep a spill containment kit on site and train on site staff in its use. Immediately report any spill of a substance that is toxic, polluting, or deleterious to aquatic life of reportable quantities to the Dangerous Goods Incident Report 24-hour phone line at 1-800-663-3456.	PGC
i The works shall not result in depressions that have the ability to trap fish and other aquatic life.	PGC
j The holder of this approval shall take reasonable care to avoid damaging any land, works, trees, or other property and shall make full compensation to the owners for any damage or loss resulting from the exercise of the rights granted with this approval.	PGC
k Riparian areas which are disturbed by the works shall be restored to their original condition and protected from erosion.	PGC
l All material utilized during construction shall be contained and placed in a stable area such that it is not able to mobilize, and it shall be managed to avoid entry into any stream or watercourse.	PGC
m All works shall be completed in accordance with	PGC
1 ENG DWG Site E Culvert Plan and Profile, 2020-01-27	PGC
2 ENG DWG Site B Culvert Plan and Profile, 2020-01-27	PGC
3 ENG DWG Site D River Road Interchange Silda Wetland Encroachment, 2020-02-19	PGC
4 Report Section 11 Approval Application Highway 91/17 Upgrades, Section 1 And 2, By Brybil Projects Ltd., February 21, 2020	PGC
5 Stormwater Management Plan, McElhanney May 6, 2020	PGC
6 CEMP, 3rd Revision, May, 2020	PGC
7 Surface Water Quality & Sediment Control Plan (of CEMP)	PGC
8 Fisheries Habitat Mitigation and Compensation Plan (of CEMP)	PGC
9 Environmental Enhancement Management Plan (CEMP), Brybil Projects Ltd., June 2020	PGC
10 Memo Additional FLNRO information, Dave Hayward, Brybil, June 8, 2020	PGC
n The holder of this approval must adhere to the standards of professional accountability, as signed off by Qualified Professional(s), Dave Hayward and Rob Hoogendorn on June 2, 2020, regarding the Key Aquatic Habitat Questions for Qualified Professionals specific to Bank Erosion Protection and Stream Diversion/in-filling, on behalf of the holder of this approval. It is the responsibility of the holder of this Approval to retain an appropriately qualified professional(s) for the relevant duration of works in order to uphold this signed professional assessment.	PGC
o All work shall be carried out in accordance with the Provincial "Standards and Best Practices for In-stream Works" (2004). The Provincial guidance document can be found at the following link http://www.env.gov.bc.ca/wld/documents/bmp/iswstdsbpsmarch2004.pdf .	PGC
p The holder of this Approval must hire an appropriately Qualified Professional to conduct Environmental Monitoring on all in-stream works authorized under this Approval. The Qualified Professional must be an applied scientist or technologist, acting alone or together with another	
July 23, 2020 Job Number 114324 File Number 20077955 of 10 Ministry of Forests, Lands, Natural Resource Operations, and Rural Development Water Management Mailing Address 200-10428 153 Street, Surrey BC V3R 1E1 Location 200-10428 153 Street, Surrey BC V3R 1E1 Phone (604) 586-4400 Fax (604) 586-4444 Web https://www2.gov.bc.ca/gov/content/environment/air-land-water/water/qualified-professional . He or she must be registered and in good standing in British Columbia with an appropriate professional organization constituted under an Act, acting under that association's code of ethics and subject to disciplinary action by that association. The Qualified Professional is responsible for observing the methods of construction and preparing information and reports on the compliance of the construction activities. The Qualified Professional shall	
1 Ensure all best management practices and mitigation measures are in place to avoid and minimize environmental impact on the land and on fish and fish habitat of the stream.	PGC
2 Where applicable, assist in the isolation of the stream prior to the commencement of works.	PGC
3 Implement and ensure erosion and sediment control measures are constructed, installed, and maintained appropriately for the full duration of instream works.	PGC
4 Supervise all instream works authorized under this Approval.	PGC
5 When the works involve temporary diversions to isolate the work site,	PGC
i Monitor all diversion works daily to ensure pumps & flow by passes are in proper working condition;	PGC
ii Ensure diversion works that include pump intakes be screened for fish and aquatic species in accordance with the "Interim code of practice End-of-pipe fish protection screens for small water intakes in freshwater" (Fisheries and Oceans Canada, 2020); and	PGC
iii Ensure fish are prevented from entering the works.	PGC
6 When the works involve dewatering or isolation of flow and the stream is known or suspected to contain fish and/or amphibians,	PGC
i Attend the site prior to conducting any instream works to complete fish and wildlife search and salvages;	PGC, Brybil
ii Obtain any permits needed prior to undertaking the salvage(s); and	Brybil
iii Inspect the extraction area for fish stranding at least once after water levels have declined.	PGC, Brybil
7 In the event of an environmental incident or non-compliance with any of the terms or conditions of this Approval, notify the Water Manager (SouthCoastWSAReporting@gov.bc.ca), within 24 hours.	PGC
8 Be granted authority to stop the work authorized under this Approval if deemed necessary to address risks to the environment. The Qualified Professional or their designate (specified in writing) must be on site during all phases of construction in and around the stream to ensure this component is upheld.	PGC, MESL
q Upon commencement of the project, the work shall be pursued to completion as quickly as possible.	PGC
r All equipment and machinery used in or near the stream channel	PGC
1 Must be in good operating condition and free of leaks, excess oil and grease;	PGC

2 Must have a spill containment kit readily accessible on-site;	PGC
3 May not be refuelled within 30 meters of any watercourse; and	PGC
4 Must use environmentally sensitive hydraulic fluids which are non-toxic to aquatic life and which are readily or inherently bio-degradable.	PGC
s Any spill of a substance that is toxic, polluting, or deleterious to aquatic life of reportable quantities must be reported to the Dangerous Goods Incident Report 24-hour phone line at 1-800-663-3456.	PGC
t Sediment and Erosion Control measures to prevent the release of silt, sediment or sediment-laden water must be in place before starting works that may result in sediment mobilization. Care shall be exercised during all phases of the work to prevent the release of silt, sediment, sediment-laden water, raw concrete, concrete leachate or any deleterious substances. All control measures must meet or surpass the Provincial "Standards and Best Practices for In-stream Works" (2004) and the "Land Development Guidelines for the Protection of Aquatic Habitat" (Fisheries and Oceans Canada and the British Columbia, 1993).	PGC
u Sediment removal boundaries must be clearly delineated prior to commencement of work. All sediment excavation for removal purposes shall be completed in isolation of the stream flows.	PGC
v Care shall be exercised during sediment screening so that fine size fractions are not introduced into wetted areas or left in dry areas of the stream channel following the completion of work.	PGC
w Discharge and runoff water from the site into any watercourse(s) must comply with the BC Approved Water Quality Guidelines for the Protection of Aquatic Life (https://www2.gov.bc.ca/gov/content/environment/air-land-water/water/water-quality/water-quality-guidelines/approved-water-quality-guidelines and https://www2.gov.bc.ca/assets/gov/environment/air-land-water/water/waterquality/wqgs-wqos/approved-wqgs/turbidity-or.pdf) and/or the applicable Local Government Bylaw(s). Water quality monitoring must be conducted by an appropriately qualified professional or their designated Environmental Monitor on every day in which instream works are being conducted. Measurements must be taken upstream of any works taking place and within the extent of the sedimentation downstream of where instream work is actively occurring. Measurements should be taken immediately prior to works beginning, and then at regular intervals until the works are completed and may require additional frequency during wet weather conditions. Wet weather conditions will be defined as being equal to or greater than 25 millimetres of rainfall within a 24-hour period.	PGC
x All excavated material and debris shall be removed from the site or placed in a stable area above the high-watermark of the stream. Mitigative measures must be applied July 23, 2020 Job Number 114324 File Number 20077957 of Ministry of Forests, Lands, Natural Resource Operations, and Rural Development Water Management Mailing Address 200-10428 153 Street, Surrey BC V3R 1E1 Location 200-10428 153 Street, Surrey BC V3R 1E1 Phone (604) 586-4400 Fax (604) 586-4444 Web https://www2.gov.bc.ca/gov/content/environment/air-land-water/waterto protect the excavated material and debris from erosion and reintroduction into the watercourse. These measures may include covering the material with erosion blankets, seeding and planting with native vegetation, or as otherwise directed by a Qualified Professional.	PGC
y All material utilized during construction shall be contained and placed in a stable area such that it is not able to mobilize and managed to avoid entry into any stream or watercourse.	PGC
z Measures must be taken to ensure that no harmful material (e.g. fuel and other hydrocarbons, soil, road fill, or sediment) which could adversely impact water quality, fish and other aquatic life, and/or fish habitat, be allowed to enter the wetted perimeter as a result of the project activities. All staff must be trained in handling and applying a spill kit appropriately to any spills/incidents.	PGC
aa Site preparation is to be carried out from the banks of the stream, thus minimizing disturbance to the stream.	PGC
bb The holder of this Approval shall ensure that instream works are designed and installed so as not to restrict fish passage and/or lead to fish stranding.	PGC
cc All temporary works (including a ford, stream crossing and flow bypass) shall be removed on completion of the project, and the stream channel restored to its natural condition.	PGC
dd Vegetation along the banks of the stream shall be disturbed as little as possible. All disturbed areas must be restored using native vegetation that is suitable for the site conditions.	PGC
ee All disturbed areas of the banks of the stream shall be restored to their original condition.	PGC
ff The new channel of the stream must have greater or equal hydraulic capacity than the existing channel.	MESL Design, PGC implementation
gg The hydraulic capacity of installed culvert(s) must be equivalent to the hydraulic capacity of the stream channel or be capable of passing the 1 in 200 year maximum daily flow without the water level at the culvert(s) inlet exceeding the top of the culvert(s).	MESL Design, PGC implementation
hh Rock used as riprap shall be clean of any substances deleterious to aquatic life and shall be durable, angular in shape and suitably graded and sized to resist movement by stream flow. Any other engineering material required for the construction of the works shall be clean of any substances deleterious to aquatic life.	PGC
ii All rock used in the works shall be clean and free of sediment producing material, durable, non-acid generating and suitably graded.	PGC
jj Treated wood products shall not be used in any construction below the high-water mark of the stream channel.	PGC
kk Large woody debris and the stubs of large diameter trees must be left in place or retained on-site where it is safe to do so.	PGC
l Care shall be exercised during pile driving to minimize potential adverse impacts to fish or wildlife. The following mitigation measures shall be implemented	PGC
1 Where possible and feasible, piles should be installed using a vibratory hammer.	PGC
2 Piles installed using an impact hammer must implement mitigation measures to reduce water pressure sound waves in excess of 30 kilopascals (kPa).	PGC
3 Mitigation measures such as bubble curtains, double wall piles, or isolation methods shall be implemented to avoid adverse impacts to fish.	PGC
4 Where water pressure sound waves may exceed 30 kPa, isolation methods must be implemented to prevent fish and wildlife from entering the work area.	PGC
5 Monitoring underwater sound wave levels must be conducted continuously and within 10 meters of the pile being driven to ensure levels do not exceed 30 kPa. The construction with timber piles does not require underwater sound monitoring.	PGC
6 In the event that distressed, injured or dead fish are observed following the initiation of pile driving, work shall halt immediately and the holder of this Approval or appropriate designate must contact the Water Manager as soon as practicable for additional requirements before work is resumed.	PGC
mm The holder of this Approval shall be responsible for the repair, operation and maintenance of works to the satisfaction of the Water Manager.	PGC
nn The holder of this Approval must provide a detailed post-construction report no later than December 1 of the year works were completed. The report must be labelled with this Approval file number and labelled in the subject line of the email and submitted to SouthCoastWSARreporting@gov.bc.ca . That report shall include a signed statement from an appropriately Qualified Professional summarizing	PGC
1 The in-stream works undertaken,	PGC
2 The timing of those works,	PGC
3 The total in-stream area directly affected,	PGC
4 The volume of gravel or sediment removed (if applicable),	PGC
5 The frequency of monitoring including who the QP or EM was;	PGC
6 The turbidity reporting and accompanying data along with a description of any levels higher than the authorization and what immediate steps were taken (if applicable),	PGC
7 Representative site photographs;	PGC
8 Whether or not they observed or were otherwise aware of any non-compliance with the terms and conditions of this Approval; and	PGC
9 A description of any environmental incidents, non-compliance or other difficulties, and how these were addressed and reported.	PGC
oo The holder of this Approval must retain an appropriately Qualified Professional to design, implement and report on the effectiveness of mitigation, restoration, and/or offsetting measures required in this Approval. The effectiveness monitoring term required for this approval is 10 years, ending on Dec. 31, 2033, or 10 years following the completion of construction, whichever is later. Monitoring for riparian, instream, and wetland habitats should occur on years 1, 2, 3, 6, 7, and 10. Effectiveness Monitoring Reports shall be submitted no later than December 1 of each calendar year for the duration of monitoring. The reports shall be submitted via email to SouthCoastWSARreporting@gov.bc.ca , with the approval file number listed in the report and the subject line of the email. The reports shall include	Brybil Development, PGC Implementation
1 Documentation (including photographs) and summary of the survival of planted trees and shrubs. Tree survival rates must be 100%. Shrub and other plant survival rates must exceed 80%. Replanting may be required to achieve this success rate. If the area is susceptible to invasive species, the riparian planting plan should be modified to include a denser plant spacing as well as additional monitoring and maintenance to ensure an adequate plant survival rate of 80% can be achieved. It is recommended that trees and shrubs be protected from beavers and voles with metal fencing and vole guards, respectively.	Province
2 Observation and documentation (including photographs) related to flows and function of the restored or new channel and its features.	Province

3 Fish presence, species composition, and if fish stranding is occurring within the newly constructed channel.	Province
4 Amphibian species presence by egg mass surveys,	Province
5 Recommendations for adaptive management, such as additional channel complexing or modifications if required, to address habitat limitations such as insufficient flows, fish stranding, etc.,	Province
6 Monitoring, maintenance and implementation of the above recommendations if required.	Province
7 Water quality monitoring including temperature, pH, Dissolved Oxygen, and turbidity.	Province
pp To address the permanent in stream and riparian impacts associated with the project, the holder of this Approval must	
1 Retain one or more appropriately qualified professionals to develop an offsetting plan that includes	
i	
The creation of a minimum of 206 m2 of instream, 2,705 m2 of wetland, and 1,082 m2 riparian habitat that is like for like, or like for better habitat, in terms of structure, functionality (e.g., flow regime), and target species. If the actual instream, wetland, and or riparian impact area is larger than estimated in "Environmental Enhancement Management Plan Hwy 91/17 Upgrade Project, Delta, BC. Submitted to Pacific Gateway Constructors prepared by Brybil Projects Ltd. Dated June, 2020" the compensation works must offset the actual area lost using the above stated like for like or like for better guidelines.	Brybil/PGC
ii A post-construction monitoring plan of the compensation works over 10 years following the completion of the offsetting measures.	Province
iii A commitment to prepare and submit annual post-construction monitoring reports at the end of every year of the monitoring program. A final monitoring report must be submitted upon completion of the annual monitoring program or upon reaching the survivorship and/or functionality requirements if these were not met during the monitoring program.	Province
2 Develop the offsetting plan in collaboration with interested First Nations and the Ministry of Forests, Lands, and Natural Resource Operations and Rural Development.	Brybil/PGC
3 Submit an amendment to this approval, or a new Change Approval or a Water License, whichever is applicable to the offsetting proposal, to authorize the construction of the offsetting works. This application must be submitted to Front Counter BC and the tracking number must be provided to WaterActReferrals.LowerMainland@gov.bc.ca no later than December 31, 2020, unless otherwise specified in writing by the Water Manager.	Brybil/PGC

WSA Approval 2007783 Change Approval - Changes in and About East West Perimeter Ditch and Burns Bog [Site F]

Legend
Difference between Approval 2007795 & 2007783
Difference between Approval 2007749 & 2007783
Difference between Approval 2007770 & 2007783
Difference between Approval 2007755 & 2007783

Conditions	Responsibility
If land clearing is to occur within the breeding bird period (March 30 to August 16 in Zone A1, which includes the Lower Mainland and Fraser Valley), a nest survey must be conducted and a 10m no-clearing buffer placed around the nest until the nest is determined to be no longer active.	
d The work(s) authorized in this Approval shall be completed on or before Dec. 31, 2023.	
e All works associated with the Environmental Enhancement Management Plan, as outlined in clause (m) and requirements in clause (jj) below, shall be completed on or before December 31, 2033 (based on 10 years).	
f Work in the stream and stream channel shall occur only during the periods outlined below, so that the fisheries interests are protected	
1 Instream work during the reduced risk instream work window shall occur during the period of August 1 to September 15; or	
2 Based on project justification and risk, instream work outside of the reduced risk instream work window (as stated above), subject to the following	
i An appropriately qualified professional shall provide advice to the holder of this Approval on the timing of the work based on the nature of the works, environmental values (including fish, amphibians, wildlife, any listed species present), water quality, channel stability, weather conditions, water levels, and any other relevant factors); and	
ii The Qualified Professional shall also provide additional construction mitigation advice to the holder of this Approval, and daily or full-time supervision of all work in or near the stream; and	
iii Work must be timed and planned appropriately, the stream must be completely dry or have marginal flows for the duration of the construction activities; and	
iv The advice of the Qualified Professional on construction timing (as per (i) above) and mitigation measures (as per (ii) above), as well as the timing of work and the presence of the Qualified Professional, must be documented in writing. This documentation must be submitted as part of the post construction reporting for this project.	
g All machinery and equipment operating within the stream shall be clean, free of external grease, oil or fluid leaks and shall use biodegradable grease, oil and fluids.	
h Fuelling and servicing of vehicles and equipment must occur a minimum of 30 metres away from all streams, lakes and waterbodies. Keep a spill containment kit on site and train onsite staff in its use. Immediately report any spill of a substance that is toxic, polluting, or deleterious to aquatic life of reportable quantities to the Dangerous Goods Incident Report 24-hour phone line at 1-800-663-3456.	
i The works shall not result in depressions that have the ability to trap fish and other aquatic life.	
j The holder of this approval shall take reasonable care to avoid damaging any land, works, trees, or other property and shall make full compensation to the owners for any damage or loss resulting from the exercise of the rights granted with this approval.	
k Riparian areas which are disturbed by the works shall be restored to their original condition and protected from erosion.	
l All material utilized during construction shall be contained and placed in a stable area such that it is not able to mobilize and managed to avoid entry into any stream or watercourse.	
m All works shall be completed in accordance with	
1 Reference ENG DWGs Site F Key Plan/Drawing Index 2020-02-14; Plan 2020-02-14; Profiles 2020-02-14; Typical sections 2020-02-14; Culvert Plan and Profiles, 2020-02-14	
2 Report Section 11 Approval Application Highway 91/17 Upgrades, Section 3, Site F, By Brybil Projects Ltd., February 28, 2020	
3 Stormwater Management Plan, McElhanney May 6, 2020	
4 CEMP, 3rd Revision, May 2020	
5 Surface Water Quality & Sediment Control Plan (of CEMP)	
6 Fisheries Habitat Mitigation and Compensation Plan (of CEMP)	
7 Environmental Enhancement Management Plan (EEMP), Brybil Projects Ltd., June 2020	
8 Memo Additional FLNRO information, Dave Hayward, Brybil, June 8, 2020	
The holder of this approval must adhere to the standards of professional accountability, as signed off by Qualified Professional(s), Dave Hayward and Rob Hoogendorn on June 2, 2020, regarding the Key Aquatic	
n Habitat Questions for Qualified Professionals specific to Bank Erosion Protection and Stream Diversion/in-filling, on behalf of the holder of this approval. It is the responsibility of the holder of this Approval to retain an appropriately qualified professional(s) for the relevant duration of works in order to uphold this signed professional assessment.	
o All work shall be carried out in accordance with the Provincial "Standards and Best Practices for In-stream Works" (2004). The Provincial guidance document can be found at the following link http://www.env.gov.bc.ca/wld/documents/bmp/iswstdsbpsmarch2004.pdf .	
p The holder of this Approval must hire an appropriately Qualified Professional to conduct Environmental Monitoring on all in-stream works authorized under this Approval. The Qualified Professional must be an applied scientist or technologist, acting alone or together with another qualified professional. He or she must be registered and in good standing in British Columbia with an appropriate professional organization constituted under an Act, acting under that association's code of ethics and subject to disciplinary action by that association. The Qualified Professional is responsible for observing the methods of construction and preparing information and reports on the compliance of the construction activities. The Qualified Professional shall	
1 Ensure all best management practices and mitigation measures are in place to avoid and minimize environmental impact on the land and on fish and fish habitat of the stream.	
2 Where applicable, assist in the isolation of the stream prior to the commencement of works.	
3 Implement and ensure erosion and sediment control measures are constructed, installed, and maintained appropriately for the full duration of instream works.	
4 Supervise all instream works authorized under this Approval.	
5 When the works involve temporary diversions to isolate the work site,	
i Monitor all diversion works daily to ensure pumps & flow bypasses are in proper working condition;	
ii Ensure diversion works that include pump intakes be screened for fish and aquatic species in accordance with the "Interim code of practice End-of-pipe fish protection screens for small water intakes in freshwater" (Fisheries and Oceans Canada, 2020); and	
iii Ensure fish are prevented from entering the works.	
6 When the works involve dewatering or isolation of flow and the stream is known or suspected to contain fish and/or amphibians,	
i Attend the site prior to conducting any instream works to complete fish and wildlife search and salvages;	
ii Obtain any permits needed prior to undertaking the salvage(s); and	
iii Inspect the extraction area for fish stranding at least once after water levels have declined.	
7 In the event of an environmental incident or non-compliance with any of the terms or conditions of this Approval, notify the Water Manager (SouthCoastWSAReporting@gov.bc.ca), within 24 hours.	
8 Be granted authority to stop the work authorized under this Approval if deemed necessary to address risks to the environment. The Qualified Professional or their designate (specified in writing) must be on site during all phases of construction in and around the stream to ensure this component is upheld.	
q Upon commencement of the project, the work shall be pursued to completion as quickly as possible.	
r All equipment and machinery used in or near the stream channel	
1 Must be in good operating condition and free of leaks, excess oil and grease;	
2 Must have a spill containment kit readily accessible on-site;	
3 May not be refuelled within 30 meters of any watercourse; and	
4 Must use environmentally sensitive hydraulic fluids which are non-toxic to aquatic life and which are readily or inherently bio-degradable.	

	<p>Sediment and Erosion Control measures to prevent the release of silt, sediment or sediment-laden water must be in place before starting works that may result in sediment mobilization. Care shall be exercised during all phases of the work to prevent the release of silt, sediment, sediment-laden water, raw concrete, concrete leachate or any deleterious substances. All control measures must meet or surpass the Provincial "Standards and Best Practices for In-stream Works" (2004) and the "Land Development Guidelines for the Protection of Aquatic Habitat" (Fisheries and Oceans Canada and the British Columbia, 1993).</p>	
t	<p>Sediment removal boundaries must be clearly delineated prior to commencement of work. All sediment excavation for removal purposes shall be completed in isolation of the stream flows.</p>	
u	<p>Discharge and runoff water from the site into any watercourse(s) must comply with the BC Approved Water Quality Guidelines for the Protection of Aquatic Life (https://www2.gov.bc.ca/gov/content/environment/air-land-water/water/water-quality/water-quality-guidelines/approved-water-quality-guidelines and https://www2.gov.bc.ca/assets/gov/environment/air-land-water/water/waterquality/wqgs-wqos/approved-wqgs/turbidity-or.pdf) and/or the applicable Local Government Bylaw(s).</p> <p>Water quality monitoring must be conducted by an appropriately qualified professional or their designated Environmental Monitor on every day in which instream works are being conducted. Measurements must be taken upstream of any works taking place and within the extent of the sedimentation downstream of where instream work is actively occurring. Measurements should be taken immediately prior to works beginning, and then at regular intervals until the works are completed and may require additional frequency during wet weather conditions. Wet weather conditions will be defined as being equal to or greater than 25 millimetres of rainfall within a 24 hour period.</p>	
v	<p>All excavated material and debris shall be removed from the site or placed in a stable area above the high water mark of the stream. Mitigative measures must be applied to protect the excavated material and debris from erosion and reintroduction into the watercourse. These measures may include covering the material with erosion blankets, seeding and planting with native vegetation, or as otherwise directed by a Qualified Professional.</p>	
w	<p>All material utilized during construction shall be contoured and placed in a stable area such that it is not able to mobilize and managed to avoid entry into any stream or watercourse.</p>	
x	<p>Site preparation and construction of the works is to be carried out from the banks of the stream, thus minimizing disturbance to the stream.</p>	
y	<p>The holder of this Approval shall ensure that instream works are designed and installed so as not to restrict fish passage and/or lead to fish stranding.</p>	
z	<p>All temporary works (including a ford, stream crossing and flow bypass) shall be removed on completion of the project, and the stream channel restored to its natural condition.</p>	
aa	<p>Vegetation along the banks of the stream shall be disturbed as little as possible. All disturbed areas must be restored using native vegetation that is suitable for the site conditions.</p>	
bb	<p>The new channel of the stream must have greater or equal hydraulic capacity than the existing channel.</p>	
cc	<p>The hydraulic capacity of installed culvert(s) must be equivalent to the hydraulic capacity of the stream channel or be capable of passing the 1 in 200 year maximum daily flow without the water level at the culvert(s) inlet exceeding the top of the culvert(s).</p>	
dd	<p>Rock used as riprap shall be clean of any substances deleterious to aquatic life and shall be durable, angular in shape and suitably graded and sized to resist movement by stream flow. Any other engineering material required for the construction of the works shall be clean of any substances deleterious to aquatic life.</p>	
ee	<p>Treated wood products shall not be used in any construction below the high-water mark of the stream channel.</p>	
ff	<p>Large woody debris and the stubs of large diameter trees must be left in place or retained on-site where it is safe to do so.</p>	
gg	<p>Care shall be exercised during pile driving to minimize potential adverse impacts to fish or wildlife. The following mitigation measures shall be implemented</p> <ol style="list-style-type: none"> 1 Where possible and feasible, piles should be installed using a vibratory hammer. 2 Piles installed using an impact hammer must implement mitigation measures to reduce water pressure sound waves in excess of 30 kilopascals (kPa). 3 Mitigation measures such as bubble curtains, double wall piles, or isolation methods shall be implemented to avoid adverse impacts to fish. 4 Where water pressure sound waves may exceed 30 kPa, isolation methods must be implemented to prevent fish and wildlife from entering the work area. 5 Monitoring underwater sound wave levels must be conducted continuously and within 10 meters of the pile being driven to ensure levels do not exceed 30 kPa. The construction with timber piles does not require underwater sound monitoring. 6 In the event that distressed, injured or dead fish are observed following the initiation of pile driving, work shall halt immediately and the holder of this Approval or appropriate designate must contact the Water Manager as soon as practicable for additional requirements before work is resumed. 	
hh	<p>The holder of this Approval must provide a detailed post-construction report no later than December 1 of the year works were completed. The report must be labelled with this Approval file number and labelled in the subject line of the email and submitted to SouthCoastWSAReporting@gov.bc.ca.</p> <p>That report shall include a signed statement from an appropriately Qualified Professional summarizing</p> <ol style="list-style-type: none"> 1 The in-stream works undertaken, 2 The timing of those works, 3 The total in-stream area directly affected, 4 The volume of gravel or sediment removed (if applicable), 5 The frequency of monitoring including who the QP or EM was; 6 The turbidity reporting and accompanying data along with a description of any levels higher than the authorization and what immediate steps were taken (if applicable), 7 Representative site photographs, 8 Whether or not they observed or were otherwise aware of any non-compliance with the terms and conditions of this Approval; and 9 A description of any environmental incidents, non-compliance or other difficulties, and how these were addressed and reported. 	
ii	<p>The holder of this Approval must retain an appropriately Qualified Professional to design, implement and report on the effectiveness of mitigation, restoration, and/or offsetting measures required in this Approval. The effectiveness monitoring term required for this approval is 10 years, ending on Dec. 31, 2033, or 10 years following the completion of construction, whichever is later. Monitoring for riparian, instream, and wetland habitats should occur on years 1, 2, 3, 6, 7, and 10.</p> <p>Effectiveness Monitoring Reports shall be submitted no later than December 1 of each calendar year for the duration of monitoring. The reports shall be submitted via email to SouthCoastWSAReporting@gov.bc.ca, with the approval file number listed in the report and the subject line of the email.</p> <p>The reports shall include</p> <ol style="list-style-type: none"> 1 Documentation (including photographs) and summary of the survival of planted trees and shrubs. Tree survival rates must be 100%. Shrub and other plant survival rates must exceed 80%. Replanting may be required to achieve this success rate. If the area is susceptible to invasive species, the riparian planting plan should be modified to include a denser plant spacing as well as additional monitoring and maintenance to ensure an adequate plant survival rate of 80% can be achieved. It is recommended that trees and shrubs be protected from beavers and voles with metal fencing and vole guards, respectively. 2 Observation and documentation (including photographs) related to flows and function of the restored or new channel and its features. 3 Fish presence, species composition, and if fish stranding is occurring within the newly constructed channel. 4 Amphibian species presence by egg mass surveys, 5 Recommendations for adaptive management, such as additional channel complexing or modifications if required, to address habitat limitations such as insufficient flows, fish stranding, etc., 6 Monitoring, maintenance and implementation of the above recommendations if required. 7 Water quality monitoring including temperature, pH, Dissolved Oxygen, and turbidity. 	
jj	<p>To address the permanent instream and riparian impacts associated with the project, the holder of this Approval must</p> <ol style="list-style-type: none"> 1 Retain one or more appropriately qualified professionals to develop an offsetting plan that includes <p>The creation of a minimum of 382 m2 of instream, 21,648 m2 of wetland, and 52 m2 riparian habitat that is like for like, or like for better habitat, in terms of structure, functionality (e.g., flow regime), and target species. If the actual instream, wetland, and/or riparian impact area is larger than estimated in "Environmental Enhancement Management Plan Hwy 91/17 Upgrade Project, Delta, BC. Submitted to Pacific Gateway Constructors prepared by Brybil Projects Ltd. Dated June, 2020" the compensation works must offset the actual area lost using the above stated like for like or like for better guidelines.</p> <p>A post-construction monitoring plan of the compensation works over 10 years following the completion of the offsetting measures. Monitoring must take place during the same time of year each year to provide comparable data. Monitoring of plant survival in riparian and wetland areas and of instream areas should be scheduled during the summer, during a period between high and low water (likely July). Results of initial monitoring will determine how much further monitoring may be required until enhancement habitats are self-sustaining.</p>	

