Upper Lillooet Hydro Project

Weekly Environmental Monitoring Report #74

Reporting Period: October 4 – October 10, 2015

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)

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Owner Construction Permits and Approvals

Environmental Assessment Certificate No. E13-01 (Amendment 1, 2, 3, 4, 5 & 6)
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 (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 Amendments 1, 2, 3, 4, 5, 6, 7) No. L49717
Occupant Licence to Cut (BDRHEF – KM 38 laydown) No. L49698
Occupant Licence to Cut (BDRHEF Amendments 1, 2, 3) No. L49816
Occupant Licence to Cut (TX Line Amendment 1, 2, 3, 4, 5, 6, 7, 8, 9) No. L49697
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)

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. 326969 (Renewal 1)
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

ACRONYMS:

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

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	Weather Conditions	Key Monitoring Locations & Activities
Sunday, October 4	SE, DA	Clear	***Construction Camp, Laydown Areas and the Lillooet River FSR*** • Road maintenance on the Lillooet River FSR and camp access road ***ULRHEF Intake*** • Rebar and formwork installation • Drilling, blasting and tunnel stabilization • Dewatering to sediment basins ***ULRHEF Downstream Tunnel Portal*** • Drilling, blasting and tunnel stabilization ***ULRHEF Penstock*** • Excavation from 3+900 to 4+125 • Welding from 2+800 to 3+200 • Backfill from 3+200 to 3+500 ***ULRHEF Powerhouse*** • Rebar and formwork installation • Manifold installation ***BDRHEF Intake, Crane Pad and Access Road*** • Excavation, drilling and blasting for access ramp ***BDRHEF Downstream Tunnel Portal*** • Drilling, blasting and tunnel stabilization ***BDRHEF Powerhouse*** • Superstructure construction ***TX-Line*** • Segment 6 ➢ Stringing poles
Monday, October 5	SE, DA	Clear	***Construction Camp, Laydown Areas and the Lillooet River FSR*** • Road maintenance on the Lillooet River FSR ***ULRHEF Intake*** • Rebar and formwork installation • Concrete pour • Drilling, blasting and tunnel stabilization • Dewatering to sediment basins ***ULRHEF Downstream Tunnel Portal*** • Drilling, blasting and tunnel stabilization ***ULRHEF Penstock*** • Excavation from 3+900 to 4+125 • Welding from 2+800 to 3+200 • Backfill from 3+200 to 3+500 ***ULRHEF Powerhouse*** • Rebar and formwork installation • Manifold installation ***BDRHEF Intake, Crane Pad and Access Road*** • Excavation, drilling and blasting for access ramp ***BDRHEF Downstream Tunnel Portal*** • Drilling, blasting and tunnel stabilization ***BDRHEF Powerhouse*** • Superstructure construction

Date	IEM Team Personnel	Weather Conditions	Key Monitoring Locations & Activities
			TX-Line • Segment 6 ➢ Stringing and clipping • Segment 11 ➢ Seasonal road deactivation • Segment 12 ➢ Road construction for Road 305 • Segment 13 ➢ Road construction for Road 308 • Segment 14 ➢ Groundworks for pole foundations
Tuesday, October 6	SE, DA	Clear	***Construction Camp, Laydown Areas and the Lillooet River FSR*** • Road maintenance on the Lillooet River FSR • Stripping and grubbing the PAG storage area (KM 41.5 - 42 off of the Lillooet River FSR) ***ULRHEF Intake*** • Rebar and formwork installation • Excavation of sluiceway • Drilling, blasting and tunnel stabilization • Dewatering to sediment basins ***ULRHEF Downstream Tunnel Portal*** • Drilling, blasting and tunnel stabilization ***ULRHEF Penstock*** • Excavation from 3+900 to 4+125 • Welding from 2+800 to 3+200 • Backfill from 3+200 to 3+500 ***ULRHEF Powerhouse*** • Rebar and formwork installation • Structural concrete pour • Manifold installation ***BDRHEF Intake, Crane Pad and Access Road*** • Excavation, drilling and blasting for access ramp • Rock consolidation on right bank at intake ***BDRHEF Downstream Tunnel Portal*** • Drilling, blasting and tunnel stabilization ***BDRHEF Powerhouse*** • Superstructure construction ***TX-Line*** • Segment 6 ➢ Stringing and clipping • Segment 11 ➢ Seasonal road deactivation • Segment 12 ➢ Road construction for Road 305 • Segment 13 ➢ Road construction for Road 308 • Segment 14 ➢ Groundworks for pole foundations
Wednesday, October 7	SE, DA	Cloudy	***Construction Camp, Laydown Areas and the Lillooet River FSR*** • Road maintenance on the Lillooet River FSR • Stripping and grubbing the PAG storage area (KM 41.5 - 42 off of the Lillooet River FSR)

