
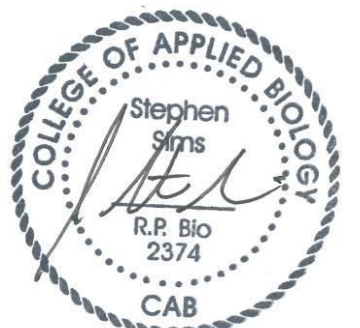


Upper Lillooet Hydro Project

Weekly Environmental Monitoring Report #106

Reporting Period: October 23 – November 5, 2016

Upper Lillooet River Hydroelectric Facility (Water File No. 2002561, Water Licence No. C130613), Boulder Creek Hydroelectric Facility (Water File No. 2003049, Water Licence No. C129969) & Transmission Line (TX Line)

Distribution List		Prepared By	
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			Date Prepared: February 22, 2017 Date Submitted: August 14, 2017

Owner Construction Permits and Approvals

Environmental Assessment Certificate No. E13-01 (Amendment 1, 2, 3, 4, 5, 6, 7)
 Fisheries Act Subsection 35(2)(b) Authorization No. 09-HPAC-PA2-000303 (Amendment 1, 2)
 Letter of Advice for the Transmission Line No. 09-HPAC0-PA2-000303
 Leave To Commence Construction (ULRHEF) File No. 2002561
 Leave To Commence Construction (BDRHEF) File No. 2002453
 Leave To Commence Construction (TX Line) File No. 2002561/2002453
 Conditional Water Licence (ULRHEF C130613) File No. 2002561
 Conditional Water Licence (BDRHEF C129969) File No. 2002453
 Conditional Water Licence (BDRHEF C131153) File No. 2003601
 Licence of Occupation & Modification Agreement (ULRHEF #232384) File No. 2409871
 Licence of Occupation (BDRHEF #232386) File No. 2409998
 Licence of Occupation (TX Line #2423386) File No. 2410654
 Occupant Licence to Cut (ULRHEF) No. L49717 (Amendments 1, 2, 3, 4, 5, 6, 7)
 Occupant Licence to Cut (BDRHEF – KM 38 laydown) No. L49698
 Occupant Licence to Cut (BDRHEF) No. L49816 (Amendments 1, 2, 3)
 Occupant Licence to Cut (TX Line) No. L49697 (Amendments 1, 2, 3, 4, 5, 6, 7, 8, 9)
 General Wildlife Measure Exemption Approval Letter (TX Line & BDRHEF) File No. 78700-35/06 UWR and 39585-20 WHA
 Heritage Conservation Act – Alteration Permit (ULRHEF) File No. 11200-03/2014-0033
 Road Use Permit No. 6123-13-02 (Lillooet River FSR); 5673-13-01 (Rutherford Creek FSR); 7977-13-01 (Lillooet South FSR); 8015-13-01 (Ryan River); 8188-13-01 (Pemberton Creek FSR); and 9717-13-01 (Miller Bench FSR)
 Junction Permit (ULRHEF & BDRHEF) File No. 11250-32/6123 (Amendment 1)
 Aeronautical Obstruction Approval (Tx Line - Lillooet River Crossing) File No. 2013-004
 Aeronautical Obstruction Approval (Tx Line - Ryan River) File No. 2013-005
 Aeronautical Obstruction Approval (Tx Line - North Miller) File No. 2013-006
 Aeronautical Obstruction Approval (Tx Line - South Miller) File No. 2013-007
 Aeronautical Obstruction Approval (Tx Line - Pemberton Creek) File No. 2013-008
 Aeronautical Obstruction Approval (Tx Line - Lillooet River near Pemberton) File No. 2013-009
 Aeronautical Obstruction Approval (Tx Line - Lillooet River near Meager Creek) File No. 2013-010
 Navigable Water Protection Act (ULRHEF) File No. 8200-2009-500434-001
 Navigable Water Protection Act (BDRHEF) File No. 8200-2012-501-032-001
 Navigable Water Protection Act (Tx Line – North Creek) File No. 8200-2013-500103-001
 Navigable Water Protection Act (Tx Line – Lillooet River) File No. 8200-2013-500101-001
 Navigable Water Protection Act (Tx Line – Lillooet River) File No. 8200-2013-500102-01
 Navigable Water Protection Act (Tx Line – Ryan River) File No. 8200-2013-500104-001
 Navigable Water Protection Act (Tx Line – South Miller River) File No. 8200-2013-500100-001
 Navigable Water Protection Act (Tx Line – Boulder Creek) File No. 8200-2013-500099-001
 Navigable Water Protection Act – Extension Approval (ULRHEF, BDRHEF, Tx Line)
 Navigable Water Protection Act (Bridge – Ryan River) File No. 8200-2013-500381
 Navigable Water Protection Act (Bridge – Upper Lillooet Side Channel; Extension Approval) File No. 8200-2013-500383
 Section 57 Authorization (ULRHEF) File No. 16660-20/REC202717
 SLRD Temporary Use Permit No. 34 – Boulder Creek HEF
 SLRD Temporary Use Permit No. 35 – Upper Lillooet River HEF
 SLRD Building Permit (10864) – Upper Lillooet River HEF Powerhouse
 SLRD Building Permit (10865) – Boulder Creek HEF Powerhouse
 Works Permit for Construction within FSR Right-of-Way No. 6123-14-01
 Works Permit for Construction within FSR Right-of-Way No. 7977-15-01
 Section 52(1)(b) FRPA Authorization for Ryan River Wet Crossing File No. FOR-19400-01/2014
 MOTI Permit to Construct, Use and Maintain Works Upon the Right-Of-Way of a Provincial Public Highway No. 2014-06099
 Magazine Licence File No. UL76018 (Renewal 1)
 Section 8 Approval – Short Term Use of Water File (Lillooet River and Tributaries) No. A2006123 (Amendment 1)
 Section 8 - Special Use Permit issued for the operation of an avalanche weather station on Crown land (File No. S25988)

Contractor Construction Permits and Approvals

Waste Discharge under the Code of Practice for the Concrete and Concrete Products Industry under the Environmental Management Act (Authorization No. 107204) Tracking No. 349424 (Renewal 2)

Wildlife Act Permits – Pacific Tailed Frog Salvage Permit # SU15-164805; Fish Salvage Permit # SU15-174722

Fisheries and Oceans Canada – Anadromous Fish Salvage Permit #XR 178 2015

BC Safety Authority – Temporary Construction Electrical Service Permit EL-140698-2014

Municipal Wastewater Regulation - Authorization # 107032

Water Supply System Construction Permits – VCH-14-613 for Main Camp

Water Supply System Permit to Operate Issued July 30th, 2014 for Main Camp

Section 6(3) and Schedule 3 Wildfire Regulations Fire Exemption for Ryan River Bridge File No. 14350-07

SLRD Building Inspection Report dated August 13, 2014 - Construction Camp Building Permit No. 10830

Lillooet River FSR Temporary Road Closures Approval File No. 11250-32/6123 (Amendment 1, 2)

Lillooet South FSR Temporary Road Closures Approval File No. 11250-32/7977

SLRD Building Permits for Mechanic Shop (10862) and Carpentry Shop (10836) March 18, 2015

SLRD Building Permit Stages 1 - 4 – Boulder Powerhouse Architectural, Electrical and Mechanical (10865) October 8, 2015

SLRD Building Permit Stages 1 - 4 – Upper Lillooet Powerhouse Architectural and Mechanical (10864) October 6, 2015