<p>iii A commitment to prepare and submit annual post-construction monitoring reports at the end of every year of the monitoring program. A final monitoring report must be submitted upon completion of the annual monitoring program or upon reaching the survivorship and/or functionality requirements if these were not met during the monitoring program.</p> <p>2 Develop the offsetting plan in collaboration with interested First Nations, local governments, and the Ministry of Forests, Lands, and Natural Resource Operations and Rural Development.</p> <p>3 Submit an amendment to this approval, or a new Change Approval or a Water License, whichever is applicable to the offsetting proposal, to authorize the construction of the offsetting works. This application must be submitted to Front Counter BC and the tracking number must be provided to WaterActReferrals.LowerMainland@gov.bc.ca no later than December 31, 2020, unless otherwise specified in writing by the Water Manager.</p>	
<p>kk Effectiveness monitoring must take place during the same time of year each year to provide comparable data.</p> <p>Monitoring of plant survival in riparian and wetland areas and of instream areas should be scheduled during the summer, during a period between high and low water (likely July). Targets include</p> <p>1 Plant survival is $\geq 80\%$; Tree survival rate of 100 %.</p> <p>2 Native plant cover is two thirds greater than invasive species cover within 5 years;</p> <p>3 Visual survey of LWD and boulders to confirm they are in place and intact, and that boulders are effectively creating riffles and pools, creating cover for fish and habitat for amphibians; and</p> <p>4 Fish are present in instream areas and there are no new barriers to movement.</p>	

WSA Approval 2007749 Change Approval - Changes In and About a Stream (Site G)
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Legend
Difference between Approval 2007795 & 2007749
Difference between Approval 2007783 & 2007749
Difference between Approval 2007770 & 2007749
Difference between Approval 2007755 & 2007749

Conditions	Responsibility
if land clearing is to occur within the breeding bird period (March 30 to August 16 in Zone A1, which includes the Lower Mainland and Fraser Valley), a nest survey must be conducted and a 10m no-clearing buffer placed around the nest until the nest is determined to be no longer active.	
d The work(s) authorized in this Approval shall be completed on or before Dec. 31, 2023.	
e All works associated with the Environmental Enhancement Management Plan, as outlined in clause (m) and requirements in clause (jj) below, shall be completed on or before December 31, 2033 (based on 10 years).	
f Work in the stream and stream channel shall occur only during the periods outlined below, so that the fisheries interests are protected	
1 Instream work during the reduced risk instream work window shall occur during the period of August 1 to September 15; or	
2 Based on project justification and risk, instream work outside of the reduced risk instream work window (as stated above), subject to the following	
i An appropriately qualified professional shall provide advice to the holder of this Approval on the timing of the work based on the nature of the works, environmental values (including fish, amphibians, wildlife, any listed species present), water quality, channel stability, weather conditions, water levels, and any other relevant factors); and	
ii The Qualified Professional shall also provide additional construction mitigation advice to the holder of this Approval, and daily or full-time supervision of all work in or near the stream; and	
iii Work must be timed and planned appropriately, the stream must be completely dry or have marginal flows for the duration of the construction activities; and	
iv The advice of the Qualified Professional on construction timing (as per (i) above) and mitigation measures (as per (ii) above), as well as the timing of work and the presence of the Qualified Professional, must be documented in writing. This documentation must be submitted as part of the post construction reporting for this project.	
g All machinery and equipment operating within the stream shall be clean, free of external grease, oil or fluid leaks and shall use biodegradable grease, oil and fluids.	
h Fuelling and servicing of vehicles and equipment must occur a minimum of 30 metres away from all streams, lakes and waterbodies. Keep a spill containment kit on site and train onsite staff in its use. Immediately report any spill of a substance that is toxic, polluting, or deleterious to aquatic life of reportable quantities to the Dangerous Goods Incident Report 24-hour phone line at 1-800-663-3456.	
i The works shall not result in depressions that have the ability to trap fish and other aquatic life.	
j The holder of this approval shall take reasonable care to avoid damaging any land, works, trees, or other property and shall make full compensation to the owners for any damage or loss resulting from the exercise of the rights granted with this approval.	
k Riparian areas which are disturbed by the works shall be restored to their original condition and protected from erosion.	
l All material utilized during construction shall be contoured and placed in a stable area such that it is not able to mobilize and managed to avoid entry into any stream or watercourse.	
m All works shall be completed in accordance with	
1 Reference ENG DWGs Site G Key Plan/Drawing Index 2020-02-14; Plan 2020-02-14; Profiles 2020-02-14; Typical sections 2020-02-14; Culvert Plan and Profiles, 2020-02-14	
2 Report Section 11 Approval Application Highway 91/17 Upgrades, Section 4, Site G, By Brybil Projects Ltd., February 28, 2020	
3 Stormwater Management Plan, McElhanney May 6, 2020	
4 CEMP, 3rd Revision, May 2020	
5 Surface Water Quality & Sediment Control Plan (of CEMP)	
6 Fisheries Habitat Mitigation and Compensation Plan (of CEMP)	
7 Environmental Enhancement Management Plan (EEMP), Brybil Projects Ltd., June 2020	
8 Memo Additional FLNRO Information, Dave Hayward, Brybil, June 8, 2020	
n The holder of this approval must adhere to the standards of professional accountability, as signed off by Qualified Professional(s), Dave Hayward and Rob Hoogendorn on June 2, 2020, regarding the Key Aquatic Habitat Questions for Qualified Professionals specific to Bank Erosion Protection and Stream Diversion/In-filling, on behalf of the holder of this approval. It is the responsibility of the holder of this Approval to retain an appropriately qualified professional(s) for the relevant duration of works in order to uphold this signed professional assessment.	
o All work shall be carried out in accordance with the Provincial "Standards and Best Practices for In-stream Works" (2004). The Provincial guidance document can be found at the following link http://www.env.gov.bc.ca/wld/documents/bmp/iswstdsbpsmarch2004.pdf .	
p The holder of this Approval must hire an appropriately Qualified Professional to conduct Environmental Monitoring on all in-stream works authorized under this Approval. The Qualified Professional must be an applied scientist or technologist, acting alone or together with another qualified professional. He or she must be registered and in good standing in British Columbia with an appropriate professional organization constituted under an Act, acting under that association's code of ethics and subject to disciplinary action by that association. The Qualified Professional is responsible for observing the methods of construction and preparing information and reports on the compliance of the construction activities. The Qualified Professional shall	
1 Ensure all best management practices and mitigation measures are in place to avoid and minimize environmental impact on the land and on fish and fish habitat of the stream.	
2 Where applicable, assist in the isolation of the stream prior to the commencement of works.	
3 Implement and ensure erosion and sediment control measures are constructed, installed, and maintained appropriately for the full duration of instream works.	
4 Supervise all instream works authorized under this Approval.	
5 When the works involve temporary diversions to isolate the work site,	
i Monitor all diversion works daily to ensure pumps & flow bypasses are in proper working condition;	
ii Ensure diversion works that include pump intakes be screened for fish and aquatic species in accordance with the "Interim code of practice End-of-pipe fish protection screens for small water intakes in freshwater" (Fisheries and Oceans Canada, 2020); and	
iii Ensure fish are prevented from entering the works.	
6 When the works involve dewatering or isolation of flow and the stream is known or suspected to contain fish and/or amphibians,	
i Attend the site prior to conducting any instream works to complete fish and wildlife search and salvages;	
ii Obtain any permits needed prior to undertaking the salvage(s); and	
iii Inspect the extraction area for fish stranding at least once after water levels have declined.	
7 In the event of an environmental incident or non-compliance with any of the terms or conditions of this Approval, notify the Water Manager (SouthCoastWSAReporting@gov.bc.ca), within 24 hours.	
8 Be granted authority to stop the work authorized under this Approval if deemed necessary to address risks to the environment. The Qualified Professional or their designate (specified in writing) must be on site during all phases of construction in and around the stream to ensure this component is upheld.	
q Upon commencement of the project, the work shall be pursued to completion as quickly as possible.	
r All equipment and machinery used in or near the stream channel	
1 Must be in good operating condition and free of leaks, excess oil and grease;	
2 Must have a spill containment kit readily accessible on-site;	
3 May not be refuelled within 30 meters of any watercourse; and	
4 Must use environmentally sensitive hydraulic fluids which are non-toxic to aquatic life and which are readily or inherently bio-degradable.	

	<p>Sediment and Erosion Control measures to prevent the release of silt, sediment or sediment-laden water must be in place before starting works that may result in sediment mobilization. Care shall be exercised during all phases of the work to prevent the release of silt, sediment, sediment-laden water, raw concrete, concrete leachate or any deleterious substances. All control measures must meet or surpass the Provincial "Standards and Best Practices for In-stream Works" (2004) and the "Land Development Guidelines for the Protection of Aquatic Habitat" (Fisheries and Oceans Canada and the British Columbia, 1993).</p>	
t	<p>Sediment removal boundaries must be clearly delineated prior to commencement of work. All sediment excavation for removal purposes shall be completed in isolation of the stream flows.</p>	
u	<p>Discharge and runoff water from the site into any watercourse(s) must comply with the BC Approved Water Quality Guidelines for the Protection of Aquatic Life (https://www2.gov.bc.ca/gov/content/environment/air-land-water/water/water-quality/water-quality-guidelines/approved-water-quality-guidelines and https://www2.gov.bc.ca/assets/gov/environment/air-land-water/water/waterquality/wqgs-wqos/approved-wqgs/turbidity-or.pdf) and/or the applicable Local Government Bylaw(s).</p> <p>Water quality monitoring must be conducted by an appropriately qualified professional or their designated Environmental Monitor on every day in which instream works are being conducted. Measurements must be taken upstream of any works taking place and within the extent of the sedimentation downstream of where instream work is actively occurring. Measurements should be taken immediately prior to works beginning, and then at regular intervals until the works are completed and may require additional frequency during wet weather conditions. Wet weather conditions will be defined as being equal to or greater than 25 millimetres of rainfall within a 24 hour period.</p>	
v	<p>All excavated material and debris shall be removed from the site or placed in a stable area above the high water mark of the stream. Mitigative measures must be applied to protect the excavated material and debris from erosion and reintroduction into the watercourse. These measures may include covering the material with erosion blankets, seeding and planting with native vegetation, or as otherwise directed by a Qualified Professional.</p>	
w	<p>All material utilized during construction shall be contoured and placed in a stable area such that it is not able to mobilize and managed to avoid entry into any stream or watercourse.</p>	
x	<p>Site preparation and construction of the works is to be carried out from the banks of the stream, thus minimizing disturbance to the stream.</p>	
y	<p>The holder of this Approval shall ensure that instream works are designed and installed so as not to restrict fish passage and/or lead to fish stranding.</p>	
z	<p>All temporary works (including a ford, stream crossing and flow bypass) shall be removed on completion of the project, and the stream channel restored to its natural condition.</p>	
aa	<p>Vegetation along the banks of the stream shall be disturbed as little as possible. All disturbed areas must be restored using native vegetation that is suitable for the site conditions.</p>	
bb	<p>The new channel of the stream must have greater or equal hydraulic capacity than the existing channel.</p>	
cc	<p>The hydraulic capacity of installed culvert(s) must be equivalent to the hydraulic capacity of the stream channel or be capable of passing the 1 in 200 year maximum daily flow without the water level at the culvert(s) inlet exceeding the top of the culvert(s).</p>	
dd	<p>Rock used as riprap shall be clean of any substances deleterious to aquatic life and shall be durable, angular in shape and suitably graded and sized to resist movement by stream flow. Any other engineering material required for the construction of the works shall be clean of any substances deleterious to aquatic life.</p>	
ee	<p>Treated wood products shall not be used in any construction below the high-water mark of the stream channel.</p>	
ff	<p>Large woody debris and the stubs of large diameter trees must be left in place or retained on-site where it is safe to do so.</p>	
gg	<p>Care shall be exercised during pile driving to minimize potential adverse impacts to fish or wildlife. The following mitigation measures shall be implemented</p> <ol style="list-style-type: none"> Where possible and feasible, piles should be installed using a vibratory hammer or helical (screw) method. Piles installed using an impact hammer must implement the following mitigation measures to reduce water pressure sound waves in excess of 30 kilopascals (kPa) <ol style="list-style-type: none"> Mitigation measures such as bubble curtains, double wall piles, or isolation methods shall be implemented to avoid adverse impacts to fish. Where water pressure sound waves may exceed 30 kPa, isolation methods must be implemented to prevent fish and wildlife from entering the work area. Monitoring underwater sound wave levels must be conducted continuously and within 10 meters of the pile being driven to ensure levels do not exceed 30 kPa. The construction with timber piles does not require underwater sound monitoring. In the event that distressed, injured or dead fish are observed following the initiation of pile driving, work shall halt immediately and the holder of this Approval or appropriate designate must contact the Water Manager as soon as practicable for additional requirements before work is resumed. 	
hh	<p>The holder of this Approval must provide a detailed post-construction report no later than December 1 of the year works were completed. The report must be labelled with this Approval file number and labelled in the subject line of the email and submitted to SouthCoastWSAREporting@gov.bc.ca. That report shall include a signed statement from an appropriately Qualified Professional summarizing</p> <ol style="list-style-type: none"> The in-stream works undertaken, The timing of those works, The total in-stream area directly affected, The volume of gravel or sediment removed (if applicable), The frequency of monitoring including who the OP or EM was; The turbidity reporting and accompanying data along with a description of any levels higher than the authorization and what immediate steps were taken (if applicable), Representative site photographs; Whether or not they observed or were otherwise aware of any non-compliance with the terms and conditions of this Approval; and A description of any environmental incidents, non-compliance or other difficulties, and how these were addressed and reported. 	
ii	<p>The holder of this Approval must retain an appropriately Qualified Professional to design, implement and report on the effectiveness of mitigation, restoration, and/or offsetting measures required in this Approval. The effectiveness monitoring term required for this approval is 10 years, ending on Dec. 31, 2033, or 10 years following the completion of construction, whichever is later. Monitoring for riparian, instream, and wetland habitats should occur on years 1, 2, 3, 6, 7, and 10. Effectiveness Monitoring Reports shall be submitted no later than December 1 of each calendar year for the duration of monitoring. The reports shall be submitted via email to SouthCoastWSAREporting@gov.bc.ca, with the approval file number listed in the report and the subject line of the email. The reports shall include</p> <ol style="list-style-type: none"> Documentation (including photographs) and summary of the survival of planted trees and shrubs. Tree survival rates must be 100%. Shrub and other plant survival rates must exceed 80%. Replanting may be required to achieve this success rate. If the area is susceptible to invasive species, the riparian planting plan should be modified to include a denser plant spacing as well as additional monitoring and maintenance to ensure an adequate plant survival rate of 80% can be achieved. It is recommended that trees and shrubs be protected from beavers and voles with metal fencing and vole guards, respectively. Observation and documentation (including photographs) related to flows and function of the restored or new channel and its features. Fish presence, species composition, and if fish stranding is occurring within the newly constructed channel. Amphibian species presence by egg mass surveys, Recommendations for adaptive management, such as additional channel complexing or modifications if required, to address habitat limitations such as insufficient flows, fish stranding, etc., Monitoring, maintenance and implementation of the above recommendations if required. Water quality monitoring including temperature, pH, Dissolved Oxygen, and turbidity. 	
jj	<p>To address the permanent instream and riparian impacts associated with the project, the holder of this Approval must</p> <ol style="list-style-type: none"> Retain one or more appropriately Qualified Professionals to develop an offsetting plan that includes <ul style="list-style-type: none"> The creation of a minimum of, 7,617 m² of wetland habitat that is like for like, or like for better habitat, in terms of structure, functionality (e.g., flow regime), and target species. If the actual instream, wetland, and/or riparian impact area is larger than estimated in "Environmental Enhancement Management Plan Hwy 91/17 Upgrade Project, Delta, BC. Submitted to Pacific Gateway Constructors prepared by Brybil Projects Ltd. Dated June, 2020" the compensation works must offset the actual area lost using the above stated like for like or like for better guidelines. A post-construction monitoring plan of the compensation works over 10 years following the completion of the offsetting measures. A commitment to prepare and submit annual post-construction monitoring reports at the end of every year of the monitoring program. A final monitoring report must be submitted upon completion of the annual monitoring program or upon reaching the survivorship and/or functionality requirements if these were not met during the monitoring program. Develop the offsetting plan in collaboration with interested First Nations, local governments, and the Ministry of Forests, Lands, and Natural Resource Operations and Rural Development. 	

<p>Submit an amendment to this approval, or a new Change Approval or a Water License, whichever is applicable to the offsetting proposal, to authorize the construction of the offsetting works. This application must be submitted to Front Counter BC and the tracking number must be provided to WaterActReferrals.LowerMainland@gov.bc.ca no later than December 31, 2020, unless otherwise specified in writing by the Water Manager.</p>	
<p>kk Effectiveness monitoring must take place during the same time of year each year to provide comparable data. Monitoring of plant survival in riparian and wetland areas and of instream areas should be scheduled during the summer, during a period between high and low water (likely July). Targets include</p> <ol style="list-style-type: none"> 1 Plant survival is $\geq 80\%$; Tree survival rate of 100 %. 2 Native plant cover is two thirds greater than invasive species cover within 5 years; 3 Visual survey of LWD and boulders to confirm they are in place and intact, and that boulders are effectively creating riffles and pools and creating cover for fish and habitat for amphibians; and 5 Fish are present in instream areas and there are no new barriers to movement 	

WSA Approval 2007770
Change Approval - Changes in and About a Stream (Site I)

Conditions	Responsibility
if land clearing is to occur within the breeding bird period (March 30 to August 16 in Zone A1, which includes the Lower Mainland and Fraser Valley), a nest survey must be conducted and a 10m no-clearing buffer placed around the nest until the nest is determined to be no longer active.	
if it is possible amphibians may be present in the streams, such as Nordel Ditches, an amphibian salvage must be undertaken prior to works taking place.	
d The works authorized shall be completed on or before December 31, 2023.	
e All works associated with an authorized Environmental Enhancement Management Plan, as outlined in clause (n) and required in clause (ff) below shall be completed on or before December 31, 2033 (based on 10 years).	
f Work in the stream and stream channel shall occur only during the periods outlined below, so that the fisheries interests are protected	
1 Instream work during the reduced risk instream work window shall occur during the period of August 1 to September 30; or	
2 Based on project justification and risk, instream work outside of the reduced risk instream work window (as stated above), subject to the following	
i An appropriately qualified professional shall provide advice to the holder of this Approval on the timing of the work based on the nature of the works, environmental values (including fish, amphibians, wildlife, any listed species present), water quality, channel stability, weather conditions, water levels, and any other relevant factors; and	
ii The Qualified Professional shall also provide additional construction mitigation advice to the holder of this Approval, and daily or full-time supervision of all work in or near the stream; and	
iii Work must be timed and planned appropriately, the stream must be completely dry or have marginal flows for the duration of the construction activities; and	
iv The advice of the Qualified Professional on construction timing (as per (i) above) and mitigation measures (as per (ii) above), as well as the timing of work and the presence of the Qualified Professional, must be documented in writing. This documentation must be submitted as part of the post construction reporting for this project.	
g All works shall be completed in accordance with	
1 Reference ENG DWGs Site I Plan 2020-02-27, Profiles 2020-02-27, Culvert/ Storm Plans and Profiles 2020-02-27	
2 Report Section 11 Approval Application Highway 91/17 Upgrades, Section 4, Site I, By Brybil Projects Ltd., March 10, 2020	
3 Stormwater Management Plan, McElhanney May 6, 2020	
4 CEMP, 3rd Revision, May, 2020	
5 Surface Water Quality & Sediment Control Plan (of CEMP)	
6 Fisheries Habitat Mitigation and Compensation Plan (of CEMP)	
7 Environmental Enhancement Management Plan (EEMP), Brybil Projects Ltd., June 2020	
8 Memo Additional FLNRO Information, Dave Hayward, Brybil, June 8, 2020	
h The holder of this approval must adhere to the standards of professional accountability, as signed off by Qualified Professional(s), Dave Hayward and Rob Hoogendorn on June 2, 2020, regarding the Key Aquatic Habitat Questions for Qualified Professionals specific to Bank Erosion Protection and Stream Diversion/In-filling, on behalf of the holder of this approval. It is the responsibility of the holder of this Approval to retain an appropriately qualified professional(s) for the relevant duration of works in order to uphold this signed professional assessment.	
i All work shall be carried out in accordance with the Provincial "Standards and Best Practices for In-stream Works" (2004). The Provincial guidance document can be found at the following link http://www.env.gov.bc.ca/wld/documents/bmp/bswstdbbspmarch2004.pdf .	
j The holder of this Approval must hire an appropriately Qualified Professional to conduct Environmental Monitoring on all in-stream works authorized under this Approval. The Qualified Professional must be an applied scientist or technologist, acting alone or together with another qualified professional. He or she must be registered and in good standing in British Columbia with an appropriate professional organization constituted under an Act, acting under that association's code of ethics and subject to disciplinary action by that association. The Qualified Professional is responsible for observing the methods of construction and preparing information and reports on the compliance of the construction activities. The Qualified Professional shall	
1 Ensure all best management practices and mitigation measures are in place to avoid and minimize environmental impact on the land and on fish and fish habitat of the stream.	
2 Where applicable, assist in the isolation of the stream prior to the commencement of works.	
3 Implement and ensure erosion and sediment control measures are constructed, installed, and maintained appropriately for the full duration of instream works.	
4 Supervise all instream works authorized under this Approval.	
5 When the works involve temporary diversions to isolate the work site,	
i Monitor all diversion works daily to ensure pumps & flow bypasses are in proper working condition;	
ii Ensure diversion works that include pump intakes be screened for fish and aquatic species in accordance with the "Interim code of practice End-of-pipe fish protection screens for small water intakes in freshwater" (Fisheries and Oceans Canada, 2020); and	
iii Ensure fish are prevented from entering the works.	
6 When the works involve dewatering or isolation of flow and the stream is known or suspected to contain fish and/or amphibians,	
i Attend the site prior to conducting any instream works to complete fish and wildlife search and salvages;	
ii Obtain any permits needed prior to undertaking the salvage(s); and	
iii Inspect the extraction area for fish stranding at least once after water levels have declined.	
7 In the event of an environmental incident or non-compliance with any of the terms or conditions of this Approval, notify the Water Manager (SouthCoastWSAReporting@gov.bc.ca), within 24 hours.	
8 Be granted authority to stop the work authorized under this Approval if deemed necessary to address risks to the environment. The Qualified Professional or their designate (specified in writing) must be on site during all phases of construction in and around the stream to ensure this component is upheld.	
k All equipment and machinery used in or near the stream channel	
1 Must be in good operating condition and free of leaks, excess oil and grease;	
2 Must have a spill containment kit readily accessible on-site;	
3 May not be refuelled within 30 meters of any watercourse; and	
4 Must use environmentally sensitive hydraulic fluids which are non-toxic to aquatic life and which are readily or inherently bio-degradable.	
l Fuelling and servicing of vehicles and equipment must occur a minimum of 30 metres away from all streams, lakes and waterbodies. Keep a spill containment kit on site and train onsite staff in its use. Immediately report any spill of a substance that is toxic, polluting, or deleterious to aquatic life of reportable quantities to the Dangerous Goods Incident Report 24-hour phone line at 1-800-663-3456.	
m Upon commencement of the project, the work shall be pursued to completion as quickly as possible.	
n Sediment and Erosion Control measures to prevent the release of silt, sediment or sediment-laden water must be in place before starting works that may result in sediment mobilization. Care shall be exercised during all phases of the work to prevent the release of silt, sediment, sediment-laden water, raw concrete, concrete leachate or any deleterious substances. All control measures must meet or surpass the Provincial "Standards and Best Practices for In-stream Works" (2004) and the "Land Development Guidelines for the Protection of Aquatic Habitat" (Fisheries and Oceans Canada and the British Columbia, 1993).	
o Sediment removal boundaries must be clearly delineated prior to commencement of work. All sediment excavation for removal purposes shall be completed in isolation of the stream flows.	
p All excavated material and debris shall be removed from the site or placed in a stable area above the high water mark of the stream. Mitigative measures must be applied to protect the excavated material and debris from erosion and reintroduction into the watercourse. These measures may include covering the material with erosion blankets, seeding and planting with native vegetation, or as otherwise directed by a Qualified Professional.	
q Discharge and runoff water from the site into any watercourse(s) must comply with the BC Approved Water Quality Guidelines for the Protection of Aquatic Life (https://www2.gov.bc.ca/gov/content/environment/air-land-water/water/water-quality/water-quality-guidelines/approved-water-quality-guidelines and https://www2.gov.bc.ca/assets/gov/environment/air-land-water/water/water-quality/wqgs-wqos/approved-wqgs/turbidity-or-pdf) and/or the applicable Local Government bylaw(s).	