Date	IEM Team Personnel	Weather Conditions	Key Monitoring Locations & Activities
			ULRHEF Intake • Rebar and formwork installation • Drilling, blasting and tunnel stabilization • Dewatering to sediment basins ***ULRHEF Downstream Tunnel Portal*** • Drilling, blasting and tunnel stabilization ***ULRHEF Penstock*** • Welding from 2+800 to 3+200 • Backfill from 3+200 to 3+500 ***ULRHEF Powerhouse*** • Rebar and formwork installation • Manifold installation ***BDRHEF Intake, Crane Pad and Access Road*** • Excavation, drilling and blasting for access ramp • Rock consolidation on right bank at intake ***BDRHEF Downstream Tunnel Portal*** • Drilling, blasting and tunnel stabilization ***BDRHEF Powerhouse*** • Superstructure construction ***TX-Line*** • Segment 6 ➢ Stringing and clipping • Segment 11 ➢ Seasonal road deactivation • Segment 12 ➢ Road construction for Road 305 • Segment 13 ➢ Road construction for Road 308 • Segment 14 ➢ Groundworks for pole foundations
Thursday, October 8	SE, DA, TH	Overcast with rain	***Construction Camp, Laydown Areas and the Lillooet River FSR*** • Road maintenance on the Lillooet River FSR • Stripping and grubbing the PAG storage area (KM 41.5 - 42 off of the Lillooet River FSR) ***ULRHEF Intake*** • Rebar and formwork installation • Concrete pour • Drilling, blasting and tunnel stabilization • Dewatering to sediment basins ***ULRHEF Downstream Tunnel Portal*** • Drilling, blasting and tunnel stabilization ***ULRHEF Penstock*** • Welding from 2+800 to 3+200 • Backfill from 3+200 to 3+500 ***ULRHEF Powerhouse*** • Rebar and formwork installation • Manifold installation ***BDRHEF Intake, Crane Pad and Access Road*** • Excavation, drilling and blasting for access ramp • Rock consolidation on right bank at intake ***BDRHEF Downstream Tunnel Portal*** • Drilling, blasting and tunnel stabilization ***BDRHEF Powerhouse***

Date	IEM Team Personnel	Weather Conditions	Key Monitoring Locations & Activities
			• Superstructure construction • Deactivation of access road above powerhouse ***TX-Line*** • Segment 6 ➢ Stringing and clipping • Segment 11 ➢ Seasonal road deactivation • Segment 12 ➢ Road construction for Road 305 • Segment 13 ➢ Road construction for Road 308 • Segment 14 ➢ Groundworks for pole foundations ➢ Hand falling at structures 333 – 336
Friday, October 9	SE, DA	Fog and rain	***Construction Camp, Laydown Areas and the Lillooet River FSR*** • Road maintenance on the Lillooet River FSR ***ULRHEF Intake*** • Rebar and formwork installation • Drilling, blasting and tunnel stabilization • Dewatering to sediment basins ***ULRHEF Downstream Tunnel Portal*** • Drilling, blasting and tunnel stabilization ***ULRHEF Penstock*** • Welding from 2+800 to 3+200 • Backfill from 3+200 to 3+500 ***ULRHEF Powerhouse*** • Rebar and formwork installation • Manifold installation ***BDRHEF Intake, Crane Pad and Access Road*** • Excavation, drilling and blasting for access ramp • Rock consolidation on right bank at intake ***BDRHEF Downstream Tunnel Portal*** • Drilling, blasting and tunnel stabilization ***BDRHEF Powerhouse*** • Superstructure construction • Deactivation of access road above powerhouse ***TX-Line*** • Segment 6 ➢ Stringing and clipping • Segment 11 ➢ Seasonal road deactivation • Segment 12 ➢ Road construction for Road 305 • Segment 13 ➢ Road construction for Road 308 • Segment 14 ➢ Hand falling at structures 333 – 336
Saturday, October 10	SE, DA	Rain	***Construction Camp, Laydown Areas and the Lillooet River FSR*** • Road maintenance on the Lillooet River FSR ***ULRHEF Intake*** • Rebar and formwork installation • Concrete pour • Drilling, blasting and tunnel stabilization