Water Sustainability Act Section 10(1) Use Approval dated March 24, 2016

Section 7 Explosives Act – Magazine Licence (U76018) Renewal April 30, 2016

ACRONYMS:

AMBNS	Active Migratory Bird Nesting Survey	HWM	High water mark
Andritz	Andritz Hydro Canada Inc.	IE	Independent Engineer (True North Energy)
ANFO	Ammonia nitrate fuel oil (industrial explosive)	IEM	Independent Environmental Monitor
ARD M/L	Acid Rock Drainage and Metal Leaching	INX	Innergex Renewable Energy Inc.
BCEAO	British Columbia Environmental Assessment Office	ISW	Instream Works
BCCOS	British Columbia Conservation Officer Service	ITM	Environmental Issue Tracking Matrix
BCWQG	British Columbia Water Quality Guidelines	JEM	JEM Energy Ltd. (Delegate Independent Engineer)
BDRHEF	Boulder Creek Hydroelectric Facility	LTC	Leave to Construct
BEBO	ULRHEF Intake Concrete Arch & Foundation Wall	MFLNRO	Ministry of Forests, Lands and Natural Resource Operations
BG	Background	MOE	Ministry of Environment
BKL	BKL Consultants Ltd.	MOTI	Ministry of Transportation and Infrastructure
CE	CRT-ebc Construction Inc.	OGMA	Old Growth Management Area
CEMP	Construction Environmental Management Plan	OLTC	Occupational License to Cut
CTF	Coastal Tailed Frog	PAG	Potentially Acid Generating
DFO	Fisheries and Oceans Canada	QP	Qualified Professional
DS	Downstream	ROW	Right of Way
EPP	Environmental Protection Plan	RVMA	Riparian Vegetation Management Area
EAC	Environmental Assessment Certificate	SES	Sartori Environmental Services
EAO	Environmental Assessment Office	SLRD	Squamish-Lillooet Regional District
Ecofish	Ecofish Research Ltd.	TX Line	Transmission Line
Ecologic	Ecologic Consulting	ULRHEF	Upper Lillooet Hydroelectric Facility
EIR	Environmental Incident Report	UWR	Ungulate Winter Range
ESC	Erosion and Sediment Control	VC	Valued Component
FAM	Field Advice Memorandum	WEL	Westpark Electric Ltd.
FSR	Forest Service Road	WEMR	Weekly Environmental Monitoring Report
Golder	Golder Associates	WHA	Wildlife Habitat Area
GWR	Mountain Goat Winter Range		
Hedberg	Hedberg and Associates Ltd.		

1.0 Summary of Site Inspections for Reporting Period

The table presented below summarizes the IEM team site presence, weather and monitoring locations by component:

Date	IEM Team Personnel	Key Monitoring Locations & Activities
October 23 – 29, 2016	SE, MC, TH	<p>Construction Camp, Laydown Areas and the Lillooet River FSR</p> <ul style="list-style-type: none"> • Road maintenance on the Lillooet River FSR • KM43 CTF stream culvert repairs <p>ULRHEF Intake & Upstream Tunnel Portal</p> <ul style="list-style-type: none"> • BEBO tunnel arch installation, concrete pours, pump removal, and backfill • Excavation and contouring of slope above right bank of Obermeyer channel • Shotcrete on the diversion wall upstream of Obermeyer <p>ULRHEF Downstream Tunnel Portal</p> <ul style="list-style-type: none"> • Plug concrete form stripping and installation of flushing pipe • Backfilling and planting of the mountain goat corridor at Truckwash Creek • Soil sampling at the KM44.7 laydown <p>ULRHEF Penstock</p> <ul style="list-style-type: none"> • Installation and backfill near the lower tunnel portal • Welding and coating works <p>ULRHEF Powerhouse</p> <ul style="list-style-type: none"> • Andritz mechanical and electrical works • Superstructure deficiency corrections • Chain link fence installation around the switchyard <p>BDRHEF Intake & Upstream Tunnel Portal</p> <ul style="list-style-type: none"> • Rock hammering and excavation for conduit and pull box installation and concrete pour of the conduit • Ditch work from KM4.25 – 5.2 on Boulder intake access road • Rebar, formwork, and concrete works for the final access road cross-ditch • Pulling rope and cables through buried conduit <p>BDRHEF Downstream Tunnel Portal</p> <ul style="list-style-type: none"> • Final tunnel lining and rock support (including shotcrete) <p>BDRHEF Powerhouse</p> <ul style="list-style-type: none"> • Manifold installation • Andritz electrical work <p>TX-Line</p> <p>Segment 8</p> <ul style="list-style-type: none"> • Burning debris piles • Slashing re-sprouting vegetation <p>Segment 13</p> <ul style="list-style-type: none"> • Burning debris piles <p>Segment 14</p> <ul style="list-style-type: none"> • Stringing, tensioning and clipping lines <p>Segment 15</p> <ul style="list-style-type: none"> • Slashing re-sprouting vegetation • Hazard tree falling <p>Segment 16</p> <ul style="list-style-type: none"> • Stringing, tensioning and clipping lines • Burning debris piles
October 30 – November 5, 2016	SE, AS	<p>Construction Camp, Laydown Areas and the Lillooet River FSR</p> <ul style="list-style-type: none"> • Road maintenance on the Lillooet River FSR • ASTR-03 prep for riprap placement

		<p>ULRHEF Intake & Upstream Tunnel Portal</p> <ul style="list-style-type: none"> • BEBO tunnel tie-in, backfill, and grouting • Excavation and contouring of slope above right bank of Obermeyer channel • Shotcrete works on the diversion wall upstream of Obermeyer • Pump demob in tunnel and final shotcrete application • Century plumbing for Obermeyer • Upstream active water treatment system removal <p>ULRHEF Downstream Tunnel Portal</p> <ul style="list-style-type: none"> • Finishing installation of flushing pipe; flow capacity test • Tunnel pump demob, flushing the tunnel, and testing the rock trap flushing pipe to Truckwash Creek • Removal of downstream tunnel active water treatment system • Maintenance of ditches and ESC measures on access road <p>ULRHEF Penstock</p> <ul style="list-style-type: none"> • Pipe installation and backfill • Welding and coating works <p>ULRHEF Powerhouse</p> <ul style="list-style-type: none"> • Andritz mechanical and electrical works • Superstructure deficiency corrections • Westpark switchyard works • EDS second stage concrete works <p>BDRHEF Intake & Upstream Tunnel Portal</p> <ul style="list-style-type: none"> • Cross-ditch rebar, formwork, and concrete pour • Ross Morrison Electric pulling rope and cables • Ditching and lock block installation • Coanda grouting <p>BDRHEF Downstream Tunnel Portal</p> <ul style="list-style-type: none"> • Final lining and rock support (including shotcrete) • Rock trap excavation, support, rebar, and formwork <p>BDRHEF Powerhouse</p> <ul style="list-style-type: none"> • Manifold installation, rebar, formwork, and concrete • Andritz electrical work • Service bay slab concrete pour <p>TX-Line</p> <p>Segment 8</p> <ul style="list-style-type: none"> • Burning slash piles <p>Segment 9</p> <ul style="list-style-type: none"> • Stringing lines <p>Segment 13</p> <ul style="list-style-type: none"> • Burning slash piles • Stringing, tensioning and clipping lines <p>Segment 14</p> <ul style="list-style-type: none"> • Pulling ropes • Stringing, tensioning and clipping lines <p>Segment 15</p> <ul style="list-style-type: none"> • Hazard tree falling • Stringing, tensioning and clipping lines <p>Segment 16</p> <ul style="list-style-type: none"> • Pulling ropes • Stringing, tensioning and clipping lines • Burning slash piles
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IEM Team Personnel: TH – Tom Hicks; SE – Stephanie Ellis; MC – Mike Champion; AS – Anne Sutherland