Legend
Difference between Approval 2007795 & 2007770
Difference between Approval 2007783 & 2007770
Difference between Approval 2007749 & 2007770
Difference between Approval 2007755 & 2007749

	Water quality monitoring must be conducted by an appropriately qualified professional or their designated Environmental Monitor on every day in which instream works are being conducted. Measurements must be taken upstream of any works taking place and within the extent of the sedimentation downstream of where instream work is actively occurring. Measurements should be taken immediately prior to works beginning, and then at regular intervals until the works are completed and may require additional frequency during wet weather conditions. Wet weather conditions will be defined as being equal to or greater than 25 millimetres of rainfall within a 24 hour period.		
f	The holder of this approval shall take reasonable care to avoid damaging any land, works, trees, or other property and shall make full compensation to the owners for any damage or loss resulting from the exercise of the rights granted with this approval.		
g	Site preparation and construction of the works is to be carried out from the banks of the stream, thus minimizing disturbance to the stream.		
h	The works shall not result in depressions that have the ability to trap fish and other aquatic life.		
i	The holder of this Approval shall ensure that instream works are designed and installed so as not to restrict fish passage and/or lead to fish stranding.		
j	All temporary works (including a ford, stream crossing and flow bypass) shall be removed on completion of the project, and the stream channel restored to its natural condition.		
k	Riparian areas which are disturbed by the works shall be restored to their original condition and protected from erosion.		
l	The new channel of the stream must have greater or equal hydraulic capacity than the existing channel.		
m	The hydraulic capacity of installed culvert(s) must be equivalent to the hydraulic capacity of the stream channel or be capable of passing the 1 in 200 year maximum daily flow without the water level at the culvert(s) inlet exceeding the top of the culvert(s).		
n	Rock used as riprap shall be clean of any substances deleterious to aquatic life and shall be durable, angular in shape and suitably graded and sized to resist movement by stream flow. Any other engineering material required for the construction of the works shall be clean of any substances deleterious to aquatic life.		
o	All rock used in the works shall be clean and free of sediment producing material, durable, non-acid generating and suitably graded.		
p	Treated wood products shall not be used in any construction below the high-water mark of the stream channel.		
q	Large woody debris and the stubs of large diameter trees must be left in place or retained on-site where it is safe to do so.		
r	Care shall be exercised during pile driving to minimize potential adverse impacts to fish or wildlife. The following mitigation measures shall be implemented		
s	1 Where possible and feasible, piles should be installed using a vibratory hammer.		
t	2 Piles installed using an impact hammer must implement mitigation measures to reduce water pressure sound waves in excess of 30 kilopascals (kPa).		
u	3 Mitigation measures such as bubble curtains, double wall piles, or isolation methods shall be implemented to avoid adverse impacts to fish.		
v	4 Where water pressure sound waves may exceed 30 kPa, isolation methods must be implemented to prevent fish and wildlife from entering the work area.		
w	5 Monitoring underwater sound wave levels must be conducted continuously and within 10 meters of the pile being driven to ensure levels do not exceed 30 kPa. The construction with timber piles does not require underwater sound monitoring.		
x	6 In the event that distressed, injured or dead fish are observed following the initiation of pile driving, work shall halt immediately and the holder of this Approval or appropriate designate must contact the Water Manager as soon as practicable for additional requirements before work is resumed.		
y	The holder of this Approval must provide a detailed post-construction report no later than December 1 of the year works were completed. The report must be labelled with this Approval file number and labelled in the subject line of the email and submitted to SouthCoastWSAREporting@gov.bc.ca. That report shall include a signed statement from an appropriately Qualified Professional summarizing		
z	1 The in-stream works undertaken, 2 The timing of those works, 3 The total in-stream area directly affected, 4 The volume of gravel or sediment removed (if applicable), 5 The frequency of monitoring including who the QP or EM was, 6 The turbidity reporting and accompanying data along with a description of any levels higher than the authorization and what immediate steps were taken (if applicable), 7 Representative site photographs; 8 Whether or not they observed or were otherwise aware of any non-compliance with the terms and conditions of this Approval; and 9 A description of any environmental incidents, non-compliance or other difficulties, and how these were addressed and reported.		
aa	The holder of this Approval must retain an appropriately Qualified Professional to design, implement and report on the effectiveness of mitigation, restoration, and/or offsetting measures required in this Approval. The effectiveness monitoring term required for this approval is 10 years following the completion of construction of the offsetting habitat. Monitoring for riparian, instream, and wetland habitat should occur for 5 years, over a 10-year period following the completion of construction of the habitat offsetting unless a Qualified Professional deems the site functional prior to the end of the 5 years of monitoring. Monitoring must occur until the habitat is deemed functional at like for like or like for greater than the original habitat by a Qualified Professional. Effectiveness Monitoring reports shall be submitted no later than December 1 of each calendar year for the duration of monitoring. The reports shall be submitted via email to SouthCoastWSAREporting@gov.bc.ca, with the approval file number listed in the report and the subject line of the email. The reports shall include		
ab	1 Documentation (including photographs) and summary of the survival of planted trees and shrubs. Tree survival rates must be 100%. Shrub and other plant survival rates must exceed 80%. Replanting may be required to achieve this success rate. If the area is susceptible to invasive species, the riparian planting plan should be modified to include a denser plant spacing as well as additional monitoring and maintenance to ensure an adequate plant survival rate of 80% can be achieved. It is recommended that trees and shrubs be protected from beavers and voles with metal fencing and vole guards, respectively. 2 Observation and documentation (including photographs) related to flows and function of the restored or new channel and its features. 3 Fish presence, species composition, and if fish stranding is occurring within the newly constructed channel. 4 Amphibian species presence by egg mass surveys, 5 Recommendations for adaptive management, such as additional channel complexing or modifications if required, to address habitat limitations such as insufficient flows, fish stranding, etc., 6 Monitoring, maintenance and implementation of the above recommendations if required. 7 Water quality monitoring including temperature, pH, Dissolved Oxygen, and turbidity.		
ac	To address the permanent instream and riparian impacts associated with the project, the holder of this Approval must		
ad	1 Retain one or more appropriately qualified professionals to develop an offsetting plan that includes		
ae	i The creation of a minimum of 1,310 m2 of instream, 2,274 m2 of wetland, and 743 m2 riparian habitat that is like for like, or like for better habitat, in terms of structure, functionality (e.g., flow regime), and target species. If the actual instream, wetland, and/or riparian impact area is larger than estimated in "Environmental Enhancement Management Plan Hwy 91/17 Upgrade Project, Delta, BC. Submitted to Pacific Gateway Constructors prepared by Brybil Projects Ltd. Dated June, 2020" the compensation works must offset the actual area lost using the above stated like for like or like for better guidelines. ii A post-construction monitoring plan of the compensation works over 10 years following the completion of the offsetting measures. iii A commitment to prepare and submit annual post-construction monitoring reports at the end of every year of the monitoring program. A final monitoring report must be submitted upon completion of the annual monitoring program or upon reaching the survivorship and/or functionality requirements if these were not met during the monitoring program. 2 Develop the offsetting plan in collaboration with interested First Nations, local governments, and the Ministry of Forests, Lands, and Natural Resource Operations and Rural Development. Submit an amendment to this approval, or a new Change Approval or a Water License, whichever is applicable to the offsetting proposal, to authorize the construction of the offsetting works. This application must be submitted to Front Counter BC and the tracking number must be provided to WaterActReferrals.LowerMainland@gov.bc.ca no later than December 31, 2020, unless otherwise specified in writing by the Water Manager.		
af	h) Effectiveness monitoring must take place during the same time of year each year to provide comparable data. Monitoring of plant survival in riparian and wetland areas and of instream areas should be scheduled during the summer, during a period between high and low water (likely July). Results of initial monitoring will determine how much further monitoring may be required until enhancement habitats are self-sustaining. Targets include 1 Plant survival is ≥ 80%; Tree survival rate of 100 % 2 Native plant cover is two thirds greater than invasive species cover within 5 years; 3 Visual survey of LWD and boulders to confirm they are in place and intact, and that boulders are effectively creating riffles and pools and creating cover for fish and habitat for amphibians; and 4 Fish are present in instream areas and there are no new barriers to movement		

WSA Approval 2007755
Change Approval - Changes in and About SFPR Offset site FC239, and drainage between SFPR Offset site FC239 and Silda Ditch (Site H)

Legend
Difference between Approval 2007795 & 2007755
Difference between Approval 2007783 & 2007755
Difference between Approval 2007749 & 2007755
Difference between Approval 2007770 & 2007755

Conditions	Responsibility
If land clearing is to occur within the breeding bird period (March 30 to August 16 in Zone A1, which includes the Lower Mainland and Fraser Valley), a nest survey must be conducted and a 10m no-clearing buffer placed around the nest until the nest is determined to be no longer active.	
d The work(s) authorized in this Approval shall be completed on or before Dec. 31, 2023.	
e All works associated with an Environmental Enhancement Management Plan, as outlined in clause (m) and requirements in clause (ii) below shall be completed on or before December 31, 2033 (based on 10 years).	
f Work in the stream and stream channel shall occur only during the periods outlined below, so that the fisheries interests are protected	
1 Instream work during the reduced risk instream work window shall occur during the period of August 1 to September 30; or	
2 Based on project justification and risk, instream work outside of the reduced risk instream work window (as stated above), subject to the following	
i An appropriately qualified professional shall provide advice to the holder of this Approval on the timing of the work based on the nature of the works, environmental values (including fish, amphibians, wildlife, any listed species present), water quality, channel stability, weather conditions, water levels, and any other relevant factors; and	
ii The Qualified Professional shall also provide additional construction mitigation advice to the holder of this Approval, and daily or full-time supervision of all work in or near the stream; and	
iii Work must be timed and planned appropriately, the stream must be completely dry or have marginal flows for the duration of the construction activities; and	
iv The advice of the Qualified Professional on construction timing (as per (i) above) and mitigation measures (as per (ii) above), as well as the timing of work and the presence of the Qualified Professional, must be documented in writing. This documentation must be submitted as part of the post construction reporting for this project.	
g All machinery and equipment operating within the stream shall be clean, free of external grease, oil or fluid leaks and shall use biodegradable grease, oil and fluids.	
h Fuelling and servicing of vehicles and equipment must occur a minimum of 30 metres away from all streams, lakes and waterbodies. Keep a spill containment kit on site and train onsite staff in its use. Immediately report any spill of a substance that is toxic, polluting, or deleterious to aquatic life of reportable quantities to the Dangerous Goods Incident Report 24-hour phone line at 1-800-663-3456.	
i The works shall not result in depressions that have the ability to trap fish and other aquatic life.	
j The holder of this approval shall take reasonable care to avoid damaging any land, works, trees, or other property and shall make full compensation to the owners for any damage or loss resulting from the exercise of the rights granted with this approval.	
k Riparian areas which are disturbed by the works shall be restored to their original condition and protected from erosion.	
l All material utilized during construction shall be contained and placed in a stable area such that it is not able to mobilize and managed to avoid entry into any stream or watercourse.	
m All works shall be completed in accordance with	
1 ENG DWG Site H Key Plan/Drawing Index, by McElhanney, 2020-02-20	
2 ENG DWG Site H Plan, by McElhanney, 2020-02-20	
3 ENG DWG Site H Profile, by McElhanney, 2020-02-20	
4 ENG DWG Site H Typical Sections, by McElhanney, 2020-02-20	
5 ENG DWG Site H Culvert Plan and Profiles, by McElhanney, 2020-02-20	
6 Report Section 11 Approval Application Highway 91/17 Upgrades, Section 1 And 2, By Brybil Projects Ltd., February 21, 2020	
7 Stormwater Management Plan, McElhanney May 6, 2020	
8 CEMP, 3rd Revision, May 2020	
9 Surface Water Quality & Sediment Control Plan (of CEMP)	
10 Fisheries Habitat Mitigation and Compensation Plan (of CEMP)	
11 Environmental Enhancement Management Plan (EEMP), Brybil Projects Ltd., June 2020	
12 Memo Additional FLNRO Information, Dave Hayward, Brybil, June 8, 2020; and	
13 Any other documents related to the File No. 2007755.	
The holder of this approval must adhere to the standards of professional accountability, as signed off by Qualified Professional(s), Dave Hayward and Rob Hoogendorn on June 2, 2020, regarding the Key Aquatic	
n Habitat Questions for Qualified Professionals specific to Bank Erosion Protection and Stream Diversion/in-filling, on behalf of the holder of this approval. It is the responsibility of the holder of this Approval to retain an appropriately qualified professional(s) for the relevant duration of works in order to uphold this signed professional assessment.	
o All work shall be carried out in accordance with the Provincial "Standards and Best Practices for In-stream Works" (2004). The Provincial guidance document can be found at the following link http://www.env.gov.bc.ca/wld/documents/bmp/iswstdsbpsmarch2004.pdf .	
p The holder of this Approval must hire an appropriately Qualified Professional to conduct Environmental Monitoring on all in-stream works authorized under this Approval. The Qualified Professional must be an applied scientist or technologist, acting alone or together with another qualified professional. He or she must be registered and in good standing in British Columbia with an appropriate professional organization constituted under an Act, acting under that association's code of ethics and subject to disciplinary action by that association. The Qualified Professional is responsible for observing the methods of construction and preparing information and reports on the compliance of the construction activities. The Qualified Professional shall	
1 Ensure all best management practices and mitigation measures are in place to avoid and minimize environmental impact on the land and on fish and fish habitat of the stream.	
2 Where applicable, assist in the isolation of the stream prior to the commencement of works.	
3 Implement and ensure erosion and sediment control measures are constructed, installed, and maintained appropriately for the full duration of instream works.	
4 Supervise all instream works authorized under this Approval.	
5 When the works involve temporary diversions to isolate the work site,	
i Monitor all diversion works daily to ensure pumps & flow bypasses are in proper working condition;	
ii Ensure diversion works that include pump intakes be screened for fish and aquatic species in accordance with the "Interim code of practice End-of-pipe fish protection screens for small water intakes in freshwater" (Fisheries and Oceans Canada, 2020); and	
iii Ensure fish are prevented from entering the works.	
6 When the works involve dewatering or isolation of flow and the stream is known or suspected to contain fish and/or amphibians,	
i Attend the site prior to conducting any instream works to complete fish and wildlife search and salvages;	
ii Obtain any permits needed prior to undertaking the salvage(s); and	
iii Inspect the extraction area for fish stranding at least once after water levels have declined.	
7 In the event of an environmental incident or non-compliance with any of the terms or conditions of this Approval, notify the Water Manager (SouthCoastWSAReporting@gov.bc.ca), within 24 hours.	
8 Be granted authority to stop the work authorized under this Approval if deemed necessary to address risks to the environment. The Qualified Professional or their designate (specified in writing) must be on site during all phases of construction in and around the stream to ensure this component is upheld.	
q Upon commencement of the project, the work shall be pursued to completion as quickly as possible.	
r All equipment and machinery used in or near the stream channel	
1 Must be in good operating condition and free of leaks, excess oil and grease;	
2 Must have a spill containment kit readily accessible on-site;	



3	May not be refuelled within 30 meters of any watercourse; and	
4	Must use environmentally sensitive hydraulic fluids which are non-toxic to aquatic life and which are readily or inherently bio-degradable.	
5	Sediment and Erosion Control measures to prevent the release of silt, sediment or sediment-laden water must be in place before starting works that may result in sediment mobilization. Care shall be exercised during all phases of the work to prevent the release of silt, sediment, sediment-laden water, raw concrete, concrete leachate or any deleterious substances. All control measures must meet or surpass the Provincial "Standards and Best Practices for In-stream Works" (2004) and the "Land Development Guidelines for the Protection of Aquatic Habitat" (Fisheries and Oceans Canada and the British Columbia, 1993).	
t	Sediment removal boundaries must be clearly delineated prior to commencement of work. All sediment excavation for removal purposes shall be completed in isolation of the stream flows.	
u	Discharge and runoff water from the site into any watercourse(s) must comply with the BC Approved Water Quality Guidelines for the Protection of Aquatic Life (https://www2.gov.bc.ca/gov/content/environment/air-land-water/water/water-quality/water-quality-guidelines/approved-water-quality-guidelines and https://www2.gov.bc.ca/assets/gov/environment/air-land-water/water/waterquality/wqgs-wqos/approved-wqgs/turbidity-or.pdf) and/or the applicable Local Government Bylaw(s).	
v	be taken upstream of any works taking place and within the extent of the sedimentation downstream of where instream work is actively occurring. Measurements should be taken immediately prior to works beginning, and then at regular intervals until the works are completed and may require additional frequency during wet weather conditions. Wet weather conditions will be defined as being equal to or greater than 25 millimetres of rainfall within a 24 hour period.	
w	All excavated material and debris shall be removed from the site or placed in a stable area above the high water mark of the stream. Mitigative measures must be applied to protect the excavated material and debris from erosion and reintroduction into the watercourse. These measures may include covering the material with erosion blankets, seeding and planting with native vegetation, or as otherwise directed by a Qualified Professional.	
x	All material utilized during construction shall be contoured and placed in a stable area such that it is not able to mobilize and managed to avoid entry into any stream or watercourse.	
y	Site preparation and construction of the works is to be carried out from the banks of the stream, thus minimizing disturbance to the stream.	
z	The holder of this Approval shall ensure that instream works are designed and installed so as not to restrict fish passage and/or lead to fish stranding.	
aa	All temporary works (including a ford, stream crossing and flow bypass) shall be removed on completion of the project, and the stream channel restored to its natural condition.	
ab	Vegetation along the banks of the stream shall be disturbed as little as possible. All disturbed areas must be restored using native vegetation that is suitable for the site conditions.	
bb	The new channel of the stream must have greater or equal hydraulic capacity than the existing channel.	
cc	The hydraulic capacity of installed culvert(s) must be equivalent to the hydraulic capacity of the stream channel or be capable of passing the 1 in 200 year maximum daily flow without the water level at the culvert(s) inlet exceeding the top of the culvert(s).	
dd	Rock used as riprap shall be clean of any substances deleterious to aquatic life and shall be durable, angular in shape and suitably graded and sized to resist movement by stream flow. Any other engineering material required for the construction of the works shall be clean of any substances deleterious to aquatic life.	
ee	All rock used in the works shall be clean and free of sediment producing material, durable, non-acid generating and suitably graded.	
ff	Treated wood products shall not be used in any construction below the high-water mark of the stream channel.	
gg	Large woody debris and the stubs of large diameter trees must be left in place or retained on-site where it is safe to do so.	
hh	Care shall be exercised during pile driving to minimize potential adverse impacts to fish or wildlife. The following mitigation measures shall be implemented	
1	Where possible and feasible, piles should be installed using a vibratory hammer.	
2	Piles installed using an impact hammer must implement mitigation measures to reduce water pressure sound waves in excess of 30 kilopascals (kPa).	
3	Mitigation measures such as bubble curtains, double wall piles, or isolation methods shall be implemented to avoid adverse impacts to fish.	
4	Where water pressure sound waves may exceed 30 kPa, isolation methods must be implemented to prevent fish and wildlife from entering the work area.	
5	Monitoring underwater sound wave levels must be conducted continuously and within 10 meters of the pile being driven to ensure levels do not exceed 30 kPa. The construction with timber piles does not require underwater sound monitoring.	
6	In the event that distressed, injured or dead fish are observed following the initiation of pile driving, work shall halt immediately and the holder of this Approval or appropriate designate must contact the Water Manager as soon as practicable for additional requirements before work is resumed.	
ii	The holder of this Approval must provide a detailed post-construction report no later than December 1 of the year works were completed. The report must be labelled with this Approval file number and labelled in the subject line of the email and submitted to SouthCoastWSAReporting@gov.bc.ca. That report shall include a signed statement from an appropriately Qualified Professional summarizing	
1	The in-stream works undertaken,	
2	The timing of those works,	
3	The total in-stream area directly affected,	
4	The volume of gravel or sediment removed (if applicable),	
5	The frequency of monitoring including who the QP or EM was;	
6	The turbidity reporting and accompanying data along with a description of any levels higher than the authorization and what immediate steps were taken (if applicable),	
7	Representative site photographs;	
8	Whether or not they observed or were otherwise aware of any non-compliance with the terms and conditions of this Approval; and	
9	A description of any environmental incidents, non-compliance or other difficulties, and how these were addressed and reported.	
jj	The holder of this Approval must retain an appropriately Qualified Professional to design, implement and report on the effectiveness of mitigation, restoration, and/or offsetting measures required in this Approval. The effectiveness monitoring term required for this approval is 10 years following the completion of construction of the offsetting habitat. Monitoring for riparian, instream, and wetland habitat should occur for 5 years, over a 10-year period following the completion of construction of the habitat offsetting unless a Qualified Professional deems the site functional prior to the end of the 5 years of monitoring. Monitoring must occur until the habitat is deemed functional at like for like or like for greater than the original habitat by a Qualified Professional. Effectiveness Monitoring Reports shall be submitted no later than December 1 of each calendar year for the duration of monitoring. The reports shall be submitted via email to SouthCoastWSAReporting@gov.bc.ca, with the approval file number listed in the report and the subject line of the email. The reports shall include	
1	Documentation (including photographs) and summary of the survival of planted trees and shrubs. Tree survival rates must be 100%. Shrub and other plant survival rates must exceed 80%. Replanting may be required to achieve this success rate. If the area is susceptible to invasive species, the riparian planting plan should be modified to include a denser plant spacing as well as additional monitoring and maintenance to ensure an adequate plant survival rate of 80% can be achieved. It is recommended that trees and shrubs be protected from beavers and voles with metal fencing and vole guards, respectively.	
2	Observation and documentation (including photographs) related to flows and function of the restored or new channel and its features.	
3	Fish presence, species composition, and if fish stranding is occurring within the newly constructed channel.	
4	Amphibian species presence by egg mass surveys,	
5	Recommendations for adaptive management, such as additional channel complexing or modifications if required, to address habitat limitations such as insufficient flows, fish stranding, etc.,	
6	Monitoring, maintenance and implementation of the above recommendations if required.	
7	Water quality monitoring including temperature, pH, Dissolved Oxygen, and turbidity.	
kk	To address the permanent instream and riparian impacts associated with the project, the holder of this Approval must	
1	Retain one or more appropriately qualified professionals to develop an offsetting plan that includes	
i	The creation of a minimum of 406 m ² of instream, 702 m ² of wetland, and 5,495 m ² riparian habitat that is like for like, or like for better habitat, in terms of structure, functionality (e.g., flow regime), and target species. If the actual instream, wetland, and/or riparian impact area is larger than estimated in "Environmental Enhancement Management Plan Hwy 91/17 Upgrade Project, Delta, BC. Submitted to Pacific Gateway Constructors prepared by Brybil Projects Ltd. Dated June, 2020" the compensation works must offset the actual area lost using the above stated like for like or like for better guidelines.	



<p>A post-construction monitoring plan of the compensation works over 10 years following the completion of the offsetting measures. Monitoring must take place during the same time of year each year to provide comparable data. Monitoring of plant survival in riparian and wetland areas and of instream areas should be scheduled during the summer, during a period between high and low water (likely July). Results of initial monitoring will determine how much further monitoring may be required until enhancement habitats are self-sustaining.</p> <p>A commitment to prepare and submit annual post-construction monitoring reports at the end of every year of the monitoring program. A final monitoring report must be submitted upon completion of the annual monitoring program or upon reaching the survivorship and/or functionality requirements if these were not met during the monitoring program.</p> <p>2 Develop the offsetting plan in collaboration with interested First Nations, local governments, and the Ministry of Forests, Lands, and Natural Resource Operations and Rural Development.</p> <p>3 Submit an amendment to this approval, or a new Change Approval or a Water License, whichever is applicable to the offsetting proposal, to authorize the construction of the offsetting works. This application must be submitted to Front Counter BC and the tracking number must be provided to WaterActReferrals.LowerMainland@gov.bc.ca no later than December 31, 2020, unless otherwise specified in writing by the Water Manager.</p>	
<p>II Effectiveness monitoring must take place during the same time of year each year to provide comparable data.</p> <p>Monitoring of plant survival in riparian and wetland areas and of instream areas should be scheduled during the summer, during a period between high and low water (likely July). Targets include</p> <p>1 Plant survival is $\geq 80\%$; Tree survival rate of 100 %.</p> <p>2 Native plant cover is two thirds greater than invasive species cover within 5 years;</p> <p>3 Visual survey of LWD and boulders to confirm they are in place and intact, and that boulders are effectively creating riffles and pools, creating cover for fish and habitat for amphibians; and</p> <p>4 Fish are present in instream areas and there are no new barriers to movement</p>	

APPENDIX 6: STATUS OF TOCA COMMITMENTS TABLE

Ref	Objective Commitments & Assurances	Timing	Delivered By	Status Update	
				Ongoing	Complete
1.0 Responsible Environmental Management					
1.1	Develop, implement, and maintain an Environmental Management Plan (EMP) for the Project to demonstrate how the design, construction and operation, including maintenance, of the Project: - Will be carried out to avoid or mitigate negative impacts; - Will be carried out in an environmentally responsible manner, in accordance with DBSS 165 [Protection of the Environment]; - Will employ Best Management Practices (BMPs3); and - Will comply with federal and provincial legislation, permits, approvals and authorizations, including the Environmental Assessment Certificate (EAC).	All phases	Contractor	X	
1.2	Prepare and implement a Construction Environmental Management Plan (CEMP), (which is a component of the EMP), including relevant sub-plans, for the Project prior to the start of relevant construction activities.	Pre-construction	Contractor	X	
1.3	Obtain required statutory permits, approvals, and authorizations before proceeding with construction that requires such permits.	All phases	Contractor	X	
1.4	Adhere to the terms and conditions of the: EAC; federal screening report; the EMP; DBSS 165 [Protection of the Environment]; and any other applicable permits, licenses and approvals.	Pre-construction, construction	Contractor	X	
1.5	Establish an Inter-Agency Environmental Review Committee (IAERC), in accordance with the Terms of Reference developed during Application review, to provide for agency review and comment on plans and designs prior to construction, including but not limited to: - Detailed design of stormwater management infrastructure;	Pre-construction, construction	MOTI / Contractor	N/A	

	- Detailed vegetation and wildlife mitigation plans and mitigation monitoring plans; and - Environmental management plans.				
1.6	Provide all project related EMPs, including component EMPs, to applicable regulatory agencies in the IAERC for review and comment, at least 30 calendar days prior to the start of construction that requires such plans.	Pre-construction	Contractor	N/A	
1.7	Relevant sub-plans to be included in the CEMP will include those to address environmental issues identified in the Application and supporting documentation submitted to the EAO during the Application review, and described in the Application (Section 11, pg. 523), including but not limited to: - Agriculture Mitigation Plan; - Air Quality and Dust Control Plan; - Archaeological Mitigation / Monitoring Plan; - Construction and Hazardous Waste Management Plan; - Contaminated Sites Management Plan; - Contractor Awareness and Education Plan; - Environmental Monitoring Plan; - Fisheries Habitat Mitigation and Compensation Plan; - Health and Safety Plan; - Invasive Species Management Plan; - Noise and Vibration Management Plan; - Spill Management and Emergency Response Plan; - Surface Water Quality and Sediment Control Plan; - Wildlife and Habitat Management Plan.	Pre-construction	Contractor	X	
1.8	Manage contamination encountered during project development, regardless of the current assessment of potential contamination, in accordance with applicable regulatory requirements.	All phases	Contractor	X	
1.9	Prepare and implement an Operational Environmental Management Plan, prior to operation and maintenance activities. Provide the operational EMP to relevant reviewing and regulatory agencies, for review and comment, at least 30 calendar days prior to the onset of operation and maintenance activities.	Pre-construction	Contractor	TBD	
1.10	At a minimum, review the Wildlife and Habitat Management Plan and modify if required, three years post- construction and make a decision regarding the next review date and/or determine the closure date for the plan(s). The method for review, modification, and decision on closure of the plan(s) will be defined by the applicable regulatory agencies within the IAERC	Operations	Contractor	N/A	
2.0 Monitoring					
2.1	Ensure that environmental monitoring and reporting for the Project will be conducted, with respect to the terms and conditions of the EAC and other regulatory permits, approvals and authorizations as applicable.	Construction	Contractor	X	
2.2	Incorporate a monitoring component into all applicable sub-plans of the construction EMP developed for the construction phase of the Project.	Pre-construction	Contractor	X	
2.3	Outline in each of the sub-plans of the construction EMP: - Rationale for monitoring; - Parameters to be monitored;	Pre-construction	Contractor	X	