Date	IEM Team Personnel	Weather Conditions	Key Monitoring Locations & Activities
			• Dewatering to sediment basins ***ULRHEF Downstream Tunnel Portal*** • Drilling, blasting and tunnel stabilization ***ULRHEF Penstock*** • Welding from 2+800 to 3+200 • Backfill from 3+200 to 3+500 ***ULRHEF Powerhouse*** • Rebar and formwork installation • Manifold installation ***BDRHEF Intake, Crane Pad and Access Road*** • Excavation, drilling and blasting for access ramp • Rock consolidation on right bank at intake ***BDRHEF Downstream Tunnel Portal*** • Closed due to landslide risk ***BDRHEF Powerhouse*** • Closed due to landslide risk ***TX-Line*** • No activity

IEM Team Personnel: *TH – Tom Hicks; SS – Stephen Sims; BA – Blake Aleksich; DA – Danita Abraham; SE – Stephanie Ellis; 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 6	*Email*	SES, INX, Ecofish	SES distributed the Spring 2015 Mountain Goat Monitoring Summary Report.	-
October 7	*Email*	SES, CE, INX	SES distributed noise monitoring results following blasting works at the BDRHEF intake. SES informed CE that the intent of noise monitoring was to allow time for adjustment and revision of blasting methods prior to the sensitive Mountain Goat winter period on Nov. 1.	-
	Email	INX, CE, SES	INX distributed the LTC for the BDRHEF Intake and Portal Excavation.	-
October 8	*Email*	WEL, INX, SES	WEL submitted a summary report outlining the 2015 Active Bird Nest Survey Results.	-
October 9	*Email*	CE, SES	CE's environmental management team confirmed that fish exclusion boxes were reinstalled on the pump intakes at the BDRHEF tunnel portal.	-
	Email	INX, JEM, SES	INX notified the IE and IEM teams of their formal submission to BC EAO, MFLNRO, and Lil'wat Nation requesting amendments to the Environmental Assessment Certificate and the General Wildlife Measures Exemption for the UWR overlapping the BDRHEF intake. INX requested to amend the winter work timing restrictions due to delays caused by several natural hazards in the area, including elevated fire hazards, the Boulder	-

Date	Communication Type	Participants	Issues Discussed	ITM ID No.
			Creek Wildfire, landslide risk thresholds and unanticipated challenges excavating the tunnels.	
October 10	*Email*	INX, MFLNRO, Squamish Mills, DFO, SLRD, SES	Heavy rainfall on October 10, caused the stream at 5km of the Lillooet River FSR to breach its banks and erode a section of the FSR. CE dispatched a crew to complete emergency works to prevent further damage and restore access along the FSR. INX sent emergency works notification to MFLNRO, DFO and SLRD. Squamish Mills, (primary road user) later dispatched a crew to complete finishing road repairs.	-

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
TX Line	Segments 6 – 14	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.
		Riparian Vegetation Management Areas (RVMA)	IEM monitoring is required during clearing within RVMAs.
		Surface Water Quality	IEM monitoring is required during culvert installation activities in non-fish bearing waters to document adherence to the Surface Water Quality Protection Plan objectives.
		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.
		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).
Lillooet River FSR & ULRHEF	Access roads above the lower limit of the 200m buffer Truckwash Creek Migration Corridor to the ULRHEF intake	Mountain Goat UWR & Migration Corridor	If a goat observation occurs within 500 m line-of-sight of construction activities, construction must cease for at least 48 hours. The IEM must record and submit all goat observations to FLNR within 48 hours.