2.0 Administrative Summary

Key communications and meetings the IEM team had with the licensees, contractors and/or environmental authorities:

Date	Communication Type	Participants	Issues Discussed	ITM ID No.
October 25	<i>Email</i>	CE, SES, INX	CE provided INX and the IEM with the second revision of their site wide contaminated soils testing protocol for review.	-
October 26	<i>Email</i>	SES, CE, INX	RE: October 25, 2016 – Discharge of high pH water directly to the Lillooet River – The IEM observed untreated concrete waste water, with elevated pH, being pumped directly to the Lillooet River from the BEBO works area. CE had moved the concrete pour forward a day without notifying either CE’s environmental management team or the IEM. Thus, the discharge locations of the pumps were not examined prior to the commencement of the pour, which allowed water with elevated pH to be discharged directly to the Lillooet River. Once the issue was observed CE quickly redirected the water to the active water treatment system. Water quality, at the compliance point, was within BCWQGs. However, the IEM stressed that it is CE’s responsibility to ensure the IEM is notified of all sensitive works, or of construction activities that have the potential to impact water quality.	-
	<i>Email</i>	SES, CE, INX	RE: Update ITM list and summary of erosion concerns during yesterday’s rain event – The IEM provided CE and INX with the updated ITM lists in advance of the environmental coordination meeting. The IEM also identified concerns with gully erosion at KM43 of the Lillooet River FSR (ULR # 62) and turbid road run-off entering the CTF bearing watercourse between KM43 – 43.5.	ULR # 62
	<i>Email</i>	INX, CE, SES	RE: 2016-10-26 – Letter – ULHP (INE-CRTEBC-069) Increase of Environmental non-compliances – INX provided CE with a letter addressing the increased number of environmental non-compliance events observed in the month of October. Specifically, the letter outlined six non-compliance events where water with a pH exceeding BCWQGs was discharged off site: <ol style="list-style-type: none"> 1) October 7, 2016: High pH and sediment laden water discharge to Boulder Creek (BDR Intake PH unverified but justified); 2) October 9, 2016: Notification of high pH water discharged to Lillooet River (ULR Obermeyer PH>10); 3) October 11, 2016: Water with elevated pH discharged from BDRHEF powerhouse (BDR tailrace PH>10); 4) October 18, 2016: Obermeyer and Stormtec Water Management Issues (Obermeyer PH>9.1 in puddles highlighted as potential); 5) October 21, 2016: Notification of elevated pH water discharging from Boulder Intake Water Treatment System (BDR intake PH>10.96); 	-

Date	Communication Type	Participants	Issues Discussed	ITM ID No.
			<p>6) October 25, 2016: Discharge of high pH water directly to the Lillooet River (Bebo PH>9.5) INX also expressed concern that all six of these incidents were identified by the IEM and not CE's staff. INX stressed that these incidents were all preventable, and requested that CE provide additional training to crews to prevent reoccurrences of these incidents.</p>	
October 26 & November 2	<i>Email</i>	CE, SES, INX	<p>RE: ULHP Contaminated Soils Remediation and Sampling Results – CE provided preliminary results and recommendations from their QP based on soil samples taken on October 20, 2016. Results from soil sampling confirmed that all samples from KM49 (former garage and Laydown), KM45 (Hydrovac truck dump site), and KM38 Crusher pad soil met the standards for Urban Park, and inherently Wildlands and require no remediation. Samples taken from KM44.7 (Former Garage and Laydown) all met the soil standards for Urban Park, and inherently Wildlands, except for a portion in quadrant 2. Resampling of quadrant 2 that occurred on October 27, showed that these soils met the standards and could be buried 3 meter below ground level. CE was instructed bury these soils a minimum of 3m deep and to cap the buried material with clean soil.</p>	-
October 28	<i>Email</i>	CE, SES, INX	<p>RE: Oct 27 Meeting Minutes – CE provided INX and the IEM with the meeting minutes from the biweekly environmental coordination meeting held on October 27, 2016.</p>	-
October 29	<i>Email</i>	SES, CE, INX	<p>RE: Works occurring in proximity to water without proper notification to the IEM – While conducting a routine site inspection, the IEM observed CE crews working within 30m of a watercourse without notifying the IEM at two separate locations:</p> <ol style="list-style-type: none"> 1) Shotcrete application in the Obermeyer diversion channel – The IEM observed a crane transporting bags of shotcrete over the Lillooet River to the diversion channel, where crews were preparing to shotcrete the right bank of the diversion channel wall. The IEM was not notified of these works in the daily update email, site meetings, or over the radio. The IEM noted that the diversion channel was dry during inspection and that there was low risk of connectivity to the Lillooet River. However, the IEM also observed that the ponds above the Obermeyer structure contained water exceeding BCWQGs for pH and that no mitigation measures were in place to treat this or any high pH water generated from shotcrete operations. 2) Punctured culvert at the CTF bearing KM43 stream – The IEM observed that the culvert at KM43 had been punctured (the cause is unknown), and notified CE's environmental team. The IEM provided CE with recommendations to temporarily protect the culvert and to prevent sediment from entering the creek, but advised CE that permeant repairs could not occur until a CTF salvage was complete. Later that afternoon, the IEM observed CE crews completing works on the culvert. The IEM 	-

Date	Communication Type	Participants	Issues Discussed	ITM ID No.
			<p>was not notified of the works in person, via email, or on the radio, nor were any photos of the repair works taken by CE crews. Crews had installed a metal plate on top of the culvert to protect it until permeant works could be completed, and the IEM stated that there was low risk of sediment being deposited in the watercourse. However, the IEM stressed that CE had the responsibility to notify the IEM of all construction activities that would occur within 30m of a watercourse, and that the IEM must be present prior to these works occurring.</p>	
October 30 - 31	<i>Email</i>	SES, CE, INX	<p>RE: Flushing Pipe & Tunnel Water Discharge Test – CE completed the first stage of flushing the ULRHEF tunnel. Crews turned off all pumps allowing seepage water to flow towards the rock trap at the bottom of the tunnel, flushing residual sediment from the tunnel floor. Once water arrived in the rock trap the IEM tested for compliance with BCWQG (pH and turbidity). If the water exceeded for either turbidity or pH it was pumped to the downstream tunnel active water treatment system. CE directed all tunnel water to the active water treatment system during nightshift to ensure that water exceeding BCWQGs was not discharged to Truckwash Creek. Because a small portion of the upstream tunnel required shotcrete, the IEM requested that CE provide a mitigation plan to ensure high pH water would not be discharged off site.</p> <p>CE committed to the following mitigation measures:</p> <ol style="list-style-type: none"> 1) A “green box” (CO₂ injection box) was installed in the rock trap, and a manual bubbler would be added to increase treatment capacity if needed. 2) Shotcrete operation: CE used dry shotcrete allowing equipment to be placed on a dry surface further away from the wet work area, and a tarp was placed below the wall and berm was constructed to control rebound shotcrete and prevent water contact. 3) Penstock tie-in occurred after all shotcrete activities were complete allowing crews to use the Truckwash water treatment system, in addition to the “green box.” <p>On October 31, CE informed the IEM that the green box (portable CO₂ treatment system) was not functioning and that an additional bubbler was installed in the rock trap.</p>	-
October 31	<i>Email</i>	MFLNRO, INX, IE	<p>RE: Upper Lillooet River Hydro Projects – Fall 2016 Mountain Goat Monitoring Program – The IEM notified MFLNRO, INX, and the IE that mountain goat monitoring would commence on November 1, 2016. The IEM indicated that they would not be installing noise meters in the fall of 2016 as no blasting activities, (except for avalanche blasting) or “loud” construction activities were planned for the fall/winter. Note: All avalanche blasting must be completed in accordance with the IEM approved mitigation plan, which prescribes maximum blasting charge weights per avalanche path.</p>	-