	- Monitoring program details; and - Required follow-up actions.				
2.4	The Owner will engage an Environmental Monitor for the construction phases of the Project to undertake environmental monitoring activities and oversee implementation of each of component plans of the EMP developed for the Project. The Environmental Monitor will monitor, evaluate, and report to the owner on construction activities and the effectiveness of the environmental management strategies and mitigation measures, with respect to the terms and conditions of the Application and other regulatory Permits, Approvals and Authorizations that may apply. The Monitor will be responsible for making onsite decisions and taking on-site action to avoid/respond to potential environmental effects which could include temporary stop work orders if necessary.	Construction	Contractor	X	
2.5	Implement environmental quality management program through monitoring, auditing and reporting activities for the Project with respect to the terms and conditions of the EAC and other regulatory permits, approvals and authorizations.	All phases	Contractor	X	
3.0 Incident Management					
3.1	Respond to environmental incidents, including spill incidents in accordance with the Emergency Response Plan to minimize effects and risks to the general public, on-site workers and the environment.	All phases	Contractor	X	
3.2	Include protocols, consistent with the BC Spill Reporting Regulation, for reporting spills to appropriate emergency response authorities, including; - The Provincial Emergency Program, in the case of any spills of reportable deleterious substances into waters frequented by fish, regardless of the amount of the spill; and - To adjacent property owners and occupiers, including local government, where utilities cross the highway and there is a potential for an incident to extend beyond the Project boundaries.	Pre-construction	Contractor	X	
3.3	Train all field Project personnel regarding implementation of the Construction and Hazardous Waste Management and Spill Management and Emergency Response Plans.	All phases	Contractor	X	
3.4	Incorporate relevant municipal contacts into the emergency contacts for the Construction and Hazardous Waste Management and Spill Management and Emergency Response Plans prepared for construction of the Project.	Pre-construction	Contractor	X	
3.5	Follow applicable DBSS 165 and Canadian Council of Ministers of Environment codes and procedures if temporary fuel storage/fueling facilities are required during construction. Where there is a difference in standards, the most stringent measure for environmental protection will take precedence.	Construction	Contractor	X	
4.0 Community Consultation					
4.1	Consult with local governments, stakeholders and the public during all stages of Project development.	Pre-construction; construction	MoT, Contractor	X	
4.2	Conduct community open houses and information sessions during the design review stage to obtain input on design refinements, during the preliminary and final design review stages.	Pre-construction	MoT, Contractor	N/A	
4.3	Provide regular public information updates on the progress of construction, the schedule, and upcoming milestones.	Construction	MoT, Contractor	X	

4.4	Consult with the Corporation of Delta (CoD) and the City of Surrey (CoS) during all stages of project development and construction.	Pre-construction; construction	Contractor	X	
4.5	Provide updated media information materials, as part of the Project commitment to making project information available to the public.	All phases	Contractor	X	
4.6	Track project enquiries and responses.	All phases	Contractor	X	
4.7	Discuss potential economic opportunities generated by the Project with participating First Nations throughout the Post-EA Certification, Design and Construction Phases of the Project.	Pre-construction; construction	MoT, Contractor	X	
4.8	Obtain input from participating First Nations to identify appropriate measures to mitigate potential project related impacts on their previously identified interests in relation to fisheries and habitat matters.	Pre-construction	Contractor	X	
5.0 Stormwater Management					
5.1	Ensure that the design, construction and maintenance of stormwater management infrastructure for the Project takes an integrated approach to stormwater management and contributes to maintaining, or improving, drainage and water quality conditions directly adjacent to the corridor.	All phases	Contractor	TBD	
5.2	Design, construct and maintain stormwater management infrastructure, such that it to meets the performance objectives outlined in the Stormwater Management Plan Outline (July, 2007) and the Application. Monitoring of the infrastructure will be undertaken to confirm performance objectives are met or, if necessary, additional steps are taken to ensure performance objectives are achieved.	All phases	Contractor	X	
5.3	Consult with municipalities adjacent to the new construction area such that the approach to the management of stormwater and drainage design is complementary to, and can be integrated with, adjacent municipal stormwater infrastructure.	Pre-construction	Contractor	TBD	
5.4	Provide final designs for stormwater management infrastructure to relevant First Nations and reviewing and regulatory agencies for review and comment at least 30 calendar days prior to relevant construction activities in order to verify that the proposed infrastructure achieves agreed upon performance measures identified in the Stormwater Management Plan Outline (July 2007).	Pre-construction	Contractor	TBD	
5.5	Drain stormwater and road runoff away from red and blue listed plant communities and do not construct integrated stormwater management infrastructure in such habitat areas.	Construction; operation	Contractor	TBD	
5.6	Obtain input from participating First Nations regarding mitigation measures outlined in the stormwater and drainage plan and effective integration of those measures into the design and operation of the Project.	Pre-construction	Contractor	TBD	
6.0 Agriculture					
6.1	Consult with the Agricultural Land Commission (ALC), Ministry of Agriculture and Lands (MAL), Delta Farmers' Institute (DFI), individual farm owners and the CoD, through all future stages of Project development, construction and operation, to ensure impacts to agricultural lands and operations are minimized where possible and appropriately addressed where impacts are unavoidable.	All phases	MoT, Contractor	X	
6.2	Obtain ALC approvals regarding areas within the Agricultural Land Reserve (ALR) required for the project, prior to construction.	Pre-construction	MoT, Contractor		X

6.3	Develop and implement an Agricultural Mitigation Plan as outlined in the Application that identifies potential impacts to agriculture as a result of project construction activities and measures for avoiding and addressing such impacts where possible. The scope will include those measures outlined in the Application and the Agricultural Enhancement Strategy (April 2008), including but not limited to mitigation measures focused on: - Road access; - Drainage and irrigation; - Utilities; and - Maintaining the agricultural land base.	Pre-construction	Contractor	X	
6.4	Finalize and implement specific agricultural enhancement initiatives, including but not limited to, compensation mechanisms focused on improving road access and drainage and irrigation, as part of the application process to the ALC and summarily as part of the Agricultural Enhancement Strategy (April 2008).	Pre-construction; construction	MoT	X	
6.5	Retain the services of a Professional Agrologist to: - Liaise with the owner, Design-Builder and farmer(s); - Oversee a consultation and dispute resolution process for individual farmers affected by the Project; and - Oversee monitoring and effectiveness of measures proposed to address impacts to agriculture during design, construction and operation.	All phases	MoT	X	
6.6	Avoid, to the extent possible, using agricultural lands outside of the Right-Of-Way (ROW), for staging areas. For all agricultural lands that are required for use as staging areas, implement construction BMPs (as noted in the Agriculture Mitigation Plan in the EMP) to manage potential construction related effects and restore lands to pre-construction condition, or better agricultural capability, upon completion of project works.	Pre-construction; construction	Contractor	X	
6.7	Consult with individual farm owners, as well as MAL, ALC, CoD, DFI and other stakeholders, to identify potential impacts to agricultural operations and infrastructure and ensure that such impacts are avoided, mitigated for, or appropriately addressed during future stages of design and construction of the Project. The scope of potential impacts to farm operations includes, but is not limited to: - Agricultural drainage; - Utilities; - Road Access; and - Pollinators.	Pre-construction; construction	MoT; contractor	X	
6.8	Undertake reasonable measures to facilitate the consolidation of parcels of isolated agricultural lands, to promote continued agricultural use of such lands.	All phases	MoT	X	
6.9	Undertake reasonable measure to minimize potential loss of ALR lands, including existing farm(s) by: - Refining the Project footprint where feasible; and - Optimizing use of existing ROW.	Pre-construction; construction	Contractor	X	
7.0 Air Quality					
7.1	Ensure that the construction works and operations for the Project are conducted in compliance with environmental permits and approvals and that all reasonable measures are taken to address project-related effects on air quality.	Construction, operation	Contractor	X	

7.2	Develop and implement an Air Quality and Dust Control Plan for the construction phase of the project. The plan will: - Include an air quality monitoring program with thresholds, which if exceeded, will trigger the implementation of additional mitigation and corrective measures; - Commit to the best available, known and effective, measures for mitigating construction related air emissions, including diesel particulate matter (PM), as identified by relevant regulatory agencies. This would include, where practical, the use of diesel oxidation catalysts (DOCs) or diesel particulate filters (DPFs) on all on-road and off-road project equipment in combination with use of a B20 biodiesel blend; - Include an anti-idling policy for construction equipment and other vehicles associated with construction related activities; - Commit to fugitive dust minimization strategies (e.g. wheel wash and sweeping), and dust suppression techniques (e.g. watering) on roads; and - Identify site specific considerations, where applicable, such as proximity to sensitive environmental or human receptors.	Pre-construction; construction	Contractor	X	
7.3	Provide the Air Quality and Dust Control Plan to Metro Vancouver, Environment Canada (EC), Ministry of Environment (MoE), Transport Canada, Health Canada (HC) and other relevant agencies for review and comment at least 30 calendar days prior to relevant construction activities.	Pre-construction	MoT, Contractor	X	
7.4	Avoid burning as a means for disposing of land clearing debris.	Construction	Contractor	X	
8.0 Traffic Management					
8.1	Ensure that the design of the Project is integrated with local road networks, and that construction of the proposed project includes measures for avoiding or minimizing impacts to local road networks.	Pre-construction; construction	MoT, Contractor	X	
8.2	Prepare and implement a Traffic Management Plan in coordination with CoS and CoD to address construction related traffic conditions.	Pre-construction; construction	Contractor	X	
8.3	Consult with the CoD, CoS, MoT district office, and other stakeholders to design and construct project infrastructure so that it is effectively integrated with existing and planned local road networks.	Pre-construction; construction	Contractor	X	
9.0 Noise and Vibration					
9.1	Ensure that potential noise impacts associated with the project are considered and mitigation provided for during design, construction and operation of the project.	All phases	Contractor	X	
9.2	Prepare and implement a Noise and Vibration Management Plan for the construction phase of the Project that will include specific mitigation measures, and locations where they will be applied to address construction related noise.	Pre-construction; construction	Contractor	X	
9.3	Prepare a noise complaint protocol as part of the CEMP Noise and Vibration Management Plan to respond in a timely manner to concerns and complaints raised by residents and take reasonable actions to reduce the Project-related construction noise in question.	Pre-construction	Contractor	X	
9.4	Provide the construction Noise and Vibration Management Plan to the CoS, CoD and other stakeholders for review and comment 30 calendar days prior to the onset of relevant construction activities.	Pre-construction	Contractor	X	

9.5	Design and construct mitigation measures to address potential operational noise impacts on residential areas as part of the project according to the MoT Noise Policy (1993) [referenced as the Noise Policy in this Agreement].	Pre-construction; construction	Contractor	TBD	
9.6	Conduct noise monitoring at the baseline sites during the first year after construction is complete to assess the effectiveness of mitigation measures, with a commitment to further mitigation if necessary, technically feasible and practical.	Operation	Contractor	TBD	
9.7	Consult with the CoD and CoS to look for opportunities to use tree planting and landscaping to mitigate potential visual, noise and air quality impacts.	Pre-construction; construction	Contractor		
9.8	Participate in meetings with affected communities and residents to address site-specific noise issues in the event that late evening or night time construction works prove necessary in the vicinity of residential areas.	Pre-construction; construction	Contractor	TBD	
9.10	Perform pre-condition surveys to document existing state of buildings and facilities in the vicinity of SFPR construction activities as per standard geotechnical BMPs. This will form the baseline conditions, against which post-construction condition surveys will be carried out to assess any vibration impacts to buildings and facilities as a result of Project construction.	Pre-construction	Contractor	X	
9.11	Monitor ground vibrations, as per standard geotechnical BMPs, adjacent to buildings to confirm that vibration levels are within ranges expected to avoid construction-related vibration.	Construction	Contractor	X	
10.0 Contaminated Sites and Property Acquisition					
10.1	Ensure that potential site contamination is investigated, and managed in compliance with the Contaminated Sites Regulation (Environmental Management Act), during all stages of project development including property acquisition, design and construction.	All phases	Contractor	X	
10.2	Assess all Tier 1 and Tier 2 properties required for the ROW for potential contamination prior to construction and take steps, as required, to investigate and address site contamination that may exist.	Pre-construction; construction	MoT; Contractor	X	
10.3	Manage any contaminated groundwater encountered in accordance with the requirements of the Environmental Management Act and associated regulations.	Pre-construction; construction	MoT; Contractor	X	
10.4	Undertake risk assessment and remediation activities, as required, and manage potential contamination in compliance with the provincial Environmental Management Act and Contaminated Sites Regulation.	Pre-construction; construction	MoT; Contractor	X	
10.5	Should contaminated groundwater be identified along the route, include measures to control/mitigate the potential for impacts to surface water in future stormwater design.	All phases	MoT; Contractor	X	
10.6	Notify MoE of potential migration of contaminants from known or identified Tier 1 off-corridor properties of concern discovered during supplementary investigations or Project-related activities and use information to manage and mitigate contaminated sites issues prior to construction.	Pre-construction	Contractor	X	
10.7	As part of the CEMP, the Contaminated Sites Management, Construction and Hazardous Waste Management and Spill Management and Emergency Response Plans, develop and implement a protocol for identifying and managing contaminated and potentially contaminated materials during the construction phase of the Project.	Pre-construction; construction	Contractor	X	
11.0 Fisheries					

11.1	Ensure that all works and activities associated with the construction, operation and maintenance of the project are conducted in compliance with the Fisheries Act. This includes implementing mitigation measures and best management practices to ensure that the project does not cause any unauthorized harmful alteration, disruption or destruction of fish habitat, that the project does not cause any harm or mortality to fish, and that the project does not cause or result in the deposit of a deleterious substance of any type, including sediment, into a watercourse that is frequented by fish.	All phases	Contractor	X	
11.2	Obtain an authorization under subsection 35(2) of the Fisheries Act for any unavoidable harmful alteration, disruption or destruction of fish habitat prior to relevant construction works or activities.	All phases	Contractor	X	
11.3	Develop and construct fish habitat compensation measures that offset all project impacts to fish habitat. These fish habitat compensation measures will be constructed by the proponent as directed by Fisheries and Oceans Canada and in accordance with any s. 35(2) Fisheries Act authorizations.	Pre-construction; construction	Contractor	X	
11.4	Implement appropriate measures to adequately mitigate the effects of the creation of impervious surfaces on volume of surface runoff, rate of runoff, and water quality. These will meet performance targets established in the Stormwater Management Plan Outline (July, 2007) for the project.	Pre-construction; construction; operation	Contractor	TBD	
11.5	Establish and maintain riparian setback areas from drainage channels and watercourses in accordance with regulatory requirements.	Pre-construction; construction; operation	Contractor	X	
11.6	Take all reasonable measures to prevent substances that may be harmful to fish from entering the aquatic environment at the construction sites in the proximity to fish and aquatic habitat, paying particular attention to discharges of suspended sediments, construction waste, handling of uncured concrete and other deleterious substances.	Construction	Contractor	X	
11.7	Construct bridges for watercourse crosses in the vicinity of Delta Ravines (i.e. Norum, McAdam, Collings, Nelson View and Gunderson Creeks), as shown in plans attached to the Application (Technical Volume 1) and over a minimum 450 m portion of the Fraser Heights Wetlands, using the design and the construction methods outlined in the draft Fraser Heights Wetlands Bridge Preliminary Design Report.	Pre-construction; construction	Contractor	N/A	
11.8	Obtain input from the Musqueam Indian Band and other participating First Nations to identify appropriate measures to mitigate potential project related impacts on the identified interests of the Musqueam Band in relation to fisheries and habitat matters. Identify potential opportunities for mutually agreeable opportunities to assist in advancing the fisheries interests of the Musqueam Indian Band or other participating First Nations.	All phases	MoT, contractor	X	
11.9	Review with the applicable regulatory agencies, including but not limited to DFO and MOE, proposals for compensation habitat, including opportunities for habitat to be constructed in advance of other Project construction (i.e. "habitat banking"), to determine the ratio of habitat types and to which drainage compensation will apply.	Pre-construction	Contractor	X	
11.10	Follow BMPs in the construction of all new ditches and stormwater watercourses.	Construction	Contractor	X	

11.11	Retain maintenance responsibility for compensation sites within the Project limits. For sites constructed in areas outside of the Project limits, establish site-specific agreements for access and maintenance with the relevant stakeholder/landowner.	Operations	Contractor		
12.0 Water Quality					
12.1	Ensure that the construction works and operations for the Project are conducted in compliance with environmental requirements and BMPs in order to avoid impacts to water quality.	All phases	Contractor	X	
12.2	Develop and implement a Surface Water Quality and Sediment Control Plan and provide the plan for review and comment by relevant environmental agencies at least 30 calendar days prior to the start of relevant construction activities.	Pre-construction	Contractor	X	
12.3	Sample water from potentially impacted drinking water wells to assess potential adverse effects to water quality associated with during construction and operation phases of the project. Provide sampling water quality data to the local health authority for review and comment.	Construction; operation	Contractor	TBD	
12.4	The Surface Water Quality and Sediment Control Plan will at a minimum: - Identify requirements for additional water quality monitoring prior to and during construction to ensure preventative and mitigation measures can be taken as appropriate, to avoid impacts to water quality; - Identify potential water quality contaminants of concern generated by construction activities and associated preventative and mitigative measures; - Include a BMP maintenance plan to ensure BMPs implemented are functioning as designed and corrective actions are taken when required; and - Be submitted to the applicable regulatory agencies at least 30 calendar days prior to start of construction activities for review.	Pre-construction; construction	Contractor	X	
13.0 Wildlife and Vegetation					
13.1	Ensure that the design, construction, and operation of the project, avoids where practical and technically feasible, impacts to vegetation and wildlife.	All phases	Contractor	X	
13.2	Prepare and implement a Wildlife and Habitat Management Plan to avoid and, where necessary, mitigate potential impacts to vegetation, wildlife and wildlife habitat. Provide the Plan to relevant regulatory and reviewing agencies for review and comment at least 30 calendar days prior to relevant construction activities beginning. The Wildlife and Habitat Management Plan will include best practices including but not limited to those identified in the Application (Table 7.717, draft Wildlife Mitigation Crossing Plan (April 2007) [replaced by the Wildlife and Wildlife Habitat Mitigation Plan (September 2008)], and Zones of Influence memo (July 2007) [replaced by the Wildlife and Wildlife Habitat Mitigation Plan (September 2008)] in order to avoid, and where necessary, mitigate potential effects on vegetation and wildlife. This plan will also identify protocols for the survey and salvage of vegetation and wildlife as appropriate and required.	Pre-construction; construction	Contractor	X	
13.3	Develop and implement mitigation measures to avoid and minimize impacts to wildlife during construction and operation of the project including, but not limited to those measures identified in the Application (September, 2006), draft Wildlife Mitigation Crossing Plan (April 2007) [replaced by the Wildlife and Wildlife Habitat Mitigation Plan (September 2008)] and Zones of Influence Assessment memo (July 2007) [replaced by the Wildlife and Wildlife Habitat Mitigation Plan (September 2008)].	Pre-construction; construction	Contractor	X	

13.4	During the design phase, MoT will finalize its determination of the type and location of sound barriers to be constructed along the perimeter of Burns Bog. For the south-western alignment (adjacent to Crescent Slough), this design will include the construction of a solid sound barrier or a barrier that will provide equivalent mitigation. MoT will ensure on-going consultation with TC, EC, MoE and other IAERC members as appropriate, during design regarding the proposed type and location of sound barriers to be installed around Burns Bog.	Pre-construction	MoT, Contractor	TBD	
13.5	Consult with the MoE and the Canadian Wildlife Service (CWS) of Environment Canada, to identify suitable compensation, including but not limited to that identified in the Wildlife and Habitat Management Plan and Habitat Compensation Plan (February, 2007) [replaced by Habitat Compensation Plan (May 2007)], to address residual effects on vegetation and wildlife as a result of the Project.	Pre-construction	Contractor	X	
13.6	Work with reviewing and regulatory agencies to develop and implement a comprehensive and long term Mitigation Monitoring Plan (MMP) [currently known as the SFPR Vegetation and Wildlife Mitigation Monitoring Plan], based on the Vegetation and Wildlife Mitigation Monitoring Strategy (April 2007) [replaced by the SFPR Vegetation and Wildlife Mitigation Monitoring Plan], to monitor the effectiveness of proposed mitigation measures in addressing Project-related effects on vegetation and wildlife, including species at risk. Data collection and monitoring in support of the implementation of the MMP will begin prior to construction and continue for a period of time, to be determined with relevant regulatory agencies, during operation. Information collected in relation to the MMP will be used to guide detailed planning of mitigation, assess the effectiveness of such mitigation, and determine where additional measures may be required. The MMP will include scientifically defensible thresholds or performance measures to facilitate the evaluation of the effectiveness of mitigation.	All phases	Contractor	X	
13.7	Undertake site-specific vegetation surveys in accordance with the regionally supported Protocols for Rare Plants Surveys, to identify the presence and distribution of red- and blue-listed plants species prior to final design and construction. Provide information on the presence and distribution of such plants species to MoE for review and use the information to guide final design and construction to avoid or mitigate impacts to these species.	Pre-construction	Contractor	X	
13.8	Avoid direct impacts to sensitive red and blue listed plant communities where possible and adhere to construction exclusion windows determined by regulators.	Construction	Contractor	X	
13.9	Develop a plan for salvaging plants and seeds, for review by MoE, where impacts to red and blue listed plant species cannot be avoided, for replanting off-alignment.	Pre-construction	Contractor		
13.10	Make all reasonable efforts to avoid impacts to confirmed streambank lupine habitat and confirmed stream bank lupine seed banks in the project corridor, as identified in consultation with the Streambank lupine recovery team, during design construction and operation of the Project. Where impacts to such areas cannot be avoided, work with the Ministry of Environment and the Streambank Lupine Recovery team to identify and carry out appropriate mitigation measures including, but not limited to, the stockpiling of soil containing streambank lupine seeds.	Construction	Contractor	X	

13.11	Undertake pre-construction bird nest surveys and restrict clearing during the breeding season. Pre- construction bird nest surveys will include, but not necessarily be limited to the following: - Conduct pre-construction raptor, heron or any listed species nest and roost tree surveys, consistent with applicable BMPs, to determine presence of active/inactive raptor and heron nests in the corridor and work scheduling with respect to the nest locations and applicable timing restrictions; - Prepare pre-construction bird nest survey protocols should works include clearing of vegetation during the general bird breeding time period as determined by MOE; - Conduct pre-construction bird nest surveys to the satisfaction of the MOE should the Design-Builder intend to seek approval from the MOE for vegetation clearing within the bird breeding time period (defined by MOE) in any year during the Term.	Pre-construction	Contractor	X	
13.12	Consult with MoE on the development and implementation of an Invasive Species Management Plan to address potential effects of the project related to the spread of invasive plant and aquatic wildlife species within the project corridor.	Pre-construction; construction	Contractor	X	
13.13	Include large mammal crossings adjacent to the perimeter of Burns Bog. The final number and location of wildlife crossings will be identified in the Wildlife Mitigation Crossing Plan [replaced by the Wildlife and Wildlife Habitat Mitigation Plan (September 2008)] which will be finalized in consultation with MoE and EC.	Pre-construction	Contractor	X	
13.14	Follow the design criteria outlined in the MOT Manual of Aesthetic Design Practice and the MOT Landscape Policy and Design Standards that form the landscape and site restoration design criteria for the Project.	Pre-construction; construction	Contractor	X	
13.15	Use data collected through the MOT administered Wildlife Accident Reporting System to identify areas of increased wildlife collisions and to monitor direct effects on wildlife.	Operations	Contractor	TBD	
13.16	Identify the location of sensitive wildlife habitats, including but not limited to habitat for species at risk, red and blue listed plant communities and high biodiversity habitats, on detailed design drawings in order to avoid or minimize potential effects to these areas.	Pre-construction	Contractor	X	
14.0 Species at Risk					
14.1	Ensure that all reasonable measures are taken to avoid or lessen effects of the Project on listed wildlife species and their critical habitat and that potential effects that could occur are monitored. All mitigation and monitoring measures will be undertaken in a manner that is consistent with applicable recovery strategy and actions plans.	Pre-construction; construction	MoT, contractor	X	
14.2	Undertake a salvage program for Pacific water shrew from, at a minimum, high and moderate-rated habitat adjacent to the SFPR. Other areas potentially requiring salvage will include lower-rated habitat, connected to higher-rated habitat, and will be determined in consultation with MoE and the PWS Recovery Team.	Pre-construction; construction	Contractor	X	
14.3	Consult with MoE regarding the mitigation of potential effects on Pacific water shrew, and take all practical steps to apply the most recent Pacific water shrew best management practices to address potential effects, including identifying additional opportunities to avoid direct effects to areas, designated as critical habitat by the PWS Recovery Team, during design, construction and operation.	Pre-construction; construction	Contractor	TBD	

14.4	Consult with MOE to develop a mitigation and compensation strategy for Pacific water shrew, where opportunities are available, based on habitat quality and connectivity to surrounding habitat. Undertake sampling program, where required, to determine the presence and distribution of Pacific water shrew to support detailed design of mitigation.	Pre-construction; construction	MoT, Contractor	TBD	
14.5	Detailed design of wildlife crossing mitigation for southern red-backed vole (RBV) will be conducted assuming the presence of RBV in high and moderate rated habitat identified in the EA. Monitoring of the use of wildlife crossing structures will include provisions for assessing the use of such structures by RBV.	Pre-construction	Contractor	TBD	
14.6	Undertake a review of local museum specimens to confirm the distribution of <i>Sorex rowheri</i> within the Lower Fraser Valley. Where possible, use findings to support detailed design of mitigation.	Pre-construction	Contractor	TBD	
14.7	Use information obtained through the Mitigation Monitoring Plan [currently known as the SFPR Vegetation and Wildlife Mitigation Monitoring Plan (February 2008)] to support detailed planning of mitigation to address potential noise, visual and collision effects of the project on barn owl. Undertake long term monitoring of the effectiveness of such mitigation as part of the implementation of the Mitigation Monitoring Plan [currently known as the SFPR Vegetation and Wildlife Mitigation Monitoring Plan (February 2008)].	All phases	Contractor	TBD	
14.8	Use information obtained through the Mitigation Monitoring Plan [currently known as the SFPR Vegetation and Wildlife Mitigation Monitoring Plan (February 2008)] to support detailed planning of mitigation, including pre-construction salvage where appropriate, to address potential effects of the project, including those related to collision and changes in hydrology, on red-legged frog and western toad. Undertake long term monitoring of the effectiveness of such mitigation as part of the implementation of the Mitigation Monitoring Plan [currently known as the SFPR Vegetation and Wildlife Mitigation Monitoring Plan (February 2008)].	All phases	Contractor	X	
14.9	Consult with MOE to plan and undertake at least one preconstruction, one construction and two operational inventories of at-risk aquatic insects in habitat known to or suspected of supporting such species and potentially affected by the project, including but not necessarily limited to the Fraser Heights Wetland, to confirm the findings of the environmental assessment and to monitor potential impacts of the project on aquatic insects.	All phases	Contractor	X	
14.10	Consult with the Canadian Wildlife Service to develop and implement a Mitigation Monitoring Plan [currently known as the SFPR Vegetation and Wildlife Mitigation Monitoring Plan] to monitor and assess the effectiveness of measures proposed to avoid or mitigate potential effects on Sandhill Crane. The Plan will identify: - species habitat requirements; - existing conditions in the project area; - potential project related effects and mitigation; - core indicators for assessing the effectiveness of mitigation; and - proposed study methodology and data interpretation and reporting protocols.	Pre-construction; construction	MoT	TBD	
15.0 Burns Bog					
15.1	Avoid potentially significant impacts to hydrological and ecological values associated with Burns Bog (i.e. alignment refinements to avoid ecological and hydrological values, development of hydrological mitigation that meet the hydrologic objectives identified).	All phases	MoT, Contractor	X	