4.0 Upper Lillooet River HEF – Monitoring Results

4.1 *Construction Camp, KM 38 Laydown, Access Roads & Lillooet River FSR*

Activities:

- Ditch installation at the KM 45 spoil area access road (Photo 1).
- Stripping and grubbing of the permanent PAG rock storage area (Photo 2). Organic material and woody debris will remain onsite for future restoration works.
- Routine maintenance of construction equipment within the mechanic shop and fuel management continued at the KM 38 laydown. All hazardous substance materials (waste oil, contaminated soil, used oil/hydraulic fluid containers, etc.) were stored temporarily for off-site disposal in a designated area at the laydown (Photo 3). The materials were all well contained and protected from the weather.
- The electric fences surrounding the construction camp were maintained and operational throughout this reporting period.

Environmental Summary:

- On October 8, the IEM assessed road conditions between KM 41 and 41.2 on the Lillooet River FSR (Photo 4). From the assessment, it is apparent that bank stabilization, ditching, and culvert installation works will be required to improve drainage and stabilize the road edge in this section of the FSR due to implementation of post-wildfire landslide assessment rock scaling requirement of the KM 40.5 to KM 41.2 slope. The IEM determined that the works would be able to be completed above the high water mark of the Lillooet River. Works are scheduled for the week of October 25 – 31.

Photos:

Photo 1 – Ditching access road to KM 45 spoil pile (October 5, 2015).

Photo 2 – Stripping and grubbing of the PAG rock storage area (October 6, 2015).

Photo 3 – Waste product storage area at KM 38 laydown (October 5, 2015).

Photo 4 – Road stabilization works required at KM 41 on the Lillooet River FSR (October 8, 2015).

4.2 *Intake (North & South Sides), and Upstream Tunnel Portal*

Construction Activities:

- Drilling, blasting and tunnel stabilization at the ULRHEF upstream portal.
- Rebar and formwork installation.
- Concrete pours for intake structure (Photo 5 Photo 6).
- Excavation and mud-slab concrete pour at sluiceway location (Photo 7).
- Dewatering to ULRHEF intake sediment basins (Photo 8 and Photo 9).

Environmental Summary:

- All turbid or alkaline water resulting from activities at the ULRHEF intake or upstream tunnel portal is pumped to the ULRHEF intake sediment basins (Photo 8 and Photo 9). A dedicated CE crewmember is present to monitor the pumps within the intake work area and tunnel portal during active construction works. This person has the responsibility of directing all turbid or alkaline water to the sediment ponds and must verify with CE environmental staff or the IEM prior to directing any water to the Lillooet River. All water in the intake sediment basins infiltrated to ground during this reporting period. The water has reached the last sediment basin cell (Photo 9).

Photos:

Photo 5 – Concrete pour at the ULRHEF intake (October 7, 2015).

Photo 6 – Concrete pour at the ULRHEF intake (October 7, 2015).

Photo 7 – Concrete pour at ULRHEF intake sluiceway location (October 8, 2015).

Photo 8 – ULRHEF upstream tunnel portal sump (October 5, 2015).

Photo 9 – ULRHEF intake sediment basin outlet pipe (October 5, 2015).

4.3 *Downstream Tunnel Portal*

Construction Activities:

- Drilling, blasting, mucking and stabilization works within the tunnel (Photo 10).
- Dewatering to downstream tunnel portal settling ponds (Photo 11).

Environmental Summary:

- The downstream portal infiltration ponds reached capacity and water began discharging to a vegetated area southwest of the ponds during this reporting period (Photo 11 and Photo 12). The IEM monitored the seepage flow from the ponds throughout the reporting period and confirmed that the water infiltrated in the vegetated area and was not discharged to the surrounding environment.