Date	Communication Type	Participants	Issues Discussed	ITM ID No.
November 4	Email	CE, SES, INX	CE informed crews that daylight saving would occur on November 5, causing the daily mountain goat closure to begin an hour earlier.	
	Email	CE, SES, INX	CE formally submitted their QP's (Ecofish) memo outlining the specific mitigation measures that would be implemented to protect migrating mountain goats during the fall of 2016 and the spring of 2017.	-

3.0 Current Work Restrictions and Timing Windows

The table presented below outlines work restrictions applicable during the reporting period for each active Project component location:

Component	Location	Wildlife/Archeology Concern	Construction/Timing Restrictions & Mitigations
All Project Areas	ULRHEF intake & tailrace, BDRHEF tailrace, and fish accessible tributaries of the Lillooet River	Reduced Risk Project Specific Instream work windows for the protection of Bull Trout, Cutthroat Trout and Pacific Salmon (Coho, Sockeye), during sensitive life stages	All instream work must be conducted within Project specific timing windows. They are as follows: ULRHEF intake: August 1 – October 31 ULRHEF and BDRHEF powerhouses: July 15 – September 15
Lillooet River FSR, ULRHEF, & BDRHEF intake	Access roads above the lower limit of the 200m buffer to the Truckwash Creek Migration Corridor to the ULRHEF intake, as well as a portion of BDRHEF intake access road and intake structure within UWR u-2-002 UL 12	Mountain Goat UWRs & Migration Corridor	The IEM was onsite to oversee daily construction equipment shutdowns (November 1 - 30) beginning one hour before and two hours after sunrise as well as two hours before and one hour after sunset. Mountain Goat monitoring activities will occur daily throughout the winter and spring (November 1 – June 15) when construction activities are occurring at the ULRHEF lower tunnel portal and/or the ULRHEF intake. During winter months (November 1 – April 30), access to BDRHEF intake must be gated at least 500m from UWR to restrict public motorized use within the UWR (UL-12), unless otherwise directed by MFLNRO. If a mountain goat is observed within 500m line of sight of construction operations, construction must cease for at least 48 hours. The IEM must record and submit all goat observations to MFLNRO within 48 hours.

Component	Location	Wildlife/Archeology Concern	Construction/Timing Restrictions & Mitigations
TX Line	All Segments	Mountain Goat UWRs SO-04 & SO-08	If a mountain goat is observed within 500m line of sight of construction operations, construction must cease for at least 48 hours. Approval from the IEM must be obtained prior to recommencing construction activities, and the IEM must record and submit all goat observations to MFLNRO within 48 hours.
		Moose, Deer, & Mountain Goat UWRs	Construction will not be permitted within 200m of Moose and Deer UWR during the sensitive winter period (November 1 – February 28). Helicopter flight paths will avoid UWRs and landing locations will be located further than 500m away from the UWRs during the sensitive winter period (November 1 – February 28).
		Suitable Class 1 & 2 Grizzly Bear forage habitat	IEM monitoring is required when clearing within identified Class 1 & 2 Grizzly Bear forage habitat, to ensure clearing areas are minimized. Clearing and construction should avoid the fall and spring season to avoid displacing bears at ULH-GB26 near WHA 2-399, ULH-GB33 near the northwest side of the Camel's Back, at ULH-GB53 south of South Miller Creek; and at ULH-GB59 north of Rutherford Creek
		Riparian Vegetation Management Areas (RVMA)	IEM monitoring is required during clearing within RVMA's.
		Within 500 m of South Creek & Rohb Creek	Construction of the transmission line within 500 m of known salmon spawning streams, must be conducted outside the salmon migration period (October 15 – December 31) to avoid affecting Bald Eagle and Grizzly Bear foraging.
		Ryan River Drainage	Construction of the TX Line into and across the Ryan River drainage will occur during the less critical Grizzly Bear summer foraging period (June 1 – September 1).
		Within 150m of wetlands or 100m of Coastal Tailed Frog Streams	IEM presence is required when clearing within 150m of wetlands or 100m of CTF Streams, to ensure clearing areas are minimized.

4.0 Upper Lillooet River HEF – Monitoring Results

4.1 Construction Camp, KM38 Laydown, Access Roads & Lillooet River FSR

Construction Activities:

- CE continued routine fuel management and maintenance of construction equipment within the mechanic shop at the KM38 laydown. CE temporarily stored all hazardous substance materials (waste oil, contaminated soil, used oil/hydraulic fluid containers, etc.) in a designated area at the laydown prior to off-site disposal. The materials were all well contained and protected from the weather.
- CE completed temporary repairs on the culvert for the CTF bearing KM43 stream (**Error! Reference source not found. - Error! Reference source not found.**).

Environmental Summary:

- On October 29, the IEM observed that the culvert at KM43 on the Lillooet River FSR had been punctured (**Error! Reference source not found.**), increasing the likelihood that sediment would be deposited into the CTF bearing stream. The IEM notified CE's environmental staff of the issue and discussed temporary measures to prevent additional sediment from entering the creek. The IEM stressed that permeant repairs could not begin until a CTF salvage had been conducted and that they must be present before any temporary or permanent repairs began. Approximately, 3-hours later the IEM observed CE's crews installing a steel plate over the damaged culvert to protect it from further damage (**Error! Reference source not found.**). While it is unlikely that these works resulted in sediment additions to the watercourse, they began without verbal, written, or radio communication to the IEM, and no photos were taken during the installation of the steel plate. The IEM reminded CE that all construction activities within 30 metres of a watercourse required notification and for the IEM to be present before they could commence.

Photos:



Photo 1 – A hole punctured in the culvert crossing the Lillooet River FSR at KM43 (October 29, 2016).



Photo 2 – Crews installing a steel plate to temporarily protect the KM43 culvert (October 29, 2016).

4.2 Intake, Concrete Arch Foundation Walls, and Upstream Tunnel

Construction Activities:

- Installation and grouting of the BEBO tunnel arches (Photo 3).
- Backfill of the BEBO tunnel wall (Photo 4).
- Removal of the pumping system from the ULRHEF BEBO tunnel wall and upstream tunnel portal.
- Final shotcrete application in the upstream tunnel portal (Photo 5).
- Excavation and contouring of the slopes above the right bank of the Obermeyer channel (Photo 6).
- Shotcrete application on the right bank wall of the Obermeyer channel (Photo 7).
- Decommissioning of the ULRHEF intake water treatment system.

