Upper Lillooet Hydro Project

Weekly Environmental Monitoring Report #66

Reporting Period: June 14 – June 20, 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

Contractor Construction Permits and Approvals

Magazine Licence File No. UL76018 (Renewal 1)
Section 8 Approval – Short Term Use of Water File (Lillooet River and Tributaries) No. A2006123 (Amendment 1)
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
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) dated March 18, 2015

ACRONYMS:

AMBNS	Active Migratory Bird Nesting Survey
Andritz	Andritz Hydro Canada Inc.
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
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
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, June 14	SE	Sunny	***Construction Camp, Laydown Areas and the Lillooet River FSR*** • Dust suppression on Lillooet River FSR from 37.5km to 45km ***ULRHEF Intake*** • Drilling, blasting and excavation ***ULRHEF Downstream Tunnel Portal*** • Drilling, blasting and tunnel stabilization ***ULRHEF Penstock*** • No activity ***ULRHEF Powerhouse*** • Rebar installation and formwork ***BDRHEF Intake, Crane Pad and Access Road*** • Rock hammering and excavation • Slope stabilization works ***BDRHEF Downstream Tunnel Portal*** • Drilling, blasting and tunnel stabilization ***BDRHEF Powerhouse*** • Preparation for superstructure construction ***TX-Line*** • Segment 7 ➢ Stringing, tensioning and clipping • Segment 11 ➢ Road construction on Branch A near structure 263 ➢ Hand falling from structure 268 – 272 • Segment 12 ➢ Slashing from structure 283 – 296 • Segment 13 ➢ Road construction on road 306 ➢ Hoe chucking near structure 316 • Segment 14 ➢ Road construction on Pemberton Main and 371.1
Monday, June 15	TH, BA	Sunny	***Construction Camp, Laydown Areas and the Lillooet River FSR*** • Dust suppression on Lillooet River FSR from 37.5km to 45km ***ULRHEF Intake*** • Drilling, blasting and excavation ***ULRHEF Downstream Tunnel Portal*** • Drilling, blasting and tunnel stabilization ***ULRHEF Penstock*** • No activity ***ULRHEF Powerhouse*** • Rebar installation and formwork ***BDRHEF Intake, Crane Pad and Access Road*** • Rock hammering and excavation • Slope stabilization works ***BDRHEF Downstream Tunnel Portal*** • Drilling, blasting and tunnel stabilization

Date	IEM Team Personnel	Weather Conditions	Key Monitoring Locations & Activities
			BDRHEF Powerhouse • Preparation for superstructure construction ***TX-Line*** • Segment 7 ➢ Stringing, tensioning and clipping • Segment 11 ➢ Road construction on Branch A near structure 263 ➢ Hand falling from structure 268 – 272 • Segment 12 ➢ Slashing from structure 283 – 296 • Segment 13 ➢ Road construction on road 306 ➢ Hoe chucking near structure 316 • Segment 14 ➢ Road construction on Pemberton Main and 371.1Road construction
Tuesday, June 16	BA, TH	Sunny	***Construction Camp, Laydown Areas and the Lillooet River FSR*** • Dust suppression on Lillooet River FSR from 37.5km to 45km ***ULRHEF Intake*** • Drilling, blasting and excavation ***ULRHEF Downstream Tunnel Portal*** • Drilling, blasting and tunnel stabilization ***ULRHEF Penstock*** • No activity ***ULRHEF Powerhouse*** • Rebar installation and formwork ***BDRHEF Intake, Crane Pad and Access Road*** • Rock hammering and excavation • Slope stabilization works ***BDRHEF Downstream Tunnel Portal*** • Drilling, blasting and tunnel stabilization ***BDRHEF Powerhouse*** • Preparation for superstructure construction ***TX-Line*** • Segment 7 ➢ Stringing, tensioning and clipping • Segment 9b ➢ Helipad clearing and construction • Segment 11 ➢ Road construction on Branch A near structure 263 ➢ Hand falling from structure 268 – 272 • Segment 12 ➢ Slashing from structure 283 – 296 • Segment 13 ➢ Road construction on road 306 • Segment 14 ➢ Road construction on Pemberton Main and 371.1
Wednesday, June 17	BA, AA	Sunny	***Construction Camp, Laydown Areas and the Lillooet River FSR*** • Dust suppression on Lillooet River FSR from 37.5km to 45km • Road maintenance on penstock access road