Photos:

Photo 10 – Current conditions at the ULRHEF downstream tunnel portal (October 8, 2015).

Photo 11 – ULRHEF downstream tunnel portal infiltration ponds (October 10, 2015).

Photo 12 – ULRHEF downstream tunnel portal infiltration pond seepage (October 10, 2015).

4.4 *Penstock*

Construction Activities:

- Penstock excavation, installation and backfill continued from 3+300 to 3+900 (Photo 13).
- Penstock welding continued from 2+900 to 3+700 (Photo 14).

Environmental Summary:

- No environmental issues were observed or reported at the ULRHEF penstock during this reporting period.

Photos:

Photo 13 – Penstock backfill works (October 5, 2015).

Photo 14 – Penstock welding near 3+500 (October 5, 2015).

4.5 *Powerhouse & Access Road*

Construction Activities:

- Formwork and rebar installation (Photo 15).
- Structural concrete pour on October 6 (Photo 16).

Environmental Summary:

- On October 6, the IEM was onsite to inspect the ULRHEF powerhouse during a concrete pour. The IEM conducted water quality sampling of the powerhouse sump discharge. All water samples were measured to have a pH <9 and suitable for discharge to the surrounding environment as per the Surface Water Quality Protection Plan. See Section 4.6 Water Quality Results.

Photo 15 – Current conditions at the ULRHEF powerhouse (October 6, 2015).

Photo 16 – Structural concrete pour at the ULRHEF powerhouse (October 6, 2015).

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 regular monitoring sites 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 melt fluctuations and large tributary inputs. In the event that an exceedance of *in-situ* WQ (turbidity and/or pH) is deemed to be caused by 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, the exceedance will be marked by an asterisk (*).

Date	Time	Sample Location Description	pH	Turbidity (NTU)	Cond (*u*S)	Temp (°C)
Routine Water Quality						
October 7, 2015	14:53	ULR Background – ULRHEF Intake	7.6	50.5	72	6.5
	15:05	ULR #0.5 – Downstream of ULRHEF intake at Keyhole Bridge	7.7	48.8	74	6.4
	13:35	ULR # 1 – Upstream of ULRHEF Powerhouse	7.5	52.9	76	6.5
	15:47	ULR #2 – Downstream of ULRHEF Powerhouse between KM 40.5 and KM 41	7.7	50.6	77	6.8
	16:35	ULR #3 – Lillooet River FSR KM 38 Laydown – D/S of Boulder confluence	7.7	36.5	78	7.3
	17:24	ULR #4 – Lillooet River FSR KM 24 – D/S of all works and Meager confluence	7.8	36.7	89	8.4
ULRHEF Powerhouse Concrete Pours						
October 6, 2015	10:58	Outlet of ULRHEF powerhouse dewatering hose	7.1	-	-	-

4.7 *Recommendations*

IEM recommendations for the ULRHEF are as follows:

- All seepage water in the intake excavation and portal should be conveyed to the sediment basins unless approved for discharge directly to the Lillooet River by the IEM or CE environmental manager.
- The IEM recommends that the access roads and tributaries on the penstock alignment be monitored regularly to ensure that no ESC issues develop with the continued installation works and traffic.
- Maintenance of the downstream portal infiltration ponds is required to restore their function and ensure continued adherence to the Surface Water Quality Management Plan.
- The ULRHEF powerhouse sump water should be monitored regularly. Alkaline or turbid water should be pumped to the settling ponds for treatment.

4.8 *Upcoming Works*

The following new and/or environmentally sensitive construction activities are scheduled to occur at the ULRHEF in the upcoming reporting period(s):

- Tunneling activities will continue at the ULRHEF intake portal.
- Rebar and formwork installation will continue at the ULRHEF intake.
- Dewatering to the ULRHEF intake sediment basins will continue.
- Tunneling activities will continue at the ULRHEF downstream tunnel portal.
- Penstock installation will continue.
- Rebar installation, formwork and concrete pours will continue at the ULRHEF powerhouse.