Environmental Summary:

- CE directed all seepage water to the ULRHEF intake sediment basins for treatment during concrete works for the final tunnel lining and BEBO tunnel wall. On October 30, crews began removing pumps from the upstream portal allowing water to flush down the tunnel cleaning any residual sediment. All water was collected in the rock trap at the downstream end of the tunnel and pumped to the downstream active water treatment system (see Section 4.3 for more detail). The ULRHEF intake sediment basins were decommissioned on November 2. While the active water treatment system was in operation, CE's environmental management team ensured that it was functioning and well maintained. Additional water quality sampling results are available upon request.
- On October 29, the IEM observed a crane transporting bags of shotcrete over the Lillooet River, to crews preparing to stabilize a portion of the right bank of the Obermeyer diversion channel (Photo 7). CE had not notified the IEM of these activities. The IEM reminded CE that it was their responsibility, as outlined in the project CEMP and EPPs, to notify the IEM of all construction activities occurring within 30 metres of a watercourse a minimum of 48 hours prior to their commencement. The IEM also noted that crews had not installed mitigation measures to prevent the generation or treatment of concrete water within the Obermeyer channel. Lastly, the IEM documented water exceeding BCWQGs for pH in retention ponds above the Obermeyer structure, likely residual water from the Obermeyer repairs. The IEM informed CE that these ponds needed to be treated with CO₂ or pumped to the ULRHEF intake active water treatment system for treatment before the water could be discharged to the Lillooet River (Photo 8).
- During night shift (October 31 – November 1), CE completed the final section of shotcrete in the ULRHEF tunnel, near the connection with the BEBO tunnel wall. To ensure concrete waste water was not transported down the tunnel and discharged to Truckwash Creek through the flushing pipe, crews implemented the following mitigation measures:
 - Crews installed a CO₂ injection box in the rock trap, at the downstream end of the ULRHEF tunnel.

- Crews installed a CO₂ diffuser in the rock trap to increase treatment capacity, if needed.
- CE used dry shotcrete allowing equipment to be place on a dry surface further away from the wet work area.
- Crews placed a tarp on the ground surrounding the work area, built a berm directly below the application area, and hung plastic sheeting on both side of the work area to prevent shotcrete splatted from entering seepage water within the tunnel (Photo 5).
- Crews had not yet installed the last section of the penstock at the downstream tunnel portal, allowing them to pump water from the tunnel to the downstream portal active water treatment system, if necessary.

The IEM monitored all shotcrete activities and collected water samples from within the tunnel and at the downstream tunnel portal. All water discharged to Truckwash Creek met BCWQG and the IEM did not observe any environmental issues associated with these construction activities.

Photos:



Photo 3 – BEBO tunnel arch installation and grouting (October 25, 2016).



Photo 4 – Back fill of the BEBO tunnel wall (October 28, 2016).



Photo 5 – Final shotcrete application in the ULRHEF tunnel (November 1, 2016).



Photo 6 – Excavation above the Obermeyer channel (November 4, 2016).



Photo 7 – Transport of shotcrete over the Lillooet River to the Obermeyer channel (October 29, 2016).



Photo 8 – Pumping high pH water above the Obermeyer channel to the water treatment system (October 31, 2016).

4.3 Downstream Tunnel Portal

Construction Activities:

- Pump removal and tunnel flushing (Photo 9 - Photo 10).
- Welding and coating of ULRHEF penstock.
- Soil sampling of the mechanic shop at KM44.7.
- Demobilization of the ULRHEF downstream portal active water treatment system.

Environmental Summary:

- The IEM monitored the discharge from the active water treatment system for compliance with BCWQG until November 1, when the system was decommissioned and removed from site. Water discharged to ASTR-03 did not exceed > 8 NTU above background

turbidity during the reporting period. Additional water quality sampling results are available upon request.

- On October 30, CE turned off all pumps in the tunnel for intervals of five minutes allowing water to flow down the tunnel and flush out any remaining sediment to the rock trap at the bottom end of the tunnel (Photo 9). The flushing pipe, installed in the rock trap, was closed to prevent flushing water from discharging to Truckwash Creek (Photo 10). As water filled the rock trap the IEM monitored water quality to ensure compliance with BCWQGs. Crews repeatedly flushed the tunnel for two days, all water was pumped to the downstream portal active water treatment system because of high pH. On November 1, water quality met BCWQGS and crews opened the flushing pipe to allow the water to discharge to Truckwash Creek. The IEM monitored all flushing activities and did not observe any environmental issues. Additional water quality results are available upon request.
- On October 27, CE's QP resampled soils from quadrant 2 of the KM44.7 mechanic shop that exceeded the soil standards for Urban Park, and inherently Wildlands. Results showed hydrocarbon contaminant concentrations within quadrant 2 met the soil standards for deep soils for wildlands (greater than 3 metres below ground). Therefore, CE could relocate the contaminated soil from quadrant 2 to an area where it could be buried greater than 3m deep while staying above the highest potential water table elevation. Additionally, the contaminated soil must be capped with a minimum of 3 metres of clean material immediately after it is deposited.

Photos



Photo 9 – ULRHEF rock trap filling with water from the tunnel flushing activities (October 30, 2016).

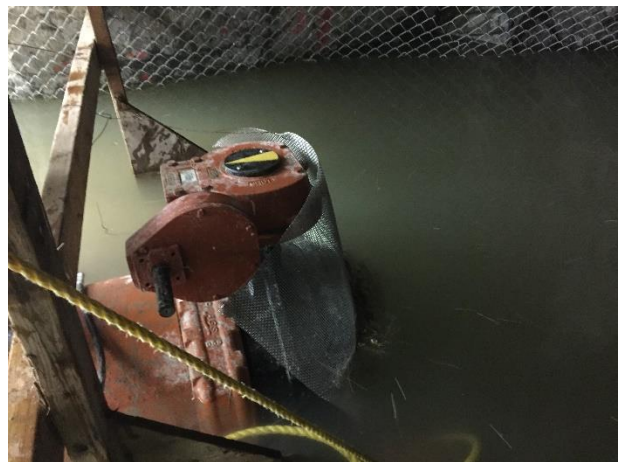


Photo 10 – Blocked flushing pipe in the ULRHEF rock trap (October 30, 2016).

4.4 ***Penstock and Truckwash Creek Penstock Crossing***

Construction Activities:

- Tie-in of the ULRHEF penstock at the downstream tunnel portal (Photo 11).
- Backfill, top soil placement, and planting of the Mountain Goat corridor on the right bank of Truckwash Creek (
- Photo 12 - Photo 13).

Environmental Summary:

- CE completed construction of the reclamation and landscape restoration of the Mountain Goat corridor on the right bank of Truckwash Creek, including top soil placement and riparian planting on October 29 (
- Photo 12 - Photo 13). The corridor and riparian plantings were completed as outlined by CE's QP (Ecofish). The IEM did not observe any environmental issues associated with these construction activities.

Photos:



Photo 11 - Placement of the final penstock piece at the ULRHEF downstream tunnel portal (November 3, 2016).



Photo 12 – Backfill of the Mountain Goat corridor on the right bank of Truckwash Creek (October 26, 2016).



Photo 13 – Riparian planting of the Mountain Goat corridor on the right bank of Truckwash Creek (October 29, 2016).

4.5 *Powerhouse, Tailrace & Access Road*

Construction Activities:

- Andritz mechanical and electrical works continued within the ULRHEF powerhouse

(Photo 14).

- Continued construction and chain link fence installation around the ULRHEF switchyard (Photo 15).
- CE continued to address deficiencies on the ULRHEF powerhouse superstructure (Photo 16).

Environmental Summary:

- The IEM monitored construction activities throughout the monitoring period and observed no environmental issues.

Photos:



Photo 14 – Andritz mechanical and electrical works in the ULRHEF powerhouse (November 4, 2016).



Photo 15 – Installation of the chain link fence surrounding the ULRHEF switchyard (October 26, 2016).



Photo 16 – Crews addressing deficiencies on the superstructure of the ULRHEF powerhouse (November 4, 2016).

4.6 **Water Quality Results**

The following table presents the results of the routine WQ sampling program for the ULRHEF.