15.2	Consult with the MV, CoD, MoE, EC, and the Burns Bog Management Planning Committee (BBMPC) and Scientific Advisory Panel (SAP) to ensure design, construction and operation of the Project complements long term management objectives established for the Burns Bog Ecological Conservation Area.	All phases	Contractor	TBD	
15.3	Consult with the reviewing agencies to finalize construction and post construction monitoring requirements related to Burns Bog including, but not limited to, those identified in the Vegetation and Wildlife Mitigation Monitoring Strategy (April 2007) [replaced by the SFPR Vegetation and Wildlife Mitigation Monitoring Plan]. Monitoring requirements with respect to Burns Bog will include but not be limited to those relating to: air quality, water quality, water levels, red-listed plant communities, and wildlife	Construction, operation	Contractor	X	
15.4	Share environmental data from Burns Bog collected as part of the development of the SFPR project, with agencies responsible for the management of the Burns Bog Ecological Conservancy Area in order to support the implementation of the long term management plan for the Bog.	All phases	Contractor	TBD	
15.5	Design, construct and operate hydrology mitigation infrastructure, to mitigate potential effects of the project on the hydrology of Burns Bog, in a way that meets the following performance objectives: - Site specific solutions – the design, construction and operation of hydrology mitigation will be based on, and take into account, site specific conditions. - Compatibility between highway water management and bog water management – Providing for active water level controls in the Bog that are independent of SFPR-related water management. - Prevention of mineral migration into the Bog. – Where indicated, providing a low permeability barrier between the SFPR highway ditch and the lagg ponds/ditches by: using material to construct the berm that supports appropriate vegetation on the berm and prevents the introduction of mineral material into the Bog; and maintaining hydraulic gradients so that Type 1 bog waters flow toward the highway at all times. - Resilience – Providing a design that is sufficiently robust to maintain and actively manage water levels under average and extreme conditions and if Bog conditions change. - Highway and mitigation construction does not preclude future restoration of Burns Bog – Providing flexibility of design that allows, for example, for future water control structures that allow for raising of water level as part of future bog restoration. - Holistic design – Hydrology mitigation concepts are designed in way that ensure they will be compatible with, and help achieve multiple, mitigation requirements. As the design of hydrology mitigation is advanced, it will be documented in a Hydrology Work Plan [currently known as Hydrology Workplan (Burns Bog)]. This document will be finalized prior to commencement of pre-load activities around Burns Bog.	All phases	MoT	TBD	
15.6	Pre-load activities around Burns Bog, including areas north of the Highway 99 interchange and west of Nordel Way, will not commence until TC (and other decision-making authorities as required) has reviewed and is satisfied with the final Hydrology Work Plan and the status of the hydrology mitigation design.	Pre-construction	MoT	TBD	

15.7	Provide opportunities for the active involvement of agencies responsible for the management of the Burns Bog Ecological Conservancy Area, and the Scientific Advisory Panel (SAP), in the design, construction and operation of project related works adjacent to Burns Bog including but not limited to those proposed as mitigation for potential project related effects.	All phases	MoT, contractor	TBD	
15.8	Consult with MV, CoD, EC and MoE on the development of a water balance model and a drainage model to support the design, construction and operation of hydrology mitigation infrastructure adjacent to Burns Bog and support implementation of the Burns Bog Ecological Conservancy Area Management Plan.	Pre-construction	Contractor	TBD	
15.9	Finalize an Air Quality Management Plan [currently known as SFPR Air Quality Management Plan (Burns Bog Segment)], in consultation with TC, EC and other IAERC members as appropriate, prior to commencing pre-loading activities around Burns Bog. This document will identify all technically and economically feasible mitigation measures to be implemented to prevent generation and transmission of dust during the pre-load and construction phases of the project.	Pre-construction	MoT, contractor		X
15.10	Collect a minimum of 4 months of baseline dust fall monitoring between June and September 2008. Following the collection of this information, the MoT will meet with TC and EC to discuss the baseline monitoring information collected and the approach for continued data collection, prior to the commencement of pre-loading activities around Burns Bog (i.e., north of the Highway 99 interchange and west of Nordel Way).	Pre-construction	MoT		X
15.11	Work co-operatively with the Tsawwassen First Nation to maintain appropriate access for TFN members to Burns Bog to facilitate TFN's harvesting rights pursuant to the Tsawwassen Final Agreement.	All phases	MoT, Contractor	TBD	
15.12	Ensure that the development and operation of Stormwater management infrastructure does not compromise the ability to achieve hydrology mitigation objectives adjacent to Burns Bog.	All phases	MoT, Contractor	TBD	
15.13	Implement the monitoring and follow-up activities identified in the Screening document, for a period of five years after the project has commenced operation, to ensure the effectiveness of mitigation measures related to aerial deposition, hydrology, and Sandhill crane in the vicinity of Burns Bog.	All phases	MoT, Contractor	TBD	

[illegible]

17.0 Heritage					
17.1	Ensure that the design, construction and operation of the proposed project is advanced in a way that avoids, or minimizes potential impacts to heritage buildings	All phases	MoT, contractor	X	
17.2	Consult with the Delta Heritage Advisory Commission and the Surrey Heritage Committee to define heritage interests and work with the Delta Museum and Archive to develop a photo record and inventory of potentially affected heritage houses.	Pre-construction, construction	Contractor	N/A	
17.3	Prior to construction, undertake pre-condition surveys with respect to heritage buildings, as further described in commitment 9.9.	Pre-construction	Contractor	N/A	
17.4	Avoid, where practical and technically feasible, direct impacts to heritage buildings.	All phases	Contractor	NA/	
18.0 Navigable Waters					
18.1	Obtain regulatory approval related to crossings of designated Navigable Waters pursuant to the Navigable Waters Protection Act (NWPA), including but not necessarily limited to, McAdam Creek, Collings Creek, Manson Canal, and Crescent Slough, prior to commencement of works.	Pre-construction, construction	MoT, Contractor	N/A	
19.0 Socio-economic					
19.1	Mitigate potential Project-related visual/lighting impacts through use of screening, fencing and landscaping in consultation with local government. Use dark-sky compliant lighting for the Project.	Pre-construction, construction	Contractor	TBD	
19.2	Manage potential impacts to emergency response services by: - Ensuring emergency response plans (including a Spill Response Management and Emergency Response Plan) are in place during the construction phase of the Project, and updated annually, at a minimum; - Consulting first responders in Traffic Management Plan development; and - Consulting with local fire departments to ensure adequate access.	Pre-construction, construction	Contractor	X	
20.0 Rail					
20.1	Avoid or minimize potential impacts from Project works and activities to rail corridors.	All phases	Contractor	X	
20.2	Notify Transport Canada of project works as required under the <i>Notice of Railway Works Regulations</i> . Notify the public and affected stakeholders in accordance with the <i>Railway Safety Act</i> .	All phases	Contractor	TBD	
20.3	Comply with Canadian transportation standards and regulations as well as the design specifications of the respective railway with regard to vertical and horizontal railroad clearance of new or upgraded infrastructure.	Pre-construction	Contractor	TBD	
20.4	Minimize railroad closures during construction.	Construction	Contractor	X	

APPENDIX 7: WATER QUALITY DATA

Site Code	Site	Date	Time	Water Temp (°C)	DO (mg/L)	Conductivity (mS/cm)	pH	TDS (ppt)	Turbidity (NTU)	Comments
WQ-12	Fortis Culvert DS	02/11/2020	01:00	9.6	4.38	0.35	4.75	0.17	3.0	Sampling done during night shift
WQ-12	Fortis Culvert DS	02/11/2020	03:00	8.4	4.25	0.45	4.80	0.25	5.2	Sampling done during night shift
WQ-2	Silda DitchMS	02/11/2020	13:15	11.6	4.98	0.22	7.20	0.16	7.9	
WQ-3	Silda DitchDS	02/11/2020	13:20	11.7	6.77	0.16	6.91	0.09	12.1	
WQ-4	Fraser RrInlet	02/11/2020	13:00	11.4	8.37	0.26	7.84	0.13	92.8	High tide, coming in
WQ-11	Fortis Culvert US	02/11/2020	13:30	12.4	4.06	0.10	5.08	0.06	3.0	No instream works today
WQ-12	Fortis Culvert DS	02/11/2020	13:35	12.1	5.98	0.11	4.71	0.05	3.5	No instream works today
WQ-11	Fortis Culvert US	03/11/2020	01:30	11.4	4.53	0.80	4.95	0.07	3.8	Nightshift- dewatering and instream works
WQ-12	Fortis Culvert DS	03/11/2020	01:00	11.5	4.09	0.73	4.85	0.11	5.9	Nightshift- dewatering and instream works
WQ-2	Silda DitchMS	03/11/2020	11:00	10.7	7.00	0.31	6.69	0.15	36.2	Heavy rain while sampling
WQ-12	Fortis Culvert DS	02/11/2020	01:00	9.6	4.38	0.35	4.75	0.17	3.0	Sampling done during night shift
WQ-3	Silda DitchDS	03/11/2020	10:50	10.6	6.99	0.32	6.67	0.16	64.5	Heavy rain while sampling. Sand washouts noticed ~6 m US. Observed turbidity passing through straw waddle into stream from washout direction. Dispatched crew to re- build washout, remove sediment in runoff path, and install ESC measures.
WQ-4	Fraser RrInlet	03/11/2020	10:00	10.6	8.77	0.16	8.00	0.08	95.5	High tide, going out. Heavy rain while sampling.
WQ-11	Fortis Culvert US	03/11/2020	10:30	9.6	5.60	0.10	5.32	0.05	8.5	Heavy rain while sampling. No instream works.
WQ-12	Fortis Culvert DS	03/11/2020	10:30	9.1	8.21	0.10	5.29	0.05	3.4	Heavy rain while sampling. No instream works.
WQ-2	Silda DitchMS	04/11/2020	13:05	10.9	4.23	0.28	6.73	0.12	19.8	Heavy rain during sampling and Fraser River high tide moving out had an impact on the turbidity as water levels were higher than normal.
WQ-3	Silda DitchDS	04/11/2020	13:00	11.1	6.17	0.22	6.82	0.16	25.6	Heavy rain during sampling and Fraser River high tide moving out had an impact on the turbidity as water levels were higher than normal.
WQ-4	Fraser RrInlet	04/11/2020	10:30	11.5	7.85	0.14	7.95	0.07	70.6	High tide, going out. Heavy rain while sampling.
WQ-11	Fortis Culvert US	04/11/2020	11:15	11.2	5.76	0.11	5.22	0.06	4.8	No instream works.
WQ-12	Fortis Culvert DS	04/11/2020	11:15	11.0	7.22	0.10	5.06	0.05	2.6	No instream works.
WQ-2	Silda DitchMS	05/11/2020	11:25	9.6	4.97	0.13	6.79	0.08	5.9	
WQ-3	Silda DitchDS	05/11/2020	11:30	9.5	5.21	0.13	6.92	0.08	7.1	Spillway installed at previous washouts on night shift prior to sampling
WQ-4	Fraser RrInlet	05/11/2020	10:30	9.2	8.49	0.04	7.59	0.04	70.6	High tide
WQ-11	Fortis Culvert US	05/11/2020	10:50	9.2	5.09	0.10	5.46	0.05	2.9	No instream works.
WQ-12	Fortis Culvert DS	05/11/2020	10:45	9.4	4.07	0.10	4.83	0.05	3.2	No instream works.
WQ-2	Silda DitchMS	06/11/2020	10:00	9.4	4.77	0.14	6.65	0.07	6.4	
WQ-3	Silda DitchDS	06/11/2020	10:05	9.2	5.96	0.16	6.68	0.08	6.8	
WQ-4	Fraser RrInlet	06/11/2020	10:20	9.2	8.49	0.04	7.59	0.04	1.8	High tide
WQ-11	Fortis Culvert US	06/11/2020	10:55	9.2	4.87	0.10	5.50	0.05	2.5	No instream works
WQ-12	Fortis Culvert DS	06/11/2020	11:00	9.5	3.59	0.09	4.65	0.04	1.4	No instream works
WQ-2	Silda DitchMS	08/11/2020	13:00	7.1	5.87	0.13	6.59	0.06	5.9	-
WQ-3	Silda DitchDS	08/11/2020	13:05	7.6	4.69	0.15	6.98	0.08	11.6	-
WQ-4	Fraser RrInlet	08/11/2020	12:00	8.9	9.12	0.06	7.94	0.05	92.4	High tide
WQ-11	Fortis Culvert US	08/11/2020	12:10	7.4	4.11	0.10	5.23	0.06	3.7	-
WQ-12	Fortis Culvert DS	08/11/2020	12:15	7.5	3.90	0.10	4.99	0.05	3.6	Sampling location in grass along bank
WQ-2	Silda DitchMS	09/11/2020	12:00	7.4	6.06	0.33	6.58	0.16	8.9	-
WQ-3	Silda DitchDS	09/11/2020	11:55	7.4	9.06	0.34	6.54	0.17	13.4	-

Site Code	Site	Date	Time	Water Temp (°C)	DO (mg/L)	Conductivity (mS/cm)	pH	TDS (ppt)	Turbidity (NTU)	Comments
WQ-4	Fraser Rrinlet	09/11/2020	10:45	8.7	9.54	0.14	7.23	0.07	80.2	Mid-tide, coming in
WQ-11	Fortis Culvert US	09/11/2020	11:15	7.4	5.59	0.10	5.20	0.05	4.1	-
WQ-12	Fortis Culvert DS	09/11/2020	11:10	6.7	5.22	0.09	4.71	0.05	1.8	Sampling location in grass along bank
WQ-2	Silda DitchMS	12/11/2020	12:25	6.9	6.57	0.29	6.42	0.16	12.4	Raining whilesampling
WQ-3	Silda DitchDS	12/11/2020	12:30	7.0	8.73	0.32	6.71	0.16	20.1	Raining whilesampling
WQ-4	Fraser Rrinlet	12/11/2020	8:00	7.9	9.66	0.15	7.86	0.06	81.7	Low tide, coming in
WQ-2	Silda DitchMS	13/11/2020	14:55	9.1	7.77	0.16	6.46	0.08	12.2	Ditch runninghigh ~50mm of rain in 24 hr
WQ-3	Silda DitchDS	13/11/2020	15:00	10.3	6.73	0.15	6.41	0.07	14.3	Ditch runninghigh ~50mm of rain in 24 hr
WQ-4	Fraser Rrinlet	13/11/2020	13:40	7.7	9.05	0.15	7.18	0.07	47.0	High tide, coming in
WQ-2	Silda DitchMS	16/11/2020	14:25	8.1	7.83	0.07	5.52	0.04	4.3	Ditch runninghigh, raining
WQ-3	Silda DitchDS	16/11/2020	14:30	8.7	6.73	0.08	5.66	0.04	5.2	Ditch runninghigh, raining
WQ-4	Fraser Rrinlet	16/11/2020	13:30	8.9	9.14	0.19	7.04	0.10	27.3*	High-tide, coming in, raining
WQ-2	Silda DitchMS	17/11/2020	12:30	7.9	7.13	0.19	5.67	0.09	4.0	Ditch runninghigh, raining
WQ-3	Silda DitchDS	17/11/2020	12:25	8.2	5.84	0.18	5.92	0.09	5.8	Ditch runninghigh, raining
WQ-4	Fraser Rrinlet	17/11/2020	12:15	8.4	8.99	0.24	7.26	0.12	43.8*	High-tide, coming in, raining
WQ-2	Silda DitchMS	18/11/2020	15:35	9.2	6.24	0.11	5.99	0.05	9.7	Ditch runninghigh, raining
WQ-3	Silda DitchDS	18/11/2020	15:30	9.5	6.39	0.12	6.23	0.06	14.2	Ditch runninghigh, raining
WQ-4	Fraser Rrinlet	18/11/2020	14:00	8.1	8.16	0.15	6.91	0.07	23.3*	High tide, coming in, raining
WQ-2	Silda DitchMS	19/11/2020	14:40	9.0	6.03	0.11	5.95	0.06	9.2	-
WQ-3	Silda DitchDS	19/11/2020	14:35	9.6	4.51	0.12	6.17	0.06	6.9	-
WQ-4	Fraser Rrinlet	19/11/2020	14:00	8.9	8.49	0.12	6.76	0.06	17.5*	High tidegoing out
WQ-2	Silda DitchMS	20/11/2020	11:45	8.6	6.27	0.11	6.01	0.06	9.7	-
WQ-3	Silda DitchDS	20/11/2020	11:50	8.4	5.12	0.11	6.12	0.05	8.7	-
WQ-4	Fraser Rrinlet	20/11/2020	11:00	8.8	9.01	0.13	7.06	0.06	30.1*	Mid-tide, coming in
WQ-2	Silda DitchMS	23/11/2020	16:00	8.2	7.16	0.25	6.35	0.12	12.1	
WQ-3	Silda DitchDS	23/11/2020	16:05	8.7	5.38	0.24	6.28	0.12	8.3	
WQ-4	Fraser Rrinlet	23/11/2020	12:30	8.4	4.03	0.13	7.05	0.07	20.4	High tide
WQ-3	West Ditch (Area I3)	23/11/2020	15:50	10.2	4.53	0.12	6.14	0.06	6.7	
WQ-2	Silda DitchMS	24/11/2020	13:20	8.9	3.95	0.24	6.33	0.12	11.0	
WQ-3	Silda DitchDS	24/11/2020	13:15	9.4	4.25	0.22	6.58	0.11	10.0	
WQ-4	Fraser Rrinlet	24/11/2020	11:50	8.7	6.33	0.14	7.17	0.07	13.8	High tide coming in
WQ-2	Silda DitchMS	25/11/2020	9:00	8.7	4.12	0.24	6.29	0.13	7.6	
WQ-3	Silda DitchDS	25/11/2020	9:05	9.1	5.06	0.23	6.48	0.12	8.2	
WQ-4	Fraser Rrinlet	25/11/2020	8:30	8.6	8.97	0.14	7.03	0.07	14.9	Mid-tide, coming in
WQ-2	Silda DitchMS	26/11/2020	14:40	10.1	9.24	0.23	6.13	0.11	8.3	Raining whilesampling
WQ-3	Silda DitchDS	26/11/2020	14:35	11.1	4.69	0.23	6.29	0.11	7.3	Raining whilesampling
WQ-4	Fraser River Inlet	26/11/2020	13:45	10.9	8.35	0.13	6.93	0.07	11.2	High tide coming in. Raining whilesampling.
WQ-2	Silda DitchMS	27/11/2020	7:45	8.8	4.59	0.24	6.24	0.12	7.6	
WQ-3	Silda DitchDS	27/11/2020	7:50	9.0	5.19	0.23	6.51	0.12	8.4	
WQ-4	Fraser Rrinlet	27/11/2020	8:00	8.6	9.06	0.14	7.09	0.07	19.7	Mid-tide going out
WQ-2	Silda DitchMS	01/12/2020	9:45	8.8	4.59	0.24	6.24	0.12	7.6	
WQ-3	Silda DitchDS	01/12/2020	9:50	9.0	5.19	0.23	6.51	0.12	8.4	
WQ-4	Fraser Rrinlet	01/12/2020	9:00	8.6	9.06	0.14	7.09	0.07	19.7	High tide coming in
WQ-2	Silda DitchMS	03/12/2020	11:15	8.6	4.61	0.23	6.16	0.12	7.1	
WQ-3	Silda Ditch DS	03/12/2020	11:20	8.5	5.94	0.24	6.43	0.12	7.9	
WQ-4	Fraser Rrinlet	03/12/2020	10:45	8.7	8.77	0.13	7.39	0.07	22.5	Mid tide going out
WQ-2	Silda DitchMS	08/12/2020	14:40	10.1	9.24	0.23	6.13	0.11	8.3	-
WQ-3	Silda DitchDS	08/12/2020	14:35	11.1	4.69	0.23	6.29	0.11	7.3	-
WQ-4	Fraser Rrinlet	08/12/2020	13:45	10.9	8.35	0.13	6.93	0.07	11.2	Mid tide going out
WQ-2	Silda DitchMS	10/12/2020	12:30	10.4	8.71	0.24	6.19	0.12	9.1	-
WQ-3	Silda DitchDS	10/12/2020	12:35	11.3	5.43	0.23	6.33	0.11	6.9	-
WQ-4	Fraser Rrinlet	10/12/2020	13:15	11.2	9.12	0.14	6.98	0.07	13.9	High tide
WQ-2	Silda DitchMS	15/12/2020	15:10	9.4	6.69	0.30	6.41	0.15	10.9	
WQ-3	Silda DitchDS	15/12/2020	15:15	11.1	4.84	0.31	6.35	0.16	22.2*	Likely due to rain/wind with potentialto disturb sediment & turbid river athigh tide mixing at Siteinterface. No work occurring between mid-& DS locations.
WQ-4	Fraser Rrinlet	15/12/2020	15:30	8.1	5.67	0.17	7.30	0.08	37.1*	High tide
WQ-2	Silda DitchMS	17/12/2020	13:45	10.2	7.12	0.20	6.34	0.10	11.1	
WQ-3	Silda DitchDS	17/12/2020	13:40	11.0	7.01	0.19	6.37	0.09	10.40	
WQ-4	Fraser Rrinlet	17/12/2020	14:00	7.3	13.81	0.13	7.25	0.06	47.4*	Mid tide, inflow
WQ-2	Silda DitchMS	22/12/2020	12:40	6.9	12.28	0.15	6.31	0.08	3.8	
WQ-3	Silda Ditch	22/12/2020	12:35	7.2	6.92	0.26	6.44	0.13	7.77	

Site Code	Site	Date	Time	Water Temp (°C)	DO (mg/L)	Conductivity (mS/cm)	pH	TDS (ppt)	Turbidity (NTU)	Comments
	DS									
WQ-4	Fraser River Inlet	22/12/2020	12:10	7.3	8.34	0.13	6.50	0.06	11.2	High tide
2	Silda ditchMS	05/01/2021	10:45	7.0	9.63	0.12	6.77	0.06	8.7	
3	Silda ditch DS	05/01/2021	10:30	7.5	7.70	0.16	6.64	0.08	10.30	
4	Fraser River	05/01/2021	10:20	7.6	7.82	0.36	7.01	0.18	37.4	Mid tide coming in
-	S4 pump intake	06/01/2021	7:30	8.29	-	-	-	-	-	-
-	S4 pump discharge after passing through channel	06/01/2021	7:35		10.6	-	-	-	-	-
-	Cougar Creek US of effluent	06/01/2021	8:30		2.36	-	-	-	-	-
-	Cougar Creek DS of effluent	06/01/2021	9:00		3.60	-	-	-	-	-
2	Silda ditchMS	07/01/2021	13:35	7.2	4.99	0.14	6.93	0.07	42.2	High tide
3	Silda ditch DS	07/01/2021	13:30	7.9	5.82	0.18	6.71	0.09	7.94	
4	Fraser River	07/01/2021	13:00	7.6	8.71	0.34	6.86	0.17	9.21	High tide
2	Silda ditchMS	2021/01/12	9:00	7.2	3.67	0.12	6.58	0.06	10.4	
3	Silda ditch DS	2021/01/12	9:05	7.8	4.83	0.16	6.79	0.08	7.94	
4	Fraser River	2021/01/12	8:30	7.6	7.21	0.32	7.08	0.16	36.3	Mid tide going out
13	Cougar Creek US	2021/01/13	13:30	-	-	-	-	-	3.64	No pumping from S4 for past 48 hours
14	Cougar Creek DS	2021/01/13	13:40	-	-	-	-	-	2.04	no pumping from S4 for past 48 hours
N/A	96 Street US	17-JAN-21	20:00	9.2	6.25	0.19	6.23	0.25	2.8	Dewatering activities
N/A	96th Street DS	17-JAN-21	20:15	9.5	6.20	0.10	6.67	0.36	3.0	Dewatering activities
2	Silda DitchMS	18-JAN-21	10:00	6.4	6.67	0.37	6.50	0.18	8.36	-
3	Silda DitchDS	18-JAN-21	10:00	6.6	8.22	0.18	6.74	0.09	13.10	-
4	Fraser River	18-JAN-21	10:30	5.4	11.03	0.13	7.19	0.06	9.58	Mid-tide going out
5	96 Street US	18-JAN-21	11:15	6.4	7.12	0.03	4.51	0.02	1.30	No dewatering activities
6	96th Street DS	18-JAN-21	11:00	6.4	12.42	0.05	5.24	0.02	1.54	No dewatering activities
13	Cougar Creek US	18-JAN-21	10:15	6.8	9.64	0.20	6.98	0.10	1.34	No dewatering activities
14	Cougar Creek DS	18-JAN-21	10:20	6.9	9.24	0.21	7.02	0.11	2.24	No dewatering activities
TEMP	A	18-JAN-21	11:30	6.4	8.39	0.02	4.29	0.01	0.77	-
TEMP	B	18-JAN-21	11:20	6.8	4.85	0.21	5.57	0.10	6.02	-
TEMP	C	18-JAN-21	11:50	7.0	6.40	0.11	5.64	0.06	2.14	-
TEMP	D	18-JAN-21	11:55	6.7	9.27	0.10	5.72	0.05	5.66	-
TEMP	E	18-JAN-21	12:00	7.3	10.60	0.10	5.52	0.05	2.29	-
TEMP	F	18-JAN-21	12:30	7.6	3.36	0.14	5.72	0.07	3.38	-
TEMP	G	18-JAN-21	12:40	7.1	5.97	0.37	5.75	0.18	9.89	-
TEMP	H	18-JAN-21	13:00	9.2	6.36	0.19	5.81	0.09	7.83	-
TEMP	I	18-JAN-21	12:55	8.2	8.28	0.08	5.37	0.04	1.14	-
TEMP	J	18-JAN-21	13:30	8.0	6.43	0.06	5.34	0.03	1.14	-
TEMP	K	18-JAN-21	13:20	7.4	5.24	0.11	5.69	0.05	4.20	-
TEMP	L	18-JAN-21	13:40	7.9	3.72	0.04	3.94	0.02	1.74	-
TEMP	M	18-JAN-21	13:35	9.6	4.80	0.20	5.64	0.10	1.90	-
TEMP	N	18-JAN-21	14:00	8.5	5.63	0.09	5.31	0.05	1.02	-
N/A	96 Street US	18-JAN-21	23:30	4.8	6.66	0.85	6.63	0.15	3.6	Dewatering activities
N/A	96th Street DS	18-JAN-21	23:45	4.2	5.59	0.59	6.69	0.16	4.3	Dewatering activities
N/A	96 Street US	19-JAN-21	23:45	5.1	6.00	0.23	6.60	0.45	4.6	Dewatering activities
N/A	96th Street DS	19-JAN-21	23:15	5.3	5.23	0.22	6.45	0.46	7.3	Dewatering activities
N/A	Fraser River Inlet	20-JAN-21	10:20	6.9	5.29	0.13	6.91	0.06	8.78	-
N/A	Cougar Creek DS	20-JAN-21	10:20	8.8	6.93	0.22	6.64	0.11	1.38	No dewatering activities
N/A	Cougar Creek US	20-JAN-21	10:15	9.4	6.62	0.22	6.43	0.11	1.67	No dewatering activities
N/A	96th Street DS	20-JAN-21	13:30	7.3	0.48	0.04	5.50	0.02	0.96	-
N/A	96 Street US	20-JAN-21	13:45	7.4	0.24	0.04	5.12	0.02	0.93	-
N/A	Silda DitchMS	20-JAN-21	12:35	9.0	2.70	0.42	6.31	0.21	7.87	-
N/A	Silda Ditch DS	20-JAN-21	12:40	7.6	2.95	0.26	6.50	0.13	9.26	-
N/A	96 Street US	21-JAN-21	00:30	5.9	7.01	0.75	6.03	0.35	1.8	Dewatering activities
N/A	96 Street DS	21-JAN-21	00:55	4.7	6.25	0.34	6.17	0.46	1.3	Dewatering activities
N/A	96 Street US	21-JAN-21	21:30	3.8	3.45	0.95	5.67	0.32	1.90	Dewatering activities