5.0 Boulder Creek Hydroelectric Facility – Monitoring Results

5.1 *Intake Access Road & Crane Pad*

Construction Activities:

- Drilling, blasting and excavation for access ramp construction at BDRHEF intake (Photo 17).
- Rock consolidation works on the right bank at the intake (Photo 18).

Environmental Summary:

- On October 1, 2015 the IEM installed a noise meter to monitor noise generated by construction activities at the BDRHEF intake, which are within UWR UL 12. The data collected will be used to inform the contractor of noise levels generated during work at the intake and will help guide adaptive management strategies if noise levels are consistently above the 75dBA noise level threshold.
- CE completed all reasonable mitigation measure to reduce the amount of blast rock lost to

the river during each blast at the Boulder intake crane pad; however blast rock did enter the river during some of the blasts. The IEM was onsite to monitor water quality following each blast and no visible water quality impacts were observed. The IEM has determined that the blast rock lost to the creek did not cause environmental impact or concern for the following reasons:

- Boulder creek is non-fish bearing at the intake,
- The rock was blasted using gel based explosives and not ANFO,
- The rock was classified as non-PAG,
- The size of the rock was predominantly large, and mostly free of fines,
- The material fell within the authorized footprint of the intake work area;
- No visual impacts to water quality were observed (water quality was not able to be sampled due to access limitations), and,
- All the rock will be removed during construction of the intake structure.

Photos:

Photo 17 – Excavation for access ramp at BDRHEF intake (October 6, 2015).

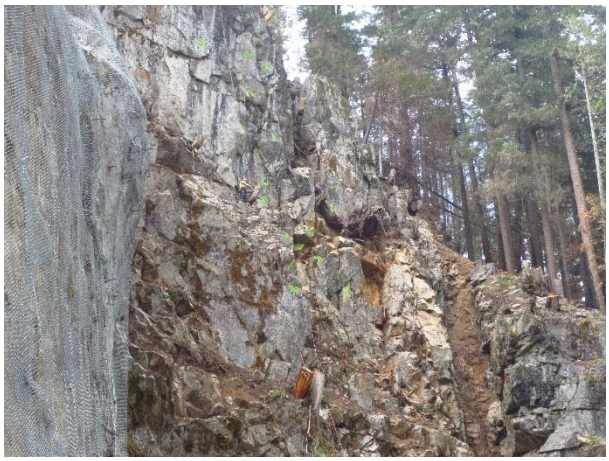

Photo 18 – Rock consolodation work on right bank at the BDRHEF intake (October 6, 2015).

5.2 *Downstream Tunnel Portal and Powerhouse*

Construction Activities:

- BDRHEF powerhouse superstructure construction (Photo 19).
- Drilling, blasting, mucking and stabilization works within the tunnel.
- Dewatering of the tunnel and powerhouse to the oil water separator and settling ponds continued.

Environmental Summary:

- All wastewater related to the BDRHEF tunnelling works continued to be contained and conveyed to the downstream portal settling ponds for treatment. The water in the settling

ponds continues to infiltrate to ground and has yet to reach the fourth cell.

- Access road northeast of BDRHEF powerhouse was deactivated during this reporting period (Photo 20). The existing road surface was de-compacted with an excavator and organic material and coarse woody debris was placed to promote revegetation.
- The fish exclusion boxes were re-installed for the pump intakes in Boulder Creek near the BDRHEF tunnel portal (Photo 21).

Photos:

Photo 19 – BDRHEF powerhouse structure (October 5, 2015).

Photo 20 – Deactivated access road northeast of BDRHEF powerhouse (October 8, 2015).

Photo 21 – Fish exclusion boxes re-installed on pump intakes in Boulder Creek (October 9, 2015).

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 regular monitoring sites have been selected 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 Boulder Creek due to seasonal fluctuations in snowmelt. In the event that an exceedance of *in-situ* WQ (turbidity

and/or pH) is deemed to be caused by 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, the exceedance will be marked by an asterisk (*).