Date	IEM Team Personnel	Weather Conditions	Key Monitoring Locations & Activities
			ULRHEF Intake • Drilling, blasting and excavation ***ULRHEF Downstream Tunnel Portal*** • Drilling, blasting and tunnel stabilization ***ULRHEF Penstock*** • No activity ***ULRHEF Powerhouse*** • Rebar installation and formwork ***BDRHEF Intake, Crane Pad and Access Road*** • Rock hammering and excavation • Slope stabilization works ***BDRHEF Downstream Tunnel Portal*** • Drilling, blasting and tunnel stabilization ***BDRHEF Powerhouse*** • Preparation for superstructure construction ***TX-Line*** • Segment 7 ➢ Stringing, tensioning and clipping • Segment 9a ➢ Trail cutting near structure 203 – 217 ➢ Groundworks for pole foundations • Segment 9b ➢ Helipad clearing and construction • Segment 11 ➢ Road construction on Branch A near structure 263 ➢ Hand falling from structure 268 – 272 • Segment 13 ➢ Road construction on road 306 • Segment 14 ➢ Road construction on Pemberton Main and 371.1
Thursday, June 18	BA, AA, TJ	Sunny	***Construction Camp, Laydown Areas and the Lillooet River FSR*** • Dust suppression on Lillooet River FSR from 37.5km to 45km ***ULRHEF Intake*** • Drilling, blasting and excavation ***ULRHEF Downstream Tunnel Portal*** • Drilling, blasting and tunnel stabilization ***ULRHEF Penstock*** • No activity ***ULRHEF Powerhouse*** • Rebar installation and formwork ***BDRHEF Intake, Crane Pad and Access Road*** • Rock hammering and excavation • Slope stabilization works ***BDRHEF Downstream Tunnel Portal*** • Drilling, blasting and tunnel stabilization ***BDRHEF Powerhouse*** • Preparation for superstructure construction ***TX-Line*** • Segment 4 ➢ Framing structures 73 & 74

Date	IEM Team Personnel	Weather Conditions	Key Monitoring Locations & Activities

			• Segment 7
			  ➢ Stringing, tensioning and clipping
			• Segment 9a
			  ➢ Trail cutting near structure 203 – 217
			  ➢ Groundworks for pole foundations
			• Segment 9b
			  ➢ Helipad clearing and construction
			• Segment 11
			  ➢ Road construction on Branch A near structure 263
			• Segment 13
			  ➢ Road construction on road 306
			• Segment 14
			  ➢ Road construction on Pemberton Main and 371.1

Friday, June 19	BA, AA, TJ	Sunny	***Construction Camp, Laydown Areas and the Lillooet River FSR***
			• Dust suppression on Lillooet River FSR from 37.5km to 45km
			ULRHEF Intake
			• Drilling, blasting and excavation
			ULRHEF Downstream Tunnel Portal
			• Drilling, blasting and tunnel stabilization
			ULRHEF Penstock
			• No activity
			ULRHEF Powerhouse
			• Rebar installation and formwork
			BDRHEF Intake, Crane Pad and Access Road
			• Rock hammering and excavation
			• Slope stabilization works
			BDRHEF Downstream Tunnel Portal
			• Drilling, blasting and tunnel stabilization
			BDRHEF Powerhouse
			• Preparation for superstructure construction
			TX-Line
			• Segment 4
			  ➢ Framing structures 73 & 74
			• Segment 9a
			  ➢ Trail cutting near structure 203 – 217
			  ➢ Groundworks for pole foundations
			• Segment 9b
			  ➢ Helipad clearing and construction
			  ➢ Hand falling
			• Segment 11
			  ➢ Road construction on Branch A near structure 263
			• Segment 13
			  ➢ Road construction on road 306
			• Segment 14
			  ➢ Road construction on Pemberton Main and 371.1