Site Code	Site	Date	Time	Water Temp (°C)	DO (mg/L)	Conductivity (mS/cm)	pH	TDS (ppt)	Turbidity (NTU)	Comments
N/A	96 Street DS	21-Jan-21	22:00	3.6	4.05	0.72	0.04	0.35	1.25	Dewateringactivities
NA	96 StreetUS	24-Jan-21	23:30	2.3	3.00	0.23	6.33	0.75	1.8	Dewateringactivities
NA	96 StreetDS	24-Jan-21	23:55	2.5	2.45	0.19	6.37	0.86	2.3	Dewateringactivities
NA	Silda DitchDS	25-Jan-21	11:05	6.8	6.01	0.51	6.39	0.26	9.27	
NA	Silda DitchMS	25-Jan-21	11:00	6.8	8.21	0.52	6.45	0.26	9.75	
NA	Fraser River Inlet	25-Jan-21	11:40	6.1	13.93	1.17	6.87	0.59	4.98	Mid-tide going out
NA	96 StreetDS	25-Jan-21	12:00	5.5	9.21	0.06	5.65	0.03	0.78	
NA	96 StreetUS	25-Jan-21	12:15	5.0	5.91	0.05	5.11	0.03	0.99	
NA	Cougar CkDS	25-Jan-21	10:35	7.5	13.25	0.43	6.56	0.21	4.46	
NA	Cougar CkUS	25-Jan-21	10:40	8.2	14.02	0.41	6.35	0.21	4.02	
NA	96 StreetUS	26-Jan-21	13:30	2.1	1.11	0.33	6.63	0.88	0.9	Dewateringactivities
NA	96 StreetDS	26-Jan-21	13:55	2.1	1.98	0.32	6.39	0.79	1.3	Dewateringactivities
NA	96 StreetDS	27-Jan-21	00:25	2.5	7.31	0.17	5.95	0.63	2.90	Dewateringactivities
NA	96 StreetUS	27-Jan-21	00:45	2.3	6.51	0.25	5.74	0.53	1.95	Dewateringactivities
NA	96 StreetDS	28-Jan-21	02:00	4.1	4.44	0.22	6.13	0.33	3.90	Dewateringactivities
NA	96 StreetUS	28-Jan-21	02:35	4.3	7.90	0.14	6.00	0.48	2.10	Dewateringactivities
NA	Silda Ditch DS	29-Jan-21	11:05	8.4	8.38	0.24	6.27	0.12	7.56	
NA	Silda DitchMS	29-Jan-21	11:10	7.7	3.28	0.50	6.30	0.25	15.60	
NA	Fraser RrInlet	29-Jan-21	11:30	6.0	7.91	0.66	6.71	0.33	8.37	
NA	96 St DS	29-Jan-21	11:45	6.0	0.90	0.05	5.65	0.03	1.32	Dewateringactivities
NA	96 St DS	29-Jan-21	21:00	6.4	2.41	0.04	5.19	0.02	1.12	Dewateringactivities
NA	96 StreetDS	31-Jan-21	21:00	3.5	0.33	0.91	5.78	0.23	1.89	Dewateringactivities
NA	96 StreetUS	31-Jan-21	21:45	3.2	1.99	0.67	5.39	0.42	1.45	Dewateringactivities
NA	96 StreetUS	1-Feb-21	23:00	3.0	0.11	0.75	5.89	0.08	2.90	Dewateringactivities
NA	96 StreetDS	1-Feb-21	23:30	3.0	0.89	0.95	5.79	0.06	1.90	Dewateringactivities
NA	96 StreetUS	2-Feb-21	15:17	7.5	-	0.06	6.05	0.03	1.79	DO meter notrecording
NA	96 StreetDS	2-Feb-21	15:34	8	-	0.07	6.07	0.03	3.84	DO meter notrecording
NA	Silda DitchUS	3-Feb-21	12:20	8.9	3.37	0.3	6.49	0.15	9.72	Baseline
NA	Silda DitchDS	3-Feb-21	11:30	7.6	4.9	0.29	6.32	0.15	11.20	Baseline
NA	96 StreetUS	3-Feb-21	2:45	6.0	0.55	0.09	6.04	0.44	2.10	Dewateringactivities
NA	96 StreetDS	3-Feb-21	3:15	5.9	0.47	0.03	6.02	0.56	2.16	Dewateringactivities
NA	96 StreetUS	3-Feb-21	4:41	5.5	0.52	0.45	5.98	0.57	1.65	Isolated ditchtie in to 96 St ditch
NA	96 StreetDS	3-Feb-21	3:45	5.3	0.59	0.34	5.90	0.78	2.35	Isolated ditchtie in to 96 Street ditch
NA	L1300 US	3-Feb-21	22:00	6.2	1.15	0.14	6.37	0.14	25.35	Upcoming ditch infilling activities baseline data stagnantwater
NA	L1300 DS	3-Feb-21	22:30	6.2	1.28	0.59	6.25	0.59	28.00	Upcoming ditch infilling activities baseline data stagnant water
NA	Cougar Crk US	4-Feb-21	11:12	8.2	1.76	0.20	5.96	0.10	1.88	Institute sampling
NA	Cougar Crk DS	4-Feb-21	11:26	8.3	0.81	0.20	5.94	0.10	1.92	Institute sampling
NA	L2100 Road sideDitch US	2021-02-08	1:00	7.4	0.12	0.30	6.30	0.18	21.0	Installing road platesand access pad
NA	L2100 Road sideDitch DS	2021-02-08	12:45	7.4	0.13	0.34	6.25	0.20	25.23	Installing road platesand access pad
NA	L2100 Road sideDitch US	2021-02-08	2:00	6.9	0.10	0.28	6.60	0.17	21.0	Installing road platesand access pad - completed
NA	L2100 Road sideDitch DS	2021-02-08	2:15	6.5	0.12	0.29	6.75	0.25	23.5	Installing road platesand accesspad - completed
NA	L2100 Road sideDitch US	2021-02-09	21:00	6.8	0.12	0.45	6.78	0.18	21.45	Installing sand accesspad for culvert installation
NA	L2100 Road sideDitch DS	2021-02-09	21:15	6.9	0.34	0.25	6.34	.23	25.10	Installing sand accesspad for culvert installation
NA	L2100 Road sideDitch US	2021-02-09	23:00	2.4	0.11	0.35	6.30	0.20	21.39	Installing sand accesspad for culvert installation
NA	L2100 Road sideDitch DS	2021-02-09	23:15	2.5	0.10	0.27	6.44	0.34	22.90	Installing sand accesspad for culvert installation
NA	Silda DitchDS	2021-02-12	10:40	4.4	NA	0.35	6.79	0.18	9.04	-
NA	Silda DitchMS	2021-02-12	10:55	3.3	NA	0.47	6.73	0.23	8.91	-
NA	Fraser River Inlet	2021-02-12	9:40	4.2	NA	1.64	6.72	0.82	1.19	-
NA	96 th StreetDS	2021-02-12	8:30	3.8	NA	0.06	6.25	0.03	2.75	-
NA	Silda DitchUS	2021-02-12	8:45	0.7	NA	0.03	4.70	0.01	2.18	-

Site Code	Site	Date	Time	Water Temp (°C)	DO (mg/L)	Conductivity (mS/cm)	pH	TDS (ppt)	Turbidity (NTU)	Comments
NA	L100 DS	2021-02-12	8:50	0.3	NA	0.98	6.21	0.52	59.8	Broke ice to get sample. No works occurring. Resampling will occur when temperatures increase.
NA	L100 US	2021-02-12	9:00	2.1	NA	1.62	6.44	0.81	79.6	Broke ice to get sample. No works occurring. Resampling will occur when temperatures increase.
NA	Cougar Creek US	2021-02-12	13:33	4.9	NA	0.25	6.94	0.12	3.79	New gravel fill was placed on the trail next to the creek
NA	Cougar Creek 10 m	2021-02-12	13:40	3.0	NA	0.25	7.26	0.13	1.92	Discharge
NA	Cougar Creek 90 m	2021-02-12	13:50	2.7	NA	0.25	7.30	0.12	1.61	New gravel fill was placed on the trail next to the creek
NA	E04 wet area discharge L2100 (Pre work baseline)	2021-02-16	20:30	2.6	-	0.56	6.23	0.19	18.9	Baseline discharge area data
NA	E04 wet area discharge L2100	2021-02-16	21:45	2.4	-	0.45	6.45	0.18	22.3	Discharge to vegetation
NA	E04 wet area discharge L2100	2021-02-17	02:00	0.5	-	0.42	6.33	0.25	24.8	Discharge to sediment bag
NA	E04 wet area discharge L2100	2021-02-17	3:30	0.3	-	0.14	6.34	0.17	23.7	Discharge to sediment bag
NA	E04 wet area discharge L2100 (Pre work baseline)	2021-02-17	20:30	5.9	-	0.91	6.25	0.37	25.5	Discharge to sediment bag - low water levels at submersible pump
NA	E04 wet area discharge L2100	2021-02-18	02:30	2.4	-	0.14	6.34	0.17	23.7	Discharge to sediment bag - low water levels at submersible pump
NA	E04 wet area discharge L2100 (Pre work baseline)	2021-02-18	21:00	3.8	-	0.23	6.67	0.22	22.8	Baseline discharge area data
NA	E04 wet area discharge L2100	2021-02-19	03:00	3.2	-	0.45	6.53	0.36	23.7	Discharge to sediment bag - low water levels at submersible pump
NA	Cougar Creek - US	2021-02-19	09:50	8.4	-	0.49	6.38	0.24	3.60	Baseline
NA	Cougar Creek - 10m	2021-02-19	10:00	7.1	-	0.49	6.46	0.24	3.49	Baseline
NA	Cougar Creek - 90m	2021-02-19	10:10	6.2	-	0.48	6.60	0.24	3.20	Baseline
NA	Fraser River Inlet	2021-02-18	9:25	6.6	-	0.46	6.43	0.23	6.0	Baseline
NA	96 St DS	2021-02-18	9:35	3.7	-	0.04	6.25	0.03	1.75	Baseline
NA	96 St US	2021-02-18	9:45	3.2	-	0.05	6.04	0.02	1.00	Baseline
NA	Silda ditch upstream	2021-02-18	10:30	3.8	-	0.79	6.73	0.40	7.9	Baseline
NA	Silda ditch downstream	2021-02-18	10:45	5.6	-	0.81	6.5	0.41	11.90	Baseline
NA	E04 wet area discharge L2100	2021-02-21	21:15	8.78	-	0.56	6.62	0.34	11.8	Discharge to sediment bag - large pool of stagnant water from weekend rainfall
NA	E04 wet area discharge L2100	2021-02-21	02:30	7.23	-	0.45	6.53	0.36	12.7	Discharge to sediment bag - large pool of stagnant water from weekend rainfall
NA	E04 wet area discharge L2100	2021-02-23	21:45	7.22	-	0.45	6.23	0.23	10.9	Discharge to sediment bag - limited dewatering due to low levels of groundwater in trench
NA	E04 wet area discharge L2100	2021-02-23	01:30	7.05	-	0.67	6.11	0.39	11.2	Discharge to sediment bag - limited dewatering due to low levels of groundwater in trench
NA	E04 wet area discharge L2100	2021-02-23	22:30	7.05	-	0.67	6.11	0.39	11.2	Discharge to sediment bag - limited dewatering due to low levels of groundwater in trench

Site Code	Site	Date	Time	Water Temp (°C)	DO (mg/L)	Conductivity (mS/cm)	pH	TDS (ppt)	Turbidity (NTU)	Comments
NA	E04 wet area discharge L2100	2021-02-24	02:45	5.25	-	0.33	7.03	0.43	10.3	Discharge to sediment bag – limited dewatering due to low levels of groundwater in trench
NA	Fraser River Inlet	2021-02-24	9:25	7.0	-	0.24	6.79	0.12	13.80	-
NA	96 StreetDS	2021-02-24	12:30	6.7	-	0.05	4.73	0.03	2.20	-
NA	96 StreetUS	2021-02-24	12:45	6.3	-	0.04	4.70	0.02	0.75	-
NA	Silda DitchUS	2021-02-24	14:10	8.9	-	0.78	6.68	0.41	12.00	-
NA	Silda DitchDS	2021-02-24	14:20	8.4	-	0.71	6.52	0.35	13.30	-
NA	L100 DS	2021-02-24	13:10	7.0	-	0.83	6.13	0.42	48.70	-
NA	L100 US	2021-02-24	13:15	7.8	-	0.82	6.15	0.45	42.30	-
NA	Cougar Creek US	2021-02-24	14:40	7.8	-	0.32	7.16	0.16	1.37	-
NA	Cougar Creek 10m	2021-02-24	14:48	7.1	-	0.32	7.12	0.16	1.24	-
NA	Cougar Creek 90m	2021-02-24	14:54	7.4	-	0.32	7.12	0.16	1.20	-
NA	E04 wet area discharge L2100	2021-02-24	20:15	5.80	-	0.10	7.13	0.13	10.9	Discharge to sediment bag – limited dewatering due to low levels of groundwater in trench
NA	E04 wet area discharge L2100	2021-02-25	02:45	5.25	-	0.27	7.01	0.3	12.2	Discharge to sediment bag – limited dewatering due to low levels of groundwater in trench
NA	Fraser River Inlet	2021-03-02	09:25	7.8	-	3.43	6.68	1.71	16.40	Low Tide -2:27 High Tide -21:02
NA	96 StreetDS	2021-03-02	12:30	7.2	-	0.06	6.11	0.03	2.83	Low Tide -2:27 High Tide -21:02
NA	96 StreetUS	2021-03-02	12:45	7.8	-	0.06	5.27	0.03	1.29	Low Tide -2:27 High Tide -21:02
NA	L100 DS	2021-03-02	13:10	7.9	-	0.95	6.15	0.48	82.0	High turbidity recorded in ditch, water stagnant. Water quality tested in 96 th St Ditch and no issues observed. ESC measures being added to ditch.
NA	L100 US	2021-03-02	13:15	8.2	-	0.95	6.23	0.49	102.3	High turbidity recorded in ditch, water stagnant. Water quality tested in 96 th St Ditch and no issues observed. ESC measures being added to ditch.
NA	Cougar Creek US	2021-03-04	14:40	8.4	-	0.29	6.40	0.15	1.52	-
NA	Cougar Creek 10 m	2021-03-04	14:48	7.9	-	0.30	6.62	0.30	1.85	-
NA	Cougar Creek 90 m	2021-03-04	14:54	7.8	-	0.30	6.69	0.15	1.90	-
NA	Silda DitchUS	2021-03-04	14:10	7.7	-	0.23	6.18	0.14	6.43	Low tide -15:56 High tide -22:57
NA	Silda DitchDS	2021-03-04	14:20	7.7	-	0.18	6.14	0.09	5.64	Low tide -15:56 High tide -22:57
NA	Fraser River Inlet	2021-03-10	10:30	7.7	-	4.00	6.81	2.00	27.70	Low tide -10:30 High tide -14:57
NA	96 StreetDS	2021-03-10	10:40	8.0	-	0.12	6.28	0.06	4.70	-
NA	96 StreetUS	2021-03-10	10:50	7.9	-	0.04	5.47	0.02	0.98	-
NA	Silda DitchUS	2021-03-10	11:45	7.8	-	0.67	6.64	0.33	12.30	Low tide -10:30 High tide -14:57
NA	Silda DitchDS	2021-03-10	11:35	7.5	-	0.67	6.73	0.33	12.30	Low tide -10:30 High tide -14:57
NA	L100 DS	2021-03-10	11:35	7.5	-	0.94	6.30	0.47	99.30	High turbidity recorded in ditch, water stagnant. Water quality tested in 96 th St Ditch and no issues observed. ESC measures being added to ditch. Sediment fence added along the side of preload.
NA	L100 US	2021-03-10	11:10	8.0	-	1.06	6.31	0.53	80.20	-

Site Code	Site	Date	Time	Water Temp (°C)	DO (mg/L)	Conductivity (mS/cm)	pH	TDS (ppt)	Turbidity (NTU)	Comments
NA	Cougar Creek US	2021-03-10	11:20	10.1	-	0.26	6.61	0.13	2.38	-
NA	Cougar Creek 10 m	2021-03-10	13:45	8.3	-	0.26	6.86	0.14	2.07	-
NA	Cougar Creek 90 m	2021-03-10	13:50	8.9	-	0.26	6.97	0.13	1.65	-
NA	L	2021-03-10	14:05	8.9	-	-	-	-	-	-
NA	M	2021-03-10	14:30	-	-	0.45	6.05	0.20	-	-
NA	N	2021-03-10	14:35	-	-	-	-	-	-	-
NA	K	2021-03-10	14:40	-	-	3.86	7.48	1.98	-	-
NA	K	2021-03-10	14:45	-	-	0.11	6.02	0.06	-	-
NA	J	2021-03-10	14:50	-	-	0.12	5.82	0.06	-	-
NA	Fraser River Inlet	2021-03-17	10:30	6.1	11.62	0.90	7.20	0.45	11.50	High tide -8:57 Low tide -16:41
NA	96 StreetDS	2021-03-17	10:45	7.2	7.15	0.11	6.20	0.05	4.78	-
NA	96 StreetUS	2021-03-17	11:05	6.7	4.88	0.03	4.50	0.02	4.51	-
NA	Silda DitchUS	2021-03-17	9:50	6.5	11.40	0.32	7.21	0.16	12.50	High tide -8:57 Low tide -16:41
NA	Silda DitchDS	2021-03-17	10:10	7.7	4.80	0.72	6.44	0.36	22.00	High tide -8:57 Low tide -16:41
NA	L100 DS	2021-03-17	11:10	6.2	3.68	0.84	6.15	0.42	72.30	Stagnant ditch. ESCmeasures have beeninstalled including sediment fence and straw wattles. Check dam in place at the inlet to 96 th ditch. Nowater qualityissues observed in 96 th ditch.
NA	L100 US	2021-03-17	11:40	6.8	4.23	0.88	6.53	0.51	103.50	Stagnant ditch. ESCmeasures have beeninstalled including sediment fence and straw wattles. Check dam in place at the inlet to 96 th ditch. Nowater quality issues observed in96 th ditch.
NA	Cougar Creek US	2021-03-17	13:45	9.3	9.36	0.30	6.89	0.15	3.19	-
NA	Cougar Creek 10 m	2021-03-17	13:50	8.8	9.71	0.28	7.05	0.14	3.68	-
NA	Cougar Creek 90 m	2021-03-17	14:05	8.8	9.68	0.28	7.04	0.14	3.70	-
NA	Fraser River Inlet	2021-03-25	9:10	6.1	11.62	0.90	7.20	0.45	11.50	Low tide -10:02 High tide -16:27
NA	96 StreetDS	2021-03-25	9:40	8.1	6.13	0.25	6.31	0.12	5.24	
NA	96 StreetUS	2021-03-25	9:55	8.1	5.37	0.06	5.08	0.03	1.39	
NA	Silda DitchUS	2021-03-25	8:40	8.4	5.64	0.33	6.38	0.17	24.50	Low tide -10:02 High tide -16:27
NA	Silda DitchDS	2021-03-25	8:50	8.9	5.83	0.28	6.78	0.14	21.30	Low tide -10:02 High tide -16:27
NA	L100 DS	2021-03-25	10:00	7.9	4.89	0.76	6.36	0.38	71.30	
NA	L100 US	2021-03-25	10:15	8.3	5.44	0.78	6.53	0.36	88.60	
NA	Cougar Creek US	2021-03-25	14:00	10.7	9.43	0.20	7.00	0.10	8.52	
NA	Cougar Creek 10 m	2021-03-25	14:10	10.4	9.35	0.20	6.84	0.10	7.66	
NA	Cougar Creek 90 m	2021-03-25	14:20	10.4	9.68	0.20	6.88	0.10	7.23	
NA	Ditch dewateringfor culvert 105 DS	30-Mar-21	9:30	8.3	5.83	0.13	6.94	0.32	322	Dewateringto the baseof preload.
NA	Ditch dewateringfor culvert 105 US	30-Mar-21	9:35	8.8	5.32	0.08	6.88	0.12	64.3	Dewateringto a storm water draineast of the ditch.

Site Code	Site	Date	Time	Water Temp (°C)	DO (mg/L)	Conductivity (mS/cm)	pH	TDS (ppt)	Turbidity (NTU)	Comments
NA	Ditch dewatering for culvert 105 DS	31-Mar-21	10:00	10.4		0.68	6.33	0.33	384	
NA	Ditch dewatering for culvert 105 US	31-Mar-21	10:25	10.3		0.45	6.27	0.24	3.10	
NA	Fraser River Inlet	31-Mar-21	10:15	9.4	10.58	0.17	7.03	0.08	30.50	
NA	96 Street DS	31-Mar-21	10:30	8.7	6.19	0.06	5.70	0.03	8.50	
NA	96 Street US	31-Mar-21	10:45	8.6	6.05	0.03	4.28	0.02	1.14	
NA	L100 DS	31-Mar-21	10:50	7.8	5.07	1.08	6.07	0.54	87.50	
NA	L100 US	31-Mar-21	11:05	8.5	5.83	1.88	6.13	0.75	103.2	
NA	Ditch dewatering for culvert 105 DS	01-April - 21	10:00	12.1	6.15	0.56	6.24	0.28	173	Dewatering to the base of preload.
NA	Ditch dewatering for Culvert 105 US	01-April - 21	10:25	10.3	6.23	0.45	6.27	0.24	116	Dewatering to a storm water drain east of the ditch
NA	Silda ditch US	1-Apr-21	9:15	7.7	4.87	0.17	6.18	0.09	5.64	High tide -7:25 Low tide -14:22
NA	Silda ditch DS	1-Apr-21	9:30	7.7	4.37	0.23	6.14	0.14	6.83	High tide -7:25 Low tide -14:22
NA	Cougar Creek - US	1-Apr-21	11:00	8.5	9.38	0.26	6.45	0.14	2.65	
NA	Cougar Creek - 10m	1-Apr-21	11:10	8.0	9.36	0.26	6.60	0.13	2.19	
NA	Cougar Creek - 90m	1-Apr-21	11:20	8.1	9.37	0.25	6.52	0.14	2.68	
NA	J - Off Site	8-Apr-21	1:00AM	7.9	4.76	0.13	5.92	0.07	4.37	
NA	K - Off Site	8-Apr-21	1:15AM	7.8	4.74	0.14	5.74	0.07	37.1	Stagnant water, no flows.
NA	L - Off Site	8-Apr-21	1:40AM	5.0	4.11	0.3	6.01	0.15	20.6	Stagnant water, no flows.
NA	M - Off Site	8-Apr-21	2:20AM	5.8	4.32	0.3	6.28	0.1	40.3	Stagnant water, no flows.
NA	N - Off Site	8-Apr-21	3:20AM	6.3	4.58	0.18	5.78	0.11	20.3	Stagnant water, no flows.
NA	K - On Site	8-Apr-21	1:20AM	7.8	9.6	4.24	7.64	2.12	3.03	Clear, transparent water
NA	O - On Site	8-Apr-21	2:35AM	5.8	6.33	0.28	7.08	0.07	16.4	Stagnant water, no flows.
NA	P - On Site	8-Apr-21	2:50AM	6.8	6.3	0.33	6.68	0.35	60.3	Turbid water with light brown color
NA	Fraser River Inlet	9-Apr-21	12:50	7.5	9.68	0.65	6.29	0.33	20.10	High tide -5:23 Low tide -11:48
NA	96 Street DS	9-Apr-21	1:05	9.0	8.44	0.07	6.01	0.03	4.43	
NA	96 Street US	9-Apr-21	1:20	8.8	6.38	0.08	6.03	0.03	2.21	
NA	Silda ditch US	9-Apr-21	1:50	8.7	7.37	0.77	6.31	0.38	28.50	High tide -5:23 Low tide -11:48
NA	Silda ditch DS	9-Apr-21	2:10	8.7	6.22	0.83	6.28	0.41	35.40	High tide -5:23 Low tide -11:48
NA	L100 DS	9-Apr-21	1:35	8.5	5.33	1.06	6.90	0.53	84.60	High tide -5:23 Low tide -11:48
NA	L100 US	9-Apr-21	1:45	8.3	4.21	3.21	6.77	0.72	82.10	High tide -5:23 Low tide -11:48
NA	Cougar Creek - US	9-Apr-21	2:45	8.7	9.74	0.36	7.93	0.16	3.84	
NA	Cougar Creek - 10m	9-Apr-21	2:55	8.6	9.92	0.36	7.88	0.16	1.97	
NA	Cougar Creek - 90m	9-Apr-21	3:05	8.6	9.86	0.36	7.88	0.16	1.60	
NA	Fraser River Inlet	15-Apr-21	14:18	11.7	9.36	0.88	7.36	0.44	67.30	High tide -7:33 Low tide -14:44
NA	96 Street DS	16-Apr-21	14:30	15.5	4.27	0.07	6.20	0.04	4.63	High tide -7:50 Low tide -15:16
NA	96 Street US	16-Apr-21	14:40	15.2	3.61	0.04	5.41	0.02	1.41	High tide -7:50 Low tide -15:16
NA	Silda ditch US	15-Apr-21	20:05	17.2	1.83	0.67	6.95	0.33	30.60	Low tide -14:44 High tide -21:49
NA	Silda ditch DS	15-Apr-21	19:50	16.2	2.02	0.71	6.34	0.35	67.30	Low tide -14:44 High tide -21:49 See second sentence in Section 4.5
NA	L100 DS	16-Apr-21	14:45	20.0	5.22	0.95	6.91	0.47	41.50	See first line in Section 4.5
NA	L100 US	16-Apr-21	14:55	21.3	6.14	1.37	6.92	0.51	71.40	See first line in Section 4.5