Date	Time	Sample Location Description	pH	Turbidity (NTU)	Cond (uS)	Temp (°C)
Routine Water Quality						
October 7, 2015	-	BDR BG – Upstream of BDRHEF intake *not currently accessible*	-	-	-	-
	-	BDR #1 – Downstream of BDRHEF intake *not currently accessible*	-	-	-	-
	16:02	BDR #2 – Upstream of BDRHEF Powerhouse	7.6	7.3	72	7.8
	16:14	BDR #3 – Downstream of BDRHEF Powerhouse at Pebble Creek Bridge	7.6	7.0	73	7.8

5.4 *Recommendations*

IEM recommendations for the BDRHEF are as follows:

- All wastewater related to the BDRHEF tunnelling works should continue to be contained and conveyed to the downstream portal settling ponds for treatment. Regular inspections of the treatment ponds should be performed to ensure the necessary maintenance activities outlined in the work plan are performed.

5.5 *Upcoming Works*

The following new and/or environmentally sensitive construction activities are scheduled to occur at the BDRHEF in the upcoming reporting period(s):

- Blasting and excavation works will continue for the BDRHEF intake access ramp.
- BDRHEF downstream portal tunnelling works will continue.
- Superstructure construction will continue.

6.0 Transmission Line – Monitoring Results

6.1 *Transmission Line Construction Activities*

Right-of-Way Clearing:

- Hand falling for structures 333 – 336 in Segment 14.

Existing Road Upgrades and Access Road Construction

- Seasonal road deactivation in Segment 11.
- Road construction on Road 305 in Segment 12.
- Road construction on Road 306 in Segment 13.

Transmission Line Pole Installation, Line Stringing and Clipping

- Stringing and clipping in Segment 6.
- Groundworks for pole foundations in Segment 14.

Environmental Summary:

- The IEM was present as required when clearing activities occurred within 150m of wetlands, 15m RVMAs (30m for CTF streams), 100m of Coastal Tailed Frog Streams, Class 1 & 2 suitable Grizzly Bear WHA and/or suitable forage habitat, moose and deer UWR, legally designated Old Growth Management Areas (OGMAs) or within Northern Goshawk, Spotted Owl or Western Screech-Owl nesting habitat (during breeding season). All flagged boundaries were respected during clearing activities. No environmental issues were observed.

6.2 *Water Quality Results*

Date	Time	Sample Location Description	pH	Turbidity (NTU)	Cond (uS)	Temp (°C)
No construction activities involving water management were conducted during this reporting period.						

6.3 *Recommendations*

- The IEM has no recommendations at this time.

6.4 *Upcoming Works*

- Post-wildfire rebuild works in Segment 1 and 2.
- Clipping conductors in Segment 6.
- Road construction in Segment 12 and 13.
- Hand falling in Segment 14.

7.0 Wildlife Sightings

As per the CEMP, a wildlife sightings record has been implemented and will be updated regularly by Project Personnel. It is mandatory for all personnel to report wildlife sightings including, but not limited to bears, cougars, mountain goats and deer. Wildlife sighting will be reported and recorded by the contractor(s). 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

8.0 Mountain Goat Monitoring Program

The following mitigation measures related to mountain goats were implemented during this monitoring period:

- Noise level monitoring commenced one month earlier to collect data to be used to adaptively manage construction noise and ensure that the 75db noise level threshold is not exceeded as outlined in the Mountain Goat Management Plan.
- As of October 2, 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. The mountain goat monitoring program was initiated a month early to collect information on mountain goat movement and activities post Boulder Creek Wildfire (V30241). 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. Construction activities must cease if a goat(s) are observed moving towards the ULRHEF intake and/or if a goat(s) are observed within a 500m line of site of a construction activity. No goats were observed within 500m line of sight of construction activities and no work stoppages were required.

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
No outstanding environmental issues (next ITM – ULR#25)							

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
No outstanding environmental issues (next ITM – Tx#3)							