Saturday, June 20	SE, TJ	Sunny	***Construction Camp, Laydown Areas and the Lillooet River FSR*** • Dust suppression on Lillooet River FSR from 37.5km to 45km ***ULRHEF Intake*** • Drilling, blasting and excavation ***ULRHEF Downstream Tunnel Portal*** • Drilling, blasting and tunnel stabilization

Date	IEM Team Personnel	Weather Conditions	Key Monitoring Locations & Activities
			ULRHEF Penstock • No activity ***ULRHEF Powerhouse*** • Rebar installation and formwork ***BDRHEF Intake, Crane Pad and Access Road*** • Rock hammering and excavation • Slope stabilization works ***BDRHEF Downstream Tunnel Portal*** • Drilling, blasting and tunnel stabilization ***BDRHEF Powerhouse*** • Preparation for superstructure construction ***TX-Line*** • Segment 4 ➢ Stringing poles • Segment 9a ➢ Groundworks for pole foundations

IEM Team Personnel: *TH – Tom Hicks; SS – Stephen Sims; BA – Blake Aleksich; VD – Vanessa Dan; AA – Anthony Andrews; AS—Anne Sutherland; DA – Danita Abraham; TJ – Tammie Jenkins; SE – Stephanie Ellis*

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.
June 15 & 16, 2015	*Email*	SES, CE, BKL, INX	On June 15, BKL notified SES of two noise exceedances recorded at the BDRHEF intake noise monitoring site that occurred at 22:02 on June 11, (duration = 1 second; max = 75.4 dBA, and duration = 2 seconds; max = 78.6 dBA). On June 16, CE confirmed that the exceedances were caused by the operation of a rock hammer at the BDRHEF intake crane pad, the same activity that had been carried out over the previous weeks. These two exceedances were the only exceedances caused by construction activities at the BDRHEF intake that were recorded during the spring 2015 monitoring period (May 1 – June 15)	-
	Email, phone conversations	WEL, SES, INX	WEL notified the project team of an active bird nest discovered during TX Line clearing in Segment 11 near structure 285. The active nest was not detected during three consecutive days of AMBNSs conducted prior to the start of clearing. Upon discovery of the nest, clearing was suspended and a no disturbance buffer created. On June 16, when returning to the site to access the buffer, WEL discovered the nest destroyed and the nestlings gone. WEL's QP speculated that a predator destroyed the nest.	-
June 16, 2015	*Kick-off meeting*	CE, SES, INX, Andritz	A kick-off meeting was held for the BDRHEF powerhouse superstructure construction. Site conditions, environmental issues and safety	-

Date	Communication Type	Participants	Issues Discussed	ITM ID No.
			measures were discussed.	
	Email	CE, SES, INX	CE distributed the MSDS (Material Safety Data Sheet) for a tracer dye planned to be used at the ULRHEF sediment basins to assess water infiltration to the upstream tunnel portal.	-
June 17, 2015	*Email*	CE, INX, SES	CE informed INX and SES that they extinguished a fire left by campers who failed to do so. They asked INX to post additional signage to remind the public of the campfire safety regulations.	-
	Email	WEL, SES, INX	WEL notified the project team of an active Red tailed hawk nest discovered ~130m north of structure 229. A 300m no disturbance buffer has been setup around the nest and all works within the buffer (including helicopter flights) have been suspended until further notice.	-
June 17 & 18, 2015	*Email*	SES, MFLNRO, INX, WEL, Ecofish	SES sent a 24hr notification of fish salvage to MFLNRO on June 17, according to the