Site Code	Site	Date	Time	Water Temp (°C)	DO (mg/L)	Conductivity (mS/cm)	pH	TDS (ppt)	Turbidity (NTU)	Comments
NA	Cougar Creek - US	15-Apr-21	18:15	14.3	8.89	0.23	6.44	0.12	3.39	
NA	Cougar Ck - 10 m	15-Apr-21	18:25	14.0	8.28	0.24	6.60	0.12	3.46	
NA	Cougar Ck - 90 m	15-Apr-21	18:35	14.0	8.26	0.23	6.60	0.12	3.44	
NA	Fraser River Inlet	22-Apr-21	15:00	13.3	9.93	0.14	7.16	0.07	206.00	High tide -13:36 Low tide -20:16
NA	Silda ditch upstream	22-Apr-21	16:10	20.2	6.81	0.64	6.71	0.39	44.30	High tide -13:36 Low tide -20:16
NA	Silda ditchDS	22-Apr-21	16:00	20.9	7.36	0.72	6.76	0.36	57.90	High tide -13:36 Low tide - 20:16- HighNTU reading dueto Fraser River high NTU during high tide
NA	Cougar Creek - US	22-Apr-21	16:25	16.3	8.17	0.24	7.07	0.12	7.69	
NA	Cougar Creek - 10m	22-Apr-21	16:35	16.2	7.60	0.25	7.05	0.12	3.63	
NA	Cougar Creek - 90m	22-Apr-21	16:45	16.3	7.82	0.25	7.04	0.12	4.31	
NA	J - Off Site	22-Apr-21	6:30PM	18.1	2.8	0.26	5.79	0.13	14.3	Water contains orange tannins andfloating organics
NA	K - Off Site	22-Apr-21	6:40PM	18.1	3.67	0.1	6.13	0.19	16.8	Water contains orange tannins and floating organics
NA	L - Off Site	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	The area isdry therefore no sample was collected
NA	M - Off Site	22-Apr-21	7:15PM	15.3	3.71	0.34	6.51	0.18	28.3	Water contains orange tannins andfine floating organics- mostly stagnant water
NA	N - Off Site	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	The area isdry therefore no sample was collected
NA	K - On Site	22-Apr-21	6:50PM	18	5.74	5.58	7.48	2.8	5.62	Clear transparentwater
NA	O - On Site	22-Apr-21	6:55 PM	16.4	4.51	0.13	7.4	0.11	5.22	Transparent with yellow tannins
NA	P - On Site	22-Apr-21	7:30 PM	16.6	4.66	0.36	6.48	0.41	1.6	Turbid water with light brown tannins-Stagnant water- not flowing
NA	Fraser River Inlet	28-Apr-2021	14:40	10.3	10.28	0.93	7.06	0.68	29.20	Please refer to Table 5.1. Low tide moving out
NA	Silda ditchUS	28-Apr-2021	18:40	12.8	4.17	0.30	6.37	0.44	37.20	Please refer to Table 5.1. High tide moving in
NA	Silda ditchDS	28-Apr-2021	18:20	12.4	4.33	0.16	6.33	0.35	41.40	Please refer to Table 5.1. High tide moving in
NA	Cougar Creek - US	28-Apr-2021	18:55	10.8	9.76	0.22	6.93	0.18	5.13	
NA	Cougar Creek - 10m	28-Apr-2021	19:10	10.8	9.89	0.28	6.85	0.16	5.44	
NA	Cougar Creek - 90m	28-Apr-2021	19:20	10.6	9.25	0.28	6.84	0.16	3.38	
NA	L550 Ditch - US	5 May	7:49	13.5	1.88	0.34	6.50	0.44	17.5	The water has brown tannins but is mostly clear with small sized floating organics. No instream activities that will influence water quality
NA	L550 Ditch - DS	5 May	8:00	11.9	1.75	0.27	6.80	0.10	22.3	The water has brown tannins but is mostly clear with small sized floating organics. No instream activities that will influence water quality
NA	L550 Ditch - US	5 May	14:35	15.0	0.68	0.36	6.71	0.42	21.1	The water has brown tannins but is mostly clear with small sized floating organics. No instream activities that will influence water quality
NA	L2100 Ditch DS	6 May	07:30	14.7	4.18	0.80	6.50	0.40	31.2	DS baseline data- prior to road plate installation- Pre work baseline data.
NA	L2100 DS	6 May	12:00	17.0	4.18	0.77	7.19	0.39	11.2	Water has brown tannins and is transparent
NA	L2100 DS	6 May	16:30	15.2	8.92	0.76	7.28	0.38	10.9	Water has brown tannins and is transparent
NA	Silda Ditch Upper-US	6 May	11:30	14.7	1.27	0.71	6.33	0.35	32.40	Water is brown and turbid

Site Code	Site	Date	Time	Water Temp (°C)	DO (mg/L)	Conductivity (mS/cm)	pH	TDS (ppt)	Turbidity (NTU)	Comments
NA	Silda ditch US	6 May	11:45	13.6	2.68	0.73	6.58	0.37	31.20	Water is brown and turbid
NA	Silda ditch DS	6 May	11:55	13.8	7.53	0.72	7.01	0.35	20.80	Water is brownish grey and opaque
NA	Fraser River Inlet	7 May	7:16	9.1	10.81	0.13	7.73	0.06	111.00	
NA	Silda Ditch Upper-US	7 May	7:01	11.3	0.58	0.70	6.36	0.35	47.80	Water is brown and turbid
NA	Silda Ditch US	7 May	6:35	10.4	2.18	0.75	6.53	0.37	33.90	Water is brown and turbid
NA	Silda Ditch DS	7 May	6:10	8.8	10.07	0.16	7.54	0.08	74.50	Water is brownish grey and opaque. High NTU contributed to Fraser river water influx during high tide
NA	Cougar Ck – US	7 May	8:07	10.9	6.99	0.16	6.84	0.08	8.04	
NA	Cougar Ck – 10m	7 May	8:15	11.0	6.39	0.16	6.99	0.08	7.71	
NA	Cougar Ck – 90m	7 May	8:40	11.0	7.30	0.16	7.01	0.08	7.76	
NA	J – Off Site	6 May	9:35	12	2.65	0.15	6	0.08	7.97	Water contains orange tannins and floating organics
NA	K – Off Site	6 May	9:45	11.9	1.09	0.21	5.98	0.1	3.61	Water contains orange tannins and floating organics
NA	L – Off Site	6 May	10:05	11.2	2.83	0.86	6.63	0.43	13	Water is slightly grey with fine floating organics. Water was stagnant during monitoring
NA	M – Off Site	6 May	10:15	10.3	1.35	0.21	6.04	0.1	17.4	Water contains orange tannins and fine floating organics
NA	N – Off Site	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	The area is dry therefore no sample was collected
NA	K – On Site	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	The area is dry therefore no sample was collected
NA	O – On Site	6 May	10:00	12.5	2.91	0.2	6.32	0.1	4.21	Transparent with yellow tannins
NA	P – On Site	6 May	10:30	11.6	1.03	0.42	6.68	0.53	20.8	Turbid water with light brown tannins. Water was stagnant during monitoring
NA	Fraser River Inlet	13-May-21	17:40	17.2	9.10	0.25	7.00	0.13	67.80	Water is Brown/ grey and turbid
NA	Silda ditch Upper-US	13-May-21	15:40	16.5	8.94	0.78	6.46	0.39	68.2	Water is brown and turbid – Slow-flowing almost stagnant
NA	Silda ditch US	13-May-21	16:50	15.4	10.20	1.01	6.76	0.50	55.00	Water is brown and turbid
NA	Silda ditch DS	13-May-21	16:15	17.4	9.53	0.74	7.09	0.38	45.1	Water is brown and turbid
NA	Fraser River Inlet	18-May-21	17:35	14.6	8.60	0.29	5.78	0.14	68.80	Water is grey and turbid
NA	Silda Ditch Upper-US	18-May-21	18:40	16.7	9.10	0.70	6.60	0.35	69.70	Water is brown and opaque, stagnant
NA	Silda Ditch US	18-May-21	18:20	16.0	9.54	0.78	6.43	0.39	44.80	Water is brown and opaque
NA	Silda Ditch DS	18-May-21	18:10	17.4	7.30	0.62	6.77	0.31	29.70	Water is brown and opaque
NA	Nordel Ditches –east of Nordel Way	26-May-21	09:58	-	-	-	-	-	31.7	Additional monitoring done to determine high NTU readings in Silda ditch Upstream- Not associated with construction activities
NA	Silda ditch US	26-May-21	10:03	-	-	-	-	-	61.6	Additional monitoring done to determine high NTU readings in Silda ditch Upstream- Large pond area at the culvert inlet. Mostly stagnant water.
NA	Nordel weigh bridge ditches	26-May-21	10:10	-	-	-	-	-	17.7	Additional monitoring done to determine high NTU readings in Silda ditch Upstream. Stagnant water
NA	Nordel Ditch Tributary (Planet Ice)	26-May-21	10:36	-	-	-	-	-	29.1	Additional monitoring done to determine high NTU readings in Silda ditch Upstream. Mostly slow flowing water with high occurrences of ferrous oxide residue.
NA	Fraser River Inlet	28-May-21	12:30	17.3	10.42	0.88	7.15	0.56	108.00	Water is grey and turbid
NA	Silda ditch Upper-US	28-May-21	13:25	20.5	7.88	0.45	6.20	0.22	92.90	Water is brownish grey and turbid

Site Code	Site	Date	Time	Water Temp (°C)	DO (mg/L)	Conductivity (mS/cm)	pH	TDS (ppt)	Turbidity (NTU)	Comments
NA	Silda ditch US	28-May-21	13:15	22.0	4.74	0.53	6.21	0.27	102.00	Water is brownish grey and turbid
NA	Silda ditch DS	28-May-21	13:00	20.2	7.34	0.42	6.03	0.21	92.90	Water is brownish grey and turbid
NA	Fraser River Inlet	3-Jun-21	14:45	15.2	9.49	0.10	6.49	0.05	60.20	Water was turbid & gray in color and opaque
NA	Silda ditch US	3-Jun-21	16:30	24.1	5.33	0.45	6.21	0.22	74.80	Water was turbid and brown in color & opaque
NA	Silda ditch MS	3-Jun-21	16:10	27.5	7.64	1.00	6.46	0.50	53.70	Water was turbid and brown in color & opaque
NA	Silda ditch DS	3-Jun-21	15:20	18.2	6.31	0.36	6.37	0.18	25.10	Water was turbid and brown in color & opaque
NA	Silda Ditch 1	3-Jun-21	16:50	26.0	8.43	0.40	6.54	0.20	30.4	Water was turbid and brown in color & opaque.
NA	Silda Ditch 3	3-Jun-21	17:10	23.9	3.62	0.53	6.23	0.27	29.7	Water was turbid and brown in color & opaque.
NA	Silda Ditch 2	3-Jun-21	17:20	25.0	3.11	0.30	6.88	0.15	37.1	Water was turbid and brown in color & opaque.
NA	Silda Ditch 4	3-Jun-21	17:40	22.2	2.81	0.29	6.35	0.14	18.6	Water was turbid and brown in color & opaque.
NA	J off-site	3-Jun-21	7:45 PM	19.3	1.08	0.19	6.08	0.1	52.8	Water was turbid due to water collection; many organics were put into suspension resulting in a high turbidity reading
NA	K off-site	3-Jun-21	8:05 PM	20.5	1.44	0.35	6	0.17	6.35	Water was transparent with brown tannins
NA	K on-site	3-Jun-21	n/a	n/a	n/a	n/a	n/a	n/a	n/a	Dry
NA	L off-site	3-Jun-21	8:15 PM	21.5	2.86	0.1	5.53	0.05	5.78	Water was transparent with brown tannins
NA	M off-site	3-Jun-21	n/a	n/a	n/a	n/a	n/a	n/a	n/a	Dry
NA	N off-site	3-Jun-21	n/a	n/a	n/a	n/a	n/a	n/a	n/a	Dry
NA	P on-site	3-Jun-21	8:45 PM	20.4	3.3	1.28	6.19	0.64	18.6	Water was turbid due to water collection; many organics were put into suspension resulting in a high turbidity reading
NA	O on-site	3-Jun-21	8:20 PM	21	3.18	0.2	6.04	0.1	5.44	Water was transparent with brown tannins
NA	Fraser River Inlet	11-Jun-21	12:20	15.7	10.21	0.13	5.66	0.06	79.65	Water was turbid and gray in color and opaque
NA	Silda ditch US	11-Jun-21	13:10	17.3	7.22	0.54	6.52	0.27	128.00	Water was turbid and brown in color and opaque
NA	Silda ditch MS	11-Jun-21	12:54	17.3	8.83	0.54	6.57	0.27	124.00	Water was turbid and brown in color and opaque
NA	Silda ditch DS	11-Jun-21	12:40	16.8	8.65	0.52	6.35	0.26	58.60	Water was turbid and brown in color and opaque
NA	Fraser River Inlet	16-Jun-21	20:32	15.8	10.74	0.13	7.01	0.07	46.20	Water was turbid and gray in color and opaque
NA	Silda ditch US	16-Jun-21	20:10	18.0	4.31	0.27	6.47	0.13	12.90	Water was transparent and brown colored with tannins
NA	Silda ditch MS	16-Jun-21	19:50	19.7	4.47	0.38	6.71	0.19	17.10	Water was transparent and brown colored with tannins
NA	Silda ditch DS	16-Jun-21	19:35	22.2	5.82	0.36	6.66	0.17	12.20	Water was transparent and brown colored with tannins
NA	Silda Ditch 1	16-Jun-21	21:10	17.1	4.20	0.28	6.23	0.14	14.00	Water was transparent and brown colored with tannins
NA	J off-site	17-Jun-21	8:45 PM	19.3	1.08	0.19	6.08	0.1	52.8	Water was turbid due to water collection; many organics were put into suspension resulting in a high turbidity reading
NA	K off-site	17-Jun-21	8:00 PM	n/a	n/a	n/a	n/a	n/a	n/a	Dry
NA	K on-site	17-Jun-21	7:45 PM	n/a	n/a	n/a	n/a	n/a	n/a	Dry
NA	L off-site	17-Jun-21	9:15 PM	20.6	5.33	1	6.11	0.5	5.15	Water was transparent with brown tannins

Site Code	Site	Date	Time	Water Temp (°C)	DO (mg/L)	Conductivity (mS/cm)	pH	TDS (ppt)	Turbidity (NTU)	Comments
NA	L on-site	17-Jun-21	9:10 PM	22.6	5.84	0.82	7.25	0.41	1.23	
NA	M off-site	17-Jun-21	n/a	n/a	n/a	n/a	n/a	n/a	n/a	Dry
NA	N off-site	17-Jun-21	n/a	n/a	n/a	n/a	n/a	n/a	n/a	Dry
NA	P on-site	17-Jun-21	9:00 PM	20.8	4.86	1.61	5.79	0.81	7.46	Water was transparent with brown tannins
NA	O on-site	17-Jun-21	8:20 PM	21	5.42	0.91	6.41	0.1	6.61	Water was transparent with brown tannins
NA	Fraser River Inlet	24-Jun-21	19:00	17.2	9.44	0.12	7.02	0.06	60.6	Water was turbid and gray in color and opaque
NA	Silda ditch DS	24-Jun-21	19:15	21.3	5.44	0.33	6.88	0.15	34.2	Water was transparent and brown colored with tannins
NA	Silda ditch MS	24-Jun-21	19:25	19.8	4.82	0.38	6.51	0.19	14.8	Water was transparent and brown colored with tannins
NA	Silda ditch US	24-Jun-21	19:35	19.0	4.46	0.33	6.48	0.15	12.3	Water was transparent and brown colored with tannins
NA	Silda ditch 1 (off-site)	24-Jun-21	19:50	18.5	4.44	0.30	6.42	0.15	12.1	Water was transparent and brown colored with tannins
NA	Silda ditch downstream	30-Jun-21	10:50	18.4	10.12	0.10	6.99	0.05	28.5	
NA	Silda ditch midstream	30-Jun-21	11:15	21.8	4.71	0.67	6.98	0.33	32.8	
NA	Silda ditch upstream	30-Jun-21	12:50	24.2	2.78	0.69	6.22	0.39	30.7	
NA	Silda ditch 1	30-Jun-21	13:30	28.8	5.53	0.66	6.51	0.33	58.9	
NA	Fraser River Inlet	30-Jun-21	11:35	22.5	9.27	0.10	7.77	0.05	43.3	High Tide
NA	J off-site	30-Jun-21	3:55 PM	26.2	6.00	0.10	5.04	0.06	6.73	
NA	K off-site	30-Jun-21	n/a	n/a	n/a	n/a	n/a	n/a	n/a	Dry
NA	K on-site	30-Jun-21	n/a	n/a	n/a	n/a	n/a	n/a	n/a	Dry
NA	L off-site	30-Jun-21	3:20 PM	27.00	5.92	0.11	5.03	0.06	7.81	
NA	L on-site	30-Jun-21	n/a	n/a	n/a	n/a	n/a	n/a	n/a	Dry
NA	M off-site	30-Jun-21	n/a	n/a	n/a	n/a	n/a	n/a	n/a	Dry
NA	N off-site	30-Jun-21	n/a	n/a	n/a	n/a	n/a	n/a	n/a	Dry
NA	P on-site	30-Jun-21	3:40 PM	26.4	4.48	1.06	6.05	0.60	5.04	
NA	O on-site	30-Jun-21	3:30 PM	27.2	5.90	0.20	5.54	0.10	9.14	

*Tidal Chart data collected from: <https://www.tides.gc.ca/eng/station?sid=7654>

03 June 2021			11 June 2021			16 June 2021			23 June 2021			30 June 2021		
Time	Height		Time	Height		Time	Height		Time	Height		Time	Height	
PDT	(m)	(ft)	PDT	(m)	(ft)	PDT	(m)	(ft)	PDT	(m)	(ft)	PDT	(m)	(ft)
01:26	3.0	9.8	00:59	1.9	6.2	04:19	2.3	7.5	00:23	2.5	8.2	00:13	3.1	10.2
08:05	2.2	7.2	06:05	2.7	8.9	07:59	2.6	8.5	05:09	3.2	10.5	06:40	2.1	6.9
10:45	2.2	7.2	13:58	1.1	3.6	16:44	1.0	3.3	14:10	1.1	3.6	10:51	2.4	7.9
19:24	0.8	2.6	20:10	2.8	9.2	23:57	3.0	9.8	20:20	3.2	10.5	18:22	1.2	3.9

APPENDIX 8: TOOLBOX TRAINING RECORDS

Daily Toolbox Talk

Weather

Tue Evening	Tue Overnight	Wed Morning	Wed Afternoon
Mainly sunny	Partly cloudy	A mix of sun and clouds	Mainly sunny
			
15°	10°	12°	17°

Daily Notices/ Alerts

SPILL TRAYS

The use of spill trays is mandatory on the project. All equipment parked for greater than 2 hours must have a spill tray placed under the engine. Any fuel stored on site must be placed in secondary containment. Please check to ensure that spill trays are clean, fully functional and not damaged when placed under equipment. If your crew need additional spill trays, please inform the Environmental team.

- All inactive equipment (parked for >2 hours) should have a spill tray placed under the engine part when not in use.
- Please report any damaged and/or missing spill trays.
- Ensure spill trays are clean. If any residue is observed on the surface of the spill tray, it should be wiped off with an absorbent pad.
- All used absorbent pads must be brought to the PGC site office and placed into the black drum that is labelled *Used Spill Pads*.
- All light plants and pumps should have spill trays placed under them.
- Please monitor spill trays during rain events and ensure that spill trays are emptied if they fill with water and the water is observed to be clean.

For the storage and refueling of equipment on site:

- A spill tray must always be used.
- The storage of fuel jerrycans on site must be done inside a spill tray to ensure that they are in secondary containment.

When spill trays are not in use, they should be placed upside down to prevent rainwater from accumulating in them.

Daily Toolbox Talk

o protect the health and safety of yourself and your co-workers and to reduce the spread of COVID-19 on the project, all personnel must answer the following questions.

In the past 14 days; have you:	YES	NO
Experienced a fever, cough, difficulty breathing or cold and flu-like symptoms?		<input checked="" type="checkbox"/>
Been in close contact with a person with COVID-19 (probable or confirmed) or who has symptoms compatible with COVID-19 (fever, cough, difficulty breathing)?		<input checked="" type="checkbox"/>
Travelled outside the country?		<input checked="" type="checkbox"/>
Been in close contact with a person who recently travelled outside the country?		<input checked="" type="checkbox"/>
Been contacted by a health authority regarding close contact with a confirmed case?		<input checked="" type="checkbox"/>

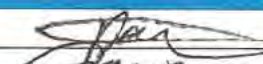
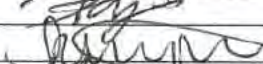

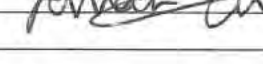

If anyone answered YES to any of the questions above, please isolate and contact site Health and Safety immediately

All workers fit for duty?

☒ YES

☐ NO

Toolbox Sign On

#	Print Name	Signature
1	Paige Cunningham	
2	Fallan Einarson	
3	Kimberly Prasad	
4	Riley Johnson	
5	Janah Einarson	
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Additional Notes

Daily Toolbox Talk

To protect the health and safety of yourself and your co-workers and to reduce the spread of COVID-19 on the project, all personnel must answer the following questions.

In the past 14 days; have you:	YES	NO
Experienced a fever, cough, difficulty breathing or cold and flu-like symptoms?		<input checked="" type="checkbox"/>
Been in close contact with a person with COVID-19 (probable or confirmed) or who has symptoms compatible with COVID-19 (fever, cough, difficulty breathing)?		<input checked="" type="checkbox"/>
Travelled outside the country?		<input checked="" type="checkbox"/>
Been in close contact with a person who recently travelled outside the country?		<input checked="" type="checkbox"/>
Been contacted by a health authority regarding close contact with a confirmed case?		<input checked="" type="checkbox"/>

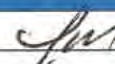
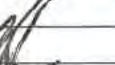
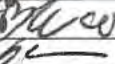

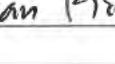

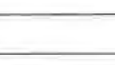
If anyone answered YES to any of the questions above, please isolate and contact site Health and Safety immediately

All workers fit for duty?

☒ YES

☐ NO

Toolbox Sign On

#	Print Name	Signature
1	JACK MCKENNA	
2	KEVIN DRAKE	
3	BRAD WARREN	
4	KEVIN EUGEN	
5	KYLE O'HARA	
6	CALVIN DOUGLAS	
7	Ryan Fianzi	
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Additional Notes

Daily Toolbox Talk- OFFICE

Date: June 9
HSE Initials: KC

Crew: Office

Shift (circle): **Day** / Night

Project Name: Highway 91/17 Upgrade

Supervisor: Adam Person

Project #: 6218101

Foreman: _____

First aid attendant	<u>Lucas</u>	Muster Points	Parking Lot
Work location	<u>8100B Nordel Way</u>	Emergency number	<u>911</u>

To protect the health and safety of yourself and your co-workers and to reduce the spread of COVID-19 on the project, all personnel must answer the following questions.

In the past 14 days; have you:	YES	NO
Experienced a fever, cough, difficulty breathing or cold and flu-like symptoms?		<input checked="" type="checkbox"/>
Been in close contact with a person with COVID-19 (probable or confirmed) or who has symptoms compatible with COVID-19 (fever, cough, difficulty breathing)?		<input checked="" type="checkbox"/>
Travelled outside the country?		<input checked="" type="checkbox"/>
Been in close contact with a person who recently travelled outside the country?		<input checked="" type="checkbox"/>
Been contacted by a health authority regarding close contact with a confirmed case?		<input checked="" type="checkbox"/>

If anyone answered YES to any of the questions above, please isolate and contact site Health and Safety immediately

All workers fit for duty?	<input checked="" type="radio"/> YES	<input type="radio"/> NO
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Toolbox Sign On		
#	Print Name	Signature
1	<u>Kent Chin</u>	<u>KC</u>
2	<u>Samuel Hsieh</u>	<u>Samuel Hsieh</u>
3	<u>Bill Brown</u>	<u>Bill Brown</u>
4	<u>Adam Person</u>	<u>Adam Person</u>
5	<u>Lucas Hallett</u>	<u>Lucas Hallett</u>
6	<u>Lucas Wiggins</u>	<u>Lucas Wiggins</u>
7	<u>NATALIA DEVEBS</u>	<u>Natalia Deves</u>
8	<u>DALE MAEDOVA LD</u>	<u>W S B C</u>
9	<u>SUKI SINGH</u>	<u>W S B C</u>
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Daily Toolbox Talk

To protect the health and safety of yourself and your co-workers and to reduce the spread of COVID-19 on the project, all personnel must answer the following questions.

In the past 14 days; have you:	YES	NO
Experienced a fever, cough, difficulty breathing or cold and flu-like symptoms?		<input checked="" type="checkbox"/>
Been in close contact with a person with COVID-19 (probable or confirmed) or who has symptoms compatible with COVID-19 (fever, cough, difficulty breathing)?		<input checked="" type="checkbox"/>
Travelled outside the country?		<input checked="" type="checkbox"/>
Been in close contact with a person who recently travelled outside the country?		<input checked="" type="checkbox"/>
Been contacted by a health authority regarding close contact with a confirmed case?		<input checked="" type="checkbox"/>

If anyone answered YES to any of the questions above, please isolate and contact site Health and Safety immediately

All workers fit for duty?

☒ YES

☐ NO

Toolbox Sign On

#	Print Name	Signature
1	CHAS THOMPSON	
2	Thomas Clayton	
3	Gary Adams	
4	Liz Bradley	
5	Adam Pearson	
6	Sam Mackenzie	
7	Jeremy Jones	
8	Shaun Marshall	
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Additional Notes

Daily Toolbox Talk

To protect the health and safety of yourself and your co-workers and to reduce the spread of COVID-19 on the project, all personnel must answer the following questions.

In the past 14 days; have you:	YES	NO
Experienced a fever, cough, difficulty breathing or cold and flu-like symptoms?		<input checked="" type="checkbox"/>
Been in close contact with a person with COVID-19 (probable or confirmed) or who has symptoms compatible with COVID-19 (fever, cough, difficulty breathing)?		<input checked="" type="checkbox"/>
Travelled outside the country?		<input checked="" type="checkbox"/>
Been in close contact with a person who recently travelled outside the country?		<input checked="" type="checkbox"/>
Been contacted by a health authority regarding close contact with a confirmed case?		<input checked="" type="checkbox"/>

If anyone answered YES to any of the questions above, please isolate and contact site Health and Safety immediately

All workers fit for duty?

☒ YES

☐ NO

Toolbox Sign On

#	Print Name	Signature
1	Jerald Mel	
2	Chris L	
3	Jake J	
4	Izzah K	
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Additional Notes

Daily Toolbox Talk

To protect the health and safety of yourself and your co-workers and to reduce the spread of COVID-19 on the project, all personnel must answer the following questions.