The IEM is undertaking a weekly monitoring program according to the conditions outlined in the Surface Water Quality Protection Plan. The IEM selected the regular monitoring to quantify WQ conditions within the Lillooet River upstream and downstream of active construction areas. The IEM acknowledges the natural variability of instream WQ conditions in the Lillooet River due to seasonal fluctuations in snowmelt. In the event of an exceedance of in-situ WQ (turbidity and/or pH) because of project-related activities, the IEM will highlight the exceedance, discuss the cause, and outline measures undertaken by the contractor to correct the issue. When an exceedance cannot be attributed to project-related activities, an asterisk (*) will be used to denote it.

Date	Time	Sample Location Description	pH	Turbidity (NTU)	Cond (µS)	Temp (°C)
Routine Water Quality						
October 29, 2016	15:49	ULR Background – ULRHEF Intake	7.8	11.6	96	4.1
	16:17	ULR #0.5 – Downstream of ULRHEF intake at Keyhole Bridge	7.8	22.4*	107	4.3
	15:00	ULR # 1 – Upstream of ULRHEF Powerhouse	7.7	10.2	123	5.3
	12:01	ULR #2 – Downstream of ULRHEF Powerhouse between KM40.5 and KM41	7.8	9.4	114	4.9
	17:00	ULR #3 – Lillooet River FSR KM38 Laydown – D/S of Boulder confluence	7.8	10.9	99	5.3
	10:00	ULR #4 – Lillooet River FSR KM24 – D/S of all works and Meager confluence	7.5	10.9	122	5.0
November 4, 2016	13:51	ULR Background – ULRHEF Intake	7.1	8.1	89	4.6
	13:15	ULR #0.5 – Downstream of ULRHEF intake at Keyhole Bridge	6.7	12.9	90	4.8
	14:45	ULR # 1 – Upstream of ULRHEF Powerhouse	7.0	18.0*	101	5.2
	15:08	ULR #2 – Downstream of ULRHEF Powerhouse between KM40.5 and KM41	7.0	12.4	101	5.3
	16:58	ULR #3 – Lillooet River FSR KM 38 Laydown – D/S of Boulder confluence	7.0	11.2	99	5.3
	11:00	ULR #4 – Lillooet River FSR KM 24 – D/S of all works and Meager confluence	6.7	11.7	103	4.9

4.7 Recommendations

IEM recommendations for the ULRHEF are as follows:

- CE should remove material deposited on the downslope of the Lillooet River FSR between KM46.5 – 48 and hydro-seed exposed areas to prevent erosion during fall rains (*ULR#60*).
- CE should perform regular inspections at all parking areas and ensure all spilled fuel and/or oil is cleaned up and disposed of in the proper disposal container, as per the Human-Bear Conflict Management Plan, and Hazardous Materials Management Plan.
- CE should continue to provide training to foremen and crews on proper pumping procedures to prevent the off-site discharge of construction water that exceeds BCWQGs.
- CE should continue to install and maintain sediment and erosion control measures on the Lillooet River FSR and worksite access roads to prevent and control the generation of

sediment laden water.

- CE should continue to remind crews of proper food and wildlife attractant management, as per the Human – Bear and Human – Wildlife Interaction Management Plans.

4.8 Upcoming Works

New and/or environmentally sensitive construction activities scheduled to occur at the ULRHEF:

- Backfill of the BEBO tunnel wall.
- Welding and coating of the ULRHEF penstock.
- Remediation along the ULRHEF penstock alignment.
- Mechanical and electrical works in the ULRHEF powerhouse.

5.0 Boulder Creek Hydroelectric Facility – Monitoring Results

5.1 Access Road & Intake

Construction Activities:

- Rock hammering and excavation of the BDRHEF intake access road for buried conduit and pull box installation (Photo 17).
- Excavation and rock lining of ditches on the BDRHEF intake access road (Photo 18).
- Pulling fibre optic cables through the buried conduit along the access road.
- Formwork and concrete pour for the BDRHEF intake gutter (Photo 19).
- Grouting the BDRHEF Coanda (Photo 20).

Environmental Summary:

- The IEM monitored the discharge from the active water treatment system for compliance with BCWQG. Water discharged to Boulder Creek did not exceed > 8 NTU above background turbidity during the reporting period. Additional water quality sampling results are available upon request.
- The IEM monitored all construction activities at the BDRHEF intake and observed no environmental issues.

Photos:



Photo 17 – Buried conduit excavation on the BDRHEF intake access road (October 26, 2016).



Photo 18 – Rock lined ditching along the BDRHEF intake access road (November 4, 2016).



Photo 19 – Formwork and concrete for the BDRHEF intake cross-ditch (November 1, 2016).



Photo 20 – Hand grouting the BDRHEF Coanda (November 5, 2016).

5.2 *Downstream Tunnel Portal and Powerhouse*

Construction Activities:

- Final tunnel lining and rock support.
- Rock trap excavation, support, rebar, and formwork.
- Manifold installation (Photo 21).
- Andritz mechanical and electrical works in the BDRHEF powerhouse.
- BDRHEF powerhouse service bay slab concrete pour (Photo 22).

Environmental Summary:

- CE conveyed all wastewater related to the BDRHEF tunnelling works to the downstream settling ponds for treatment throughout the monitoring period (Photo 23).
- The IEM did not observe any environmental issues during the monitoring period.

Photos:



Photo 21 – Manifold installation at the BDRHEF powerhouse (November 5, 2016).



Photo 22 – Concrete pour for the BDRHEF service bay entrance (November 5, 2016).



Photo 23 – BDRHEF downstream tunnel settling ponds (October 23, 2016).

5.3 **Water Quality Results**

The following table presents the results of the routine WQ sampling program for the BDRHEF. The IEM is undertaking a weekly monitoring program according to the conditions outlined in the Surface Water Quality Protection Plan. The IEM selected the regular monitoring to quantify WQ conditions within Boulder Creek upstream and downstream of active construction areas. The IEM acknowledges the natural variability of instream WQ conditions in Boulder Creek due to seasonal fluctuations in snowmelt. In the event of an exceedance of in-situ WQ (turbidity and/or

pH) because of project-related activities, the IEM will highlight the exceedance, discuss the cause, and outline measures undertaken by the contractor to correct the issue. When an exceedance cannot be attributed to project-related activities, an asterisk (*) will be used to denote it.

Date	Time	Sample Location Description	pH	Turbidity (NTU)	Cond (µS)	Temp (°C)
Routine Water Quality						
October 29, 2016	15:31	BDR BG – Upstream of BDRHEF intake	7.5	4.7	84	2.6
		BDR #1 – Downstream of BDRHEF intake	Inaccessible			
	14:00	BDR #2 – Upstream of BDRHEF Powerhouse	7.3	6.1	90	2.4
	14:20	BDR #3 – Downstream of BDRHEF Powerhouse at Pebble Creek Bridge	7.4	4.1	86	2.3
November 4, 2016	15:47	BDR BG – Upstream of BDRHEF intake	7.3	4.5	89	4.2
		BDR #1 – Downstream of BDRHEF intake	Inaccessible			
	16:21	BDR #2 – Upstream of BDRHEF Powerhouse	7.1	3.3	86	4.8
	16:37	BDR #3 – Downstream of BDRHEF Powerhouse at Pebble Creek Bridge	7.0	4.1	86	4.9

5.4 Recommendations

IEM recommendations for the BDRHEF are as follows:

- CE should continue to direct all construction related wastewater to the active water treatment systems/settling ponds. CE should continue to monitor the newly constructed settling/infiltration pond to ensure that it remains in good working condition, and perform all maintenance activities as outlined in the work plan. If water begins to discharge from the newly constructed channel, CE should conduct regular inspections to ensure that it meets BCWQG prior to infiltration near or connection to with the Boulder Creek side channel.
- CE should regularly monitor the BDRHEF intake active water treatment system to ensure the system is functioning as intended and that discharge into Boulder Creek is within BCWQGs. The water treatment system capacity should be regularly assessed to ensure the system can handle the necessary volumes of water.

5.5 Upcoming Works

New and/or environmentally sensitive construction activities scheduled to occur at the BDRHEF:

- BDRHEF final tunnel lining and rock stabilization.
- Rock trap excavation, rebar, formwork, and concrete works in the downstream portion of the BDRHEF tunnel.
- Andritz electrical and mechanical works in the BDRHEF powerhouse.
- Bifurcation rebar and formwork.

6.0 Transmission Line – Monitoring Results

6.1 *Transmission Line Construction Activities*

Construction Activities:

Segment 8

- Burning slash piles (dependent on venting index)
- Slashing vegetation near towers 183, 200, and 382

Segment 9

- Stringing towers 202 – 203

Segment 11

- Framing structures

Segment 12

- Framing structures
- Setting poles with helicopter

Segment 13

- Burning slash piles (dependent on venting index)
- Pulling ropes, stringing lines, and tensioning lines at towers 319-348 and 383-398

Segment 14

- Stringing, tensioning, and clipping lines throughout the segment
- Pulling ropes, stringing lines, and tensioning towers 319-348 and 383-398

Segment 15

- Slashing vegetation near towers 183, 200, and 382
- Stringing lines, tensioning, and clipping throughout the segment
- Hazard tree felling
- Pulling ropes, stringing lines, and tensioning lines at towers 319-348 and 383-398

Segment 16

- Burning slash piles (dependent on venting index)
- Stringing, tensioning, and clipping lines throughout the segment

Environmental Summary:

- The IEM conducted spot checks on transmission line activities during the monitoring period and did not observe any environmental issues.

6.2 **Recommendations**

IEM recommendations for the Transmission Line are as follows:

- WEL’s Environmental Manager continues to provide regular scheduling updates that permits the IEM to assess environmental risks and coordinate monitoring requirements. WEL should continue to provide the IEM with a minimum of 48 hours’ notice if IEMs presence is required or expected for construction activities.

6.3 **Upcoming Works**

New and/or environmentally sensitive construction activities scheduled to occur along the Transmission Line alignment:

Segment 9

- Stringing towers 202-203

Segment 13

- Pulling ropes, straightening lines, and tensioning lines at towers 319-348 and 383 - 398

Segment 14

- Pulling ropes, straightening lines, and tensioning lines at towers 319-348 and 383 - 398

Segment 16

- Pulling ropes, straightening lines, and tensioning lines at towers 319-348 and 383 - 398

7.0 **Wildlife Sightings**

As per the CEMP, the IEM implemented a wildlife sightings record. Project Personal are required to regularly update the record and it is mandatory for all personnel to report wildlife sightings including, but not limited to bears, cougars, mountain goats and deer. Wildlife Observation forms will be included in first reporting period following month end. Observation or detection of the following species will trigger notification to identified parties according to the following table.

Species Observed or Detected	Notification Period	Agencies to be Notified
Northern rubber boa	Immediately	IEM, Owner
Grizzly bear	24hrs	IEM, Safety Officer, Conservation Officer, Owner
Wolverine den	24hrs	IEM, MFLNRO, Owner
Spotted owls	24hrs	IEM, MOE, Owner
Mountain goats	48hrs	IEM, MFLNRO, Owner

The Owner, Contractors, and IEM team reported the following wildlife sightings in October 2016:

Upper Lillooet Hydro Project - Wildlife Observation Form					
Date	Time	Observer (Company)	Species or Description	Location	Comments
10/1/2016	10:00	Stephanie Ellis (Sartori)	Black Bear	KM46.8	Juvenile
10/3/2016	11:30	Gilles Labrecque	Black Bear	KM47.9	-
10/3/2016	15:15	Jeremy Knox	Black Bear	KM43	-
10/05/2016	14:20	Cindi McPherson	Black Bear	KM46.5	mother w one dark cub, one blond cub
10/12/2016	4:00	Gary Archer	Moose	KM12	-
10/12/2016	17:00	Ian McKeachie	Black Bear	KM47.5	mother w one dark cub, one blond cub
10/15/2016	17:45	Sheena Wallace	Black Bear	KM0.5 Camp Road	-

8.0 Mountain Goat Monitoring Program

The mountain goat monitoring program resumed November 1, 2016. The following mitigation measures related to mountain goats were implemented during this monitoring period:

- The BDRHEF intake access road is gated and locked or manned by CE staff to restrict motorized public access to the UWR (UL-12) from November 1 – April 30.
- IEM was onsite to audit daily construction equipment shutdowns (November 1 - 30) beginning one hour before and two hours after sunrise as well as two hours before and one hour after sunset.
- There will be no noise meters installed in the fall of 2016 as there will be no blasting (with the exception of avalanche control blasting) or new "loud" construction activities. The IEM is satisfied with noise level reduction measures implemented during previous construction seasons, and as work is nearing completion, activities are likely to be less noisy in general. Blasting associated with avalanche control will be performed according to the avalanche blasting mitigation plan developed with feedback from previous noise monitoring results, which prescribes maximum blasting charge weights to be used during control work in each avalanche control path, in order to minimize noise to the extent possible. The IEM will continue to be onsite daily to monitor construction activities during the mountain goat migration period and sensitive winter months. If the IEM deems that noise monitoring becomes necessary we will return to performing active noise level monitoring via handheld noise monitoring equipment.
- The IEM or designate was on site to monitor Mountain Goat activity within 500m of construction activities at the ULRHEF intake and the ULRHEF downstream tunnel portal. Mountain goats were monitored from four sites:
 - Truckwash Creek viewing river right of the Migration Corridor– MG-OBS01 (10U 467955 5612773):
 - Keyhole Falls viewing the south side u-2-002 UL11 – MG-OBS02 (10U 466593 5613988); and,

- Garibaldi Pumice mine site viewing u-2-002 UL 19 – MG-OBS03 (10U 467388 561408); and,
- Salal Creek monitoring site viewing u-2-002 UL 8 – MG-OBS04 (10U 466133 5613991).

Monitoring effort was split between all sites during daylight hours, unless safety concerns or weather conditions interfered. The order of site visits rotated daily. To mitigate potential impacts to mountain goats during the sensitive winter period, construction activities will cease if a mountain goat(s) is (are) observed moving towards the ULRHEF intake and/or if a mountain goat(s) is (are) observed within a 500m line of site of a construction activity. No mountain goats were observed within 500m line of sight of construction activities and no work stoppages were required during this monitoring period.