In the past 14 days; have you:	YES	NO
Experienced a fever, cough, difficulty breathing or cold and flu-like symptoms?		X
Been in close contact with a person with COVID-19 (probable or confirmed) or who has symptoms compatible with COVID-19 (fever, cough, difficulty breathing)?		X
Travelled outside the country?		X
Been in close contact with a person who recently travelled outside the country?		X
Been contacted by a health authority regarding close contact with a confirmed case?		X

If anyone answered YES to any of the questions above, please isolate and contact site Health and Safety immediately

All workers fit for duty?	YES	NO

Toolbox Sign On		
#	Print Name	Signature
1	<i>[Signature]</i>	<i>[Signature]</i>
2	Liz Bradley	<i>[Signature]</i>
3	Jacqueline Schiestl	<i>[Signature]</i>
4	Liz Bradley	<i>[Signature]</i>
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Additional Notes

Daily Toolbox Talk

Weather

Tue Evening	Tue Overnight	Wed Morning	Wed Afternoon
A few showers	Mainly clear	A mix of sun and clouds	A mix of sun and clouds
			
6°	2°	4°	8°

Daily Notices/ Alerts

Birds and Bats

Birds:

- The breeding season for birds on this site is March 15 – August 15
- **No moving/removing nests or eggs. Contact the Environmental team if a nest or eggs are found**
- The Migratory Bird Convention Act protects migrating birds, their nests, eggs and habitat from destruction
- **REPORT ANY BIRDS STARTING A NEST BEFORE** they lay eggs (Bird nests cannot be disturbed after eggs have been laid and a 30m no entry buffer zone will be created to protect the nest)
- Some examples of birds at risk that you may encounter on this site could include Great blue herons, Falcons, Swans and Common Nighthawks

Bats:

- Active Bat Season is from April 15th to October 1st
- Species at Risk Bats are specially protected, and a buffer is required around a potential maternity roost.
- Half the bat species in BC are considered **species at risk** (vulnerable or threatened of becoming extirpated). With their important role in controlling nocturnal insect populations and cycling nutrients from wetlands to forests, bats are a critical part of our ecosystems.

Takeaways:

- Talk to your Superintendent and the Environmental Department prior to cutting any trees or vegetation
- Take extra precautions when working around trees
- Report any sightings or nesting activity
- If you see birds "hanging around" your work area or you see any nests/nesting activity in your work area, report it to Environment Department.
- Report any bird/bat sightings



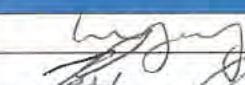
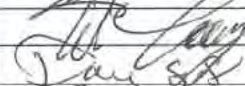

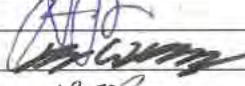
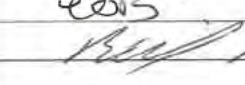
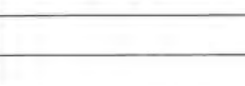
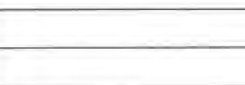
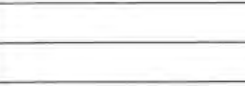
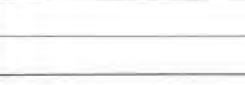
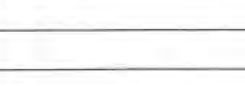
Daily Toolbox Talk

To protect the health and safety of yourself and your co-workers and to reduce the spread of COVID-19 on the project, all personnel must answer the following questions.

In the past 14 days; have you:	YES	NO
Experienced a fever, cough, difficulty breathing or cold and flu-like symptoms?		✓
Been in close contact with a person with COVID-19 (probable or confirmed) or who has symptoms compatible with COVID-19 (fever, cough, difficulty breathing)?		✓
Travelled outside the country?		✓
Been in close contact with a person who recently travelled outside the country?		✓
Been contacted by a health authority regarding close contact with a confirmed case?		✓

If anyone answered YES to any of the questions above, please isolate and contact site Health and Safety immediately

All workers fit for duty?	YES	NO
	<input checked="" type="radio"/>	<input type="radio"/>

Toolbox Sign On		
#	Print Name	Signature
1	Eric Yang	
2	Chris Chase	
3	William Hamer	
4	Dave Jean-Louis	
5	Jerome Butler	
6	Brandon Lindgren	
7	Adam Person	
8	Yi Wang	
9	Ciaran O'Brien	
10	Bill Beswick	
11	Mike Schmitt	
12	Isaac	
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Additional Notes

Daily Toolbox Talk

To protect the health and safety of yourself and your co-workers and to reduce the spread of COVID-19 on the project, all personnel must answer the following questions.

In the past 14 days; have you:	YES	NO
Experienced a fever, cough, difficulty breathing or cold and flu-like symptoms?		<input checked="" type="checkbox"/>
Been in close contact with a person with COVID-19 (probable or confirmed) or who has symptoms compatible with COVID-19 (fever, cough, difficulty breathing)?		<input checked="" type="checkbox"/>
Travelled outside the country?		<input checked="" type="checkbox"/>
Been in close contact with a person who recently travelled outside the country?		<input checked="" type="checkbox"/>
Been contacted by a health authority regarding close contact with a confirmed case?		<input checked="" type="checkbox"/>

If anyone answered YES to any of the questions above, please isolate and contact site Health and Safety immediately

All workers fit for duty?

☒ YES

☐ NO

Toolbox Sign On

#	Print Name	Signature
1	Chris Thompson	
2	Quince Adams	
3	Jacqueline Schuster	
4	Shawn Mackay	
5	Saman Abney	
6	Lizi Bradley	
7	Nicole Kelly	
8	Thomas Chapp	
9	Scott Hildy	
10	Amel Perce	
11	Jared Schneider	
12	Jeremy Spence	
13	Shawn Cole	
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Additional Notes

Daily Toolbox Talk- OFFICE

Date: June 16
HSE Initials: KC

Crew: Office

Shift (circle): **Day** / Night

Project Name: Highway 91/17 Upgrade

Supervisor: Adam Person

Project #: 6218101

Foreman: _____

First aid attendant Lucas Wiggins

Muster Points Parking Lot

Work location 8100B Nordel Way

Emergency number 911

To protect the health and safety of yourself and your co-workers and to reduce the spread of COVID-19 on the project, all personnel must answer the following questions.

In the past 14 days; have you:	YES	NO
Experienced a fever, cough, difficulty breathing or cold and flu-like symptoms?		✓
Been in close contact with a person with COVID-19 (probable or confirmed) or who has symptoms compatible with COVID-19 (fever, cough, difficulty breathing)?		✓
Travelled outside the country?		✓
Been in close contact with a person who recently travelled outside the country?		✓
Been contacted by a health authority regarding close contact with a confirmed case?		✓

If anyone answered YES to any of the questions above, please isolate and contact site Health and Safety immediately

All workers fit for duty? ☒ YES ☐ NO

Toolbox Sign On		
#	Print Name	Signature
1	Kent Chiu	KC
2	Joe Shestak	
3	Adam Person	
4	Lucas Wiggins	
5	Samuel Hsieh	
6	Bill Brown	
7	Kenny Panto	
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Daily Toolbox Talk

To protect the health and safety of yourself and your co-workers and to reduce the spread of COVID-19 on the project, all personnel must answer the following questions.

In the past 14 days; have you:	YES	NO
Experienced a fever, cough, difficulty breathing or cold and flu-like symptoms?		<input checked="" type="checkbox"/>
Been in close contact with a person with COVID-19 (probable or confirmed) or who has symptoms compatible with COVID-19 (fever, cough, difficulty breathing)?		<input checked="" type="checkbox"/>
Travelled outside the country?		<input checked="" type="checkbox"/>
Been in close contact with a person who recently travelled outside the country?		<input checked="" type="checkbox"/>
Been contacted by a health authority regarding close contact with a confirmed case?		<input checked="" type="checkbox"/>

If anyone answered YES to any of the questions above, please isolate and contact site Health and Safety immediately

All workers fit for duty?	<input checked="" type="radio"/> YES	<input type="radio"/> NO
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Toolbox Sign On		
#	Print Name	Signature
1	Kimberly Pateal	
2	Jannah Einarson	
3	Fallon Einarson	
4	Paige Cunningham	
5	Riley Johnson	
6	Shelko Harder	
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Additional Notes

Daily Toolbox Talk

To protect the health and safety of yourself and your co-workers and to reduce the spread of COVID-19 on the project, all personnel must answer the following questions.

In the past 14 days; have you:	YES	NO
Experienced a fever, cough, difficulty breathing or cold and flu-like symptoms?		✓
Been in close contact with a person with COVID-19 (probable or confirmed) or who has symptoms compatible with COVID-19 (fever, cough, difficulty breathing)?		✓
Travelled outside the country?		✓
Been in close contact with a person who recently travelled outside the country?		✓
Been contacted by a health authority regarding close contact with a confirmed case?		✓

If anyone answered YES to any of the questions above, please isolate and contact site Health and Safety immediately

All workers fit for duty?

☒ YES

☐ NO

Toolbox Sign On

#	Print Name	Signature
1	Will Lawton	
2	James Heathman	
3	Sam Ko	
4	Josh demps	
5	cal demps	
6		
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Additional Notes

Daily Toolbox Talk

to protect the health and safety of yourself and your co-workers and to reduce the spread of COVID-19 on the project, all personnel must answer the following questions.

In the past 14 days; have you:

	YES	NO
Experienced a fever, cough, difficulty breathing or cold and flu-like symptoms?		<input checked="" type="checkbox"/>
Been in close contact with a person with COVID-19 (probable or confirmed) or who has symptoms compatible with COVID-19 (fever, cough, difficulty breathing)?		<input checked="" type="checkbox"/>
Travelled outside the country?		<input checked="" type="checkbox"/>
Been in close contact with a person who recently travelled outside the country?		<input checked="" type="checkbox"/>
Been contacted by a health authority regarding close contact with a confirmed case?		<input checked="" type="checkbox"/>

If anyone answered YES to any of the questions above, please isolate and contact site Health and Safety immediately

All workers fit for duty?

☒ YES

☐ NO

Toolbox Sign On

#	Print Name	Signature
1	Paige Cunningham	
2	Kimberly Prasad	
3	Jannah Einarson	
4	Kaitlyn Einarson	
5	Jericho Harder	
6	Rylee Johnson	
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Additional Notes

Daily Toolbox Talk

Weather

Tue Evening	Tue Overnight	Wed Morning	Wed Afternoon
A few showers	Mainly clear	A mix of sun and clouds	A mix of sun and clouds
			
6°	2°	4°	8°

Daily Notices/ Alerts

Birds and Bats

Birds:

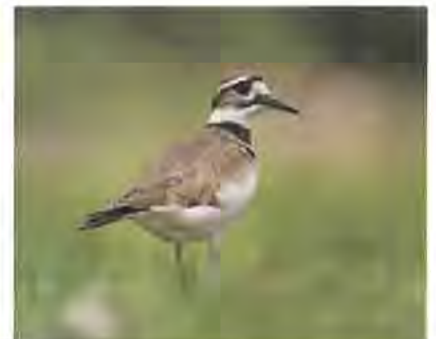
- The breeding season for birds on this site is March 15 – August 15
- **No moving/removing nests or eggs. Contact the Environmental team if a nest or eggs are found**
- The Migratory Bird Convention Act protects migrating birds, their nests, eggs and habitat from destruction
- **REPORT ANY BIRDS STARTING A NEST BEFORE** they lay eggs (Bird nests cannot be disturbed after eggs have been laid and a 30m no entry buffer zone will be created to protect the nest)
- Some examples of birds at risk that you may encounter on this site could include Great blue herons, Falcons, Swans and Common Nighthawks

Bats:

- Active Bat Season is from April 15th to October 1st
- Species at Risk Bats are specially protected, and a buffer is required around a potential maternity roost.
- Half the bat species in BC are considered **species at risk** (vulnerable or threatened of becoming extirpated). With their important role in controlling nocturnal insect populations and cycling nutrients from wetlands to forests, bats are a critical part of our ecosystems.

Takeaways:

- Talk to your Superintendent and the Environmental Department prior to cutting any trees or vegetation
- Take extra precautions when working around trees
- Report any sightings or nesting activity
- If you see birds "hanging around" your work area or you see any nests/nesting activity in your work area, report it to Environment Department.
- Report any bird/bat sightings



Daily Toolbox Talk

Weather

Tue Afternoon Sunny	Tue Evening Sunny	Tue Overnight Clear	Wed Morning Mostly sunny	Wed Afternoon A mix of sun and clouds
				
26°	24°	15°	17°	21°
30	27	15	17	23

Daily Notices/ Alerts

Dust Control & Air Quality

Dust can become airborne due to numerous activities on site including earthworks, material stockpiling and equipment operations. Dust is a concern for sensitive habitats (such as Burns Bog), wildlife health, as well as human health in nearby residential and commercial areas.

The following measures must be implemented on site:

- Speed limits on unpaved surfaces (less than 15 km/h) are always to be followed to reduce fugitive dust emissions.
- In areas where dust fallout is visibly high, the watering of access routes must be done with a water truck/trailer.
- Regular road sweeping must be done during and after each shift.

Dust fallout created by construction activities does not only have an environmental impact but can also cause illness (silicosis) in humans.

Visibility is affected by dust fall-out originating from site, which can be a risk to road users & members of the public.

To protect the health and safety of yourself and your co-workers and to reduce the spread of COVID-19 on the project, all personnel must answer the following questions.

In the past 14 days; have you:	YES	NO
Experienced a fever, cough, difficulty breathing or cold and flu-like symptoms?		<input checked="" type="checkbox"/>
Been in close contact with a person with COVID-19 (probable or confirmed) or who has symptoms compatible with COVID-19 (fever, cough, difficulty breathing)?		<input checked="" type="checkbox"/>
Travelled outside the country?		<input checked="" type="checkbox"/>
Been in close contact with a person who recently travelled outside the country?		<input checked="" type="checkbox"/>
Been contacted by a health authority regarding close contact with a confirmed case?		<input checked="" type="checkbox"/>

If anyone answered YES to any of the questions above, please isolate and contact site Health and Safety immediately

All workers fit for duty?	YES	NO
	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Daily Toolbox Talk

Toolbox Sign On		
#	Print Name	Signature
1	Lucas Cope	Small Man
2	James Hodgson	
3	Kan Cing	
4	Will Lawson	
5	Chad Kirby	
6	OFERUSON	
7	William Hamer	
8	RANDALL CARLSON	
9	Dave Jean-Louis	
10	Jerome Butler	
11	Sam Ke	
12	Carl Demps	
13	Josh Demps	
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Additional Notes

Daily Toolbox Talk

Toolbox Sign On		
#	Print Name	Signature
1	CHRIS THOMPSON	
2	DAVID BROOKS	
3	Jeremy Jones	
4	Thomas Clughr	
5	Salam Abdul	
6	Ajmal Peroo	
7	Hester Sonoma	
8	Joyce Adams	
9	Shawn Marshak	
10	Nigel Leary	
11	Grace O'Brien	
12	Jamie Kano	
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Additional Notes

Daily Toolbox Talk- OFFICE

Date: June 23

HSE Initials: MC

Crew: Office

Shift (circle): **Day** / Night

Project Name: Highway 91/17 Upgrade

Supervisor: Adam Person

Project #: 6218101

Foreman: _____

First aid attendant	<u>Lucas</u>	Muster Points	Parking Lot
Work location	<u>8100B Nordel Way</u>	Emergency number	<u>911</u>

To protect the health and safety of yourself and your co-workers and to reduce the spread of COVID-19 on the project, all personnel must answer the following questions.

In the past 14 days; have you:	YES	NO
Experienced a fever, cough, difficulty breathing or cold and flu-like symptoms?		<input checked="" type="checkbox"/>
Been in close contact with a person with COVID-19 (probable or confirmed) or who has symptoms compatible with COVID-19 (fever, cough, difficulty breathing)?		<input checked="" type="checkbox"/>
Travelled outside the country?		<input checked="" type="checkbox"/>
Been in close contact with a person who recently travelled outside the country?		<input checked="" type="checkbox"/>
Been contacted by a health authority regarding close contact with a confirmed case?		<input checked="" type="checkbox"/>







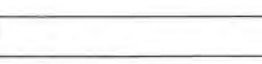
If anyone answered YES to any of the questions above, please isolate and contact site Health and Safety immediately

All workers fit for duty?	<input checked="" type="radio"/> YES	<input type="radio"/> NO
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Toolbox Sign On		
#	Print Name	Signature
1	<u>Kate O'Hare</u>	
2	<u>JOE SHEARER</u>	<u>JS</u>
3	<u>Kent Chiu</u>	<u>MC</u>
4	<u>Kenny Ponto</u>	<u>KPonto</u>
5	<u>Samuel Hsieh</u>	<u>Samuel Hsieh</u>
6	<u>Bill Benoit</u>	<u>BB</u>
7	<u>Matt Tessari</u>	<u>MT</u>
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Daily Toolbox Talk



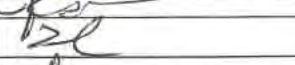

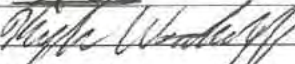
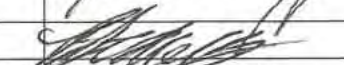




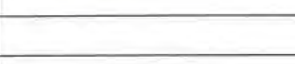



Toolbox Sign On

#	Print Name	Signature
1	Arden Aghazadeh	
2	Fallon Einarson	
3	Kimberly Prasad	
4	Janah Einarson	
5	Biley Johnson	
6	Valge Cunningham	
7	Jessika Harder	
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Additional Notes

Daily Toolbox Talk


Toolbox Sign On

#	Print Name	Signature
1	Alexander S. Sosa	
2	Shawn Holborn	
3	Joyce Adams	
4	SEAN CALLES	
5	KEL REDDICK	
6	Shawn Holborn	
7	Kyle Woodruff	
8		
9	Brady Ludwig	
10	Mervin	
11	Nick Lussu	
12	Jimmy Huckle	
13	Bill Benavente	
14	CRISTO O. S.	
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21	Jim McMillan	
22	Ryan Kirby	
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Additional Notes

Daily Toolbox Talk

Toolbox Sign On

#	Print Name	Signature
1	Joyce Adams	
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Additional Notes

Daily Toolbox Talk

Weather

Tue Afternoon Sunny	Tue Evening Sunny	Tue Overnight Clear	Wed Morning Sunny	Wed Afternoon Sunny
				
31°	26°	19°	20°	25°
37	32	20	21	30

Daily Notices/ Alerts

Drips are Spills

Did you know?

A drip must be reported to the environmental group because a drip is a spill.

Drips and spills are reported to:

- Werner Beukes (250) 407-2776
- Andre Felicio (604) 313-9581
- Joey Chiasson (778) 222-9489

The same cleanup measures are used for a drip as for a spill:

- Remove contaminated soil and gravel using the contaminated bags located in the yellow spill kit bins.
- Dispose of contaminated soil and absorbent materials in the PGC waste management area.

Drip Causes

- Worn fittings, gaskets, hoses; Overfilling fluid reservoirs and fuel tanks; Failure to place drip tray under stationary equipment or during refueling procedure.

Preventing Drips

- Pre-Site Access Inspections – all equipment arriving to site is to be inspected for signs of drips and leaks.
- Regularly scheduled maintenance.
- Drip trays are to be placed under all stationary equipment.

Light Duty Vehicles

A few reminders for LDV operation:

- Place the reflective bands on the passenger side mirror when parked. If you don't have one, you can grab one from the table at the entrance of the main office trailer.
- Complete a 360 walkaround of your LDV before taking off.
- Do not make a U-turn at an intersection – turn your vehicle around at a safe location even if it takes a little longer.

Daily Toolbox Talk

To protect the health and safety of yourself and your co-workers and to reduce the spread of COVID-19 on the project, all personnel must answer the following questions.

In the past 14 days; have you:	YES	NO
Experienced a fever, cough, difficulty breathing or cold and flu-like symptoms?		<u> </u>
Been in close contact with a person with COVID-19 (probable or confirmed) or who has symptoms compatible with COVID-19 (fever, cough, difficulty breathing)?		<u> </u>
Travelled outside the country?		<u> </u>
Been in close contact with a person who recently travelled outside the country?		<u> </u>
Been contacted by a health authority regarding close contact with a confirmed case?		<u> </u>

If anyone answered YES to any of the questions above, please isolate and contact site Health and Safety immediately

All workers fit for duty?	<u>YES</u>	NO
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Toolbox Sign On		
#	Print Name	Signature
1	Jamal Mah	
2	Izzah Kelly	
3	Chris Lantieri	
4	Sam Ko	
5	Carl Demp	
6	Josh Demp	
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Additional Notes

Daily Toolbox Talk

To protect the health and safety of yourself and your co-workers and to reduce the spread of COVID-19 on the project, all personnel must answer the following questions.

In the past 14 days; have you:	YES	NO
Experienced a fever, cough, difficulty breathing or cold and flu-like symptoms?		<u> </u>
Been in close contact with a person with COVID-19 (probable or confirmed) or who has symptoms compatible with COVID-19 (fever, cough, difficulty breathing)?		<u> </u>
Travelled outside the country?		<u> </u>
Been in close contact with a person who recently travelled outside the country?		<u> </u>
Been contacted by a health authority regarding close contact with a confirmed case?		<u> </u>

If anyone answered YES to any of the questions above, please isolate and contact site Health and Safety immediately

All workers fit for duty?

YES

NO

Toolbox Sign On		
#	Print Name	Signature
1	Jamal Mah	
2	Izzah Kelly	
3	Chris Lantieri	
4	Sam Ko	
5	Carl Demp	
6	Josh Demp	
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Additional Notes

Daily Toolbox Talk- OFFICE

Date: June 30
HSE Initials: KL

Crew: Office

Shift (circle): **Day** / Night

Project Name: Highway 91/17 Upgrade

Supervisor: Adam Person

Project #: 6218101

Foreman: _____

First aid attendant	<u>Lucas Wiggins</u>	Muster Points	Parking Lot
Work location	<u>8100B Nordel Way</u>	Emergency number	<u>911</u>

To protect the health and safety of yourself and your co-workers and to reduce the spread of COVID-19 on the project, all personnel must answer the following questions.

In the past 14 days; have you:	YES	NO
Experienced a fever, cough, difficulty breathing or cold and flu-like symptoms?		✓
Been in close contact with a person with COVID-19 (probable or confirmed) or who has symptoms compatible with COVID-19 (fever, cough, difficulty breathing)?		✓
Travelled outside the country?		✓
Been in close contact with a person who recently travelled outside the country?		✓
Been contacted by a health authority regarding close contact with a confirmed case?		✓

If anyone answered YES to any of the questions above, please isolate and contact site Health and Safety immediately

All workers fit for duty?	<input checked="" type="radio"/> YES	<input type="radio"/> NO
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Toolbox Sign On		
#	Print Name	Signature
1	<u>Kent Chiu</u>	<u>KL</u>
2	<u>Sam Mackenzie</u>	<u>KL</u>
3	<u>Kenny Ponto</u>	<u>KL</u>
4	<u>Samuel Hsieh</u>	<u>KL</u>
5	<u>Bill Bennett</u>	<u>KL</u>
6	<u>Lucas Wiggins</u>	<u>KL</u>
7	<u>Adam Person</u>	<u>KL</u>
8	<u>Tony Xiang</u>	<u>KL</u>
9	<u>Joe Smeaton</u>	<u>KL</u>
10	<u>Muwin Ahmed Alif</u>	<u>KL</u>
11	<u>Rick Berg</u>	<u>KL</u>
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Daily Toolbox Talk

To protect the health and safety of yourself and your co-workers and to reduce the spread of COVID-19 on the project, all personnel must answer the following questions.

In the past 14 days; have you:	YES	NO
Experienced a fever, cough, difficulty breathing or cold and flu-like symptoms?		
Been in close contact with a person with COVID-19 (probable or confirmed) or who has symptoms compatible with COVID-19 (fever, cough, difficulty breathing)?		
Travelled outside the country?		
Been in close contact with a person who recently travelled outside the country?		
Been contacted by a health authority regarding close contact with a confirmed case?		

If anyone answered YES to any of the questions above, please isolate and contact site Health and Safety immediately

All workers fit for duty?	YES	NO
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Toolbox Sign On		
#	Print Name	Signature
1	William Lamey	
2	SEAN LAWLESS	
3	Brandon Lindgren	
4	Kyle Woodcock	
5		
6	Shawn Halbert	
7	Red Roseberry	
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Additional Notes

APPENDIX 9: INCIDENT REPORTS (*Including Spills larger than 5L*)



Ministry of
Transportation
and Infrastructure



Pacific
Gateway
Constructors

Ministry of Transportation and Infrastructure
Highway 91/17 Upgrade Project

Health and Safety Management
Environmental Incident Report

Environmental Incident Report

General:

Project Name:	Highway 91/17 Upgrade Project		
Contractor:	Pacific Gateway Constructors		
Incident Location:	S4 Southern side of L2200 Loop		
Internal Incident no.	034	Client incident no:	
Incident date:	22 June 2021	Incident time:	4:00am approximately
Reported by:	Ciaran O'Brien	Reported to:	Werner Beukes
Supervisor:	Roy Fair	Witnesses:	N/A
Report date:	22 June 2021	Report Prepared By:	Joey Chiasson

Incident Description:

Detailed Description (Who, What, Where, When, Why, How):

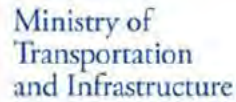
At approximately 4:00am a spill occurred when a haul truck experienced a mechanical failure while hauling stones to the drilling site. The spill released approximately 5L of hydraulic fluid to the asphalt and the adjacent sand embankment. Upon further investigation the spill did not appear to affect any nearby waterways as the spill was contained to the immediate area. This spill went unreported by the haul truck operator. PGC identified the spill at approximately 8:30 and responded immediately to the incident and initiated the spill response. The contaminated soil was excavated by hand with shovels and placed into plastic hazardous waste bags before being stored temporarily in a contaminated soil waste bin. Absorbent material was used to clean the fluid from the asphalt, placed in hazardous waste bags and stored into a contaminated spill pad waste bin. The soil will be sent off-site for disposal to an appropriate off-site facility on June 24th.

Incident Types:

<input type="checkbox"/> Encroachment of Environmentally Sensitive Area	<input type="checkbox"/> Adverse Impacts to Fish/Wildlife	<input type="checkbox"/> Water Quality/Quantity
<input type="checkbox"/> Hazardous Materials Management	<input type="checkbox"/> Disturbance to archaeological / heritage site	<input type="checkbox"/> Air Quality
<input checked="" type="checkbox"/> Spills	<input type="checkbox"/> Unauthorized discharge	<input type="checkbox"/> Unauthorized clearing
<input type="checkbox"/> Waste Management	<input type="checkbox"/> Other:	

For Spills:

Quantity Released:	Approximately 5L	Quantity Contained: 100%
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Health and Safety Management Environmental Incident Report

A hydraulic line from the Menard sub-contractor hauling truck ruptured while leaving the drop-off site.



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PGC Supervisor:	Roy Fair	Notified immediately:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
PGC Construction Manager:	Bill Beswick	Notified immediately:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
PGC Environmental Representative:	Werner Beukes	Notified immediately:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
MOTI Designate (if required):	Jordan Jeffares	Notified:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Environmental Authority (if required):		Notified:	<input type="checkbox"/> Yes <input type="checkbox"/> No
Immediate Actions Taken:			
Description			
<p>The contaminated soil was excavated by hand with shovels and placed into plastic hazardous waste bags before being stored into a contaminated soil waste bin. Absorbent material was used to clean the fluid from the asphalt, placed in Haz waste bags and stored into a contaminated soil waste bin. The soil will be sent off-site for disposal to an appropriate off-site facility on June 24th.</p>			
Follow up Actions:			
Actions taken to prevent recurrence			
<p>PGC is requesting that all of Menard's field crews and supervisors go through our safety orientation again. PGC has requested the Menard HSE manager to investigate the incident and report back to PGC.</p>			
Key Learnings:			
Describe the key lessons identified from the incident:			
<p>Better supervision is required when sub- contractors are working during night shifts. All sub-contractor incidents and spills must be reported to PGC immediately to initiate site cleanups after they happen</p>			



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Signature
(On Behalf of Environmental Manager):

Photos:



Photo 1: PGC Spill Response



Photo 2: Asphalt staining residue remained
after completion of the spill-cleanup



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