9.0 Environmental Issues Tracking Matrix (ITM)

9.1 Hydroelectric Facilities (ULRHEF & BDRHEF)

ITM Tracking Legend:		Work Item Open		Work Item Complete		Issue Closed	
Issue Tracking		Environmental Issue		Mitigation Measures			
ID No.	Status	Location	Issue Description	Action Taken/Recommended	Date of Identification	Targeted Date for Completion	Date Completed
ULR#58	OPEN	All work areas	Conservation Officer and BCEAO Compliance and Enforcement Officer Inspection noted non-compliance with regard to wildlife attractant management.	1. Develop, implement and document internal waste and attractant management auditing tool. Tool will be available for use by the IEM and CE's EM Team. Records of inspections and noted non-compliances should be tracked internally with clean-up documented in each report. This tracking tool will be available to agencies upon request. This tool should be used similarly to the Spill Reporting tool currently being employed onsite.	July 6, 2016	July 9, 2016	July 8, 2016
				2. Repair and adjust the electric fences and charged entrance mats at the construction camp (perimeter fence, camp kitchen fence, and waste compactor fence) and surrounding the septic field.			July 21, 2016
				3. Install self-closing door hinges in all site lunchrooms and anywhere food is being stored temporarily (lunch rooms, kitchen storage area) OR adjust how food is transported, stored and consumed onsite to eliminate the possibility of food and food waste attractants onsite.			July 21, 2016
				4. Perform maintenance to clean-up grease and liquid waste around and underneath the garbage compactor			July 21, 2016
				5. Install berms surrounding parking areas that are lined with impermeable fabric in areas where tunneling equipment is parked. All leaks could be considered wildlife attractants; therefore all leaky equipment should be repaired and leaks or spills to ground in parking areas must be cleaned up daily and be disposed of in appropriate contaminated soil bins. Update October 27: CE continues to demobilize tunneling equipment, which remains parked within the lined parking areas. Leaks on the pad continue to be observed and should be removed on a regular basis as required to prevent			

ITM Tracking Legend:		Work Item Open					
		Work Item Complete					
		Issue Closed					
Issue Tracking		Environmental Issue		Mitigation Measures			
ID No.	Status	Location	Issue Description	Action Taken/Recommended	Date of Identification	Targeted Date for Completion	Date Completed
				<i>attracting wildlife. This item remains open as hydrocarbon staining in the parking areas continue to be observed.</i>			
ULR#60	OPEN	Lillooet River FSR from KM46 – 48	The road fill slope of the Lillooet River FSR between KM46 – 48 requires ESC measures to ensure slope stability and prevent rill erosion from transporting material into the forested area below.	1. <i>Assess the road fill slope conditions following conduit installation in the Lillooet River FSR in this section. Update September 30, 2016: CE and the IEM have assessed areas of concern and have discussed ESC stabilization/reclamation of the slopes by hydro-seeding with alder and hydro-mulch of appropriate strength (BFM) and at sufficient application rate.</i>	August 8, 2016	August 16, 2016	September 30, 2016
				2. <i>Provide and implement an agreed upon plan to protect the slope from an erosion and sediment transport perspective and/or a plan to initiate reclamation of the impacted area. Update October 27, 2016: A plan has been agreed upon, however the implementation remains outstanding. This issue has now been open for more than 2 months, and the window to successfully hydro-seed is nearly closed.</i>			
ULR#61	OPEN	Access roads and general ESC measures	ESC improvements are required to ensure the site performs well during the imminent fall rain events, and to maintain adherence to conditions of the CEMP, Ditch Management Plan, Erosion Prevention and Sediment Control Plan, and Surface Water Quality Protection Plan	1. <i>The IEM has prepared FAM13 which describes ESC and ditch management improvements, some of which have been in discussion since August 18, 2016. Individual items are outlined in FAM13, which was provided to the contractor on September 30.</i>	September 30, 2016	October 7, 2016	
				a. <i>Ditches and checks dams between KM48.5 and the Keyhole Bridge are in need of maintenance. CE should ensure these ditches are continuous, armored against erosion (appropriately spaced check dams/armor), and able to receive and convey runoff. Update: CE has installed pumps to temporarily divert sediment laden water to a vegetated area for infiltration until final road capping and drainage structures can be installed.</i>			October 25, 2016
				b. <i>The Lillooet River FSR drainage from KM47-48 must adequately convey runoff away from the stream at KM48. Update: CE has installed a pump to direct water away from the bridge deck and the fish bearing stream as a temporary measure to protect the watercourse. A temporary culvert has also been placed in the FSR to collect water flowing down the road surface and direct it away from the fish bearing stream.</i>			October 25, 2016

ITM Tracking Legend:		Work Item Open					
		Work Item Complete					
		Issue Closed					
Issue Tracking		Environmental Issue		Mitigation Measures			
ID No.	Status	Location	Issue Description	Action Taken/Recommended	Date of Identification	Targeted Date for Completion	Date Completed
				c. The temporary ULRHEF intake access road has no ditch installed and the upstream side of the laydown adjacent to the intake structure is likely to pool water or result in unmitigated runoff to the Lillooet River. Provide and implement a temporary drainage solution until this area is reclaimed. Cross ditches and berms have been installed to prevent turbid water from entering the Lillooet River,			October 21, 2016
				d. Ditching along the ULRHEF lower portal access road requires maintenance and the drainage pattern at the base of the road has changed since the installation of the Truckwash Creek penstock crossing. Provide temporary repairs to the ditch to ensure it can receive and convey road drainage and/or install final drainage (note: sediment laden water should not be directed to the UWR replacement area). Update: Water ponding in the work area has saturated the haul road; however sediment laden water is contained within the work area and is not flowing offsite. Final drainage solutions will be installed at a later date,			October 25, 2016
				e. The access road at ASTR-04 crossing pools road runoff and discharges sediment laden water to ASTR-04 during rain events. CE has indicated that they are aware of this concern and are working on developing and implementing a final solution for road drainage.			October 21, 2016
				f. The steep penstock access road leading down towards the powerhouse from PI-12 (~3+950) requires measures to protect the running surface. The IEM suggest implementing seasonal deactivation measures or installing a combination of cross ditching and ditch line check dams to prevent transporting sediment laden water to the base of the slope.			October 21, 2016
				g. The ULRHEF powerhouse access road ditch is not continuous, specifically the section along the toe of the spoil area. Install the appropriate drainage solution. This ditch is not yet installed, however ESC has not yet been a concern in this area			October 25, 2016

ITM Tracking Legend:		Work Item Open					
		Work Item Complete					
		Issue Closed					
Issue Tracking		Environmental Issue		Mitigation Measures			
ID No.	Status	Location	Issue Description	Action Taken/Recommended	Date of Identification	Targeted Date for Completion	Date Completed
				<p><i>h. The BDRHEF intake access road requires ditch maintenance, especially where ditches have been impacted by conduit installation. The access road also requires repair/grading where wheel ruts have resulted in water channelizing along the road alignment. Update October 27: While some ditch line improvements and road grading has been completed, the stretch of road between KM3.5-KM5 of the intake access road remains a concern as turbid road runoff continues to flow offsite during rain events. CE is in the process of installing conduit and finalizing the ditches and road grades in this area.</i></p>			
ULR #62	CLOSED	Lillooet River FSR drainage between KM42.5 – KM43.5-	Sediment laden road run-off discharging to watercourses and causing erosion of road edges.	<ol style="list-style-type: none"> 1. Assess and repair road drainage and erosion issues observed at KM43 of the Lillooet River FSR. 2. Ditching between KM43 and KM43.5 of the Lillooet River FSR should be assessed and repaired to convey clean water to CTF bearing streams in this area. 	October 25, 2016	October 29, 2016	October 27, 2016

9.2 Transmission Line

ITM Tracking Legend:		Work Item Open					
		Work Item Complete					
		Issue Closed					
Issue Tracking		Environmental Issue		Mitigation Measures			
ID No.	Status	Location	Issue Description	Action Taken/Recommended	Date of Identification	Targeted Date for Completion	Date Completed
<i>No outstanding environmental issues (next ITM – Tx#3)</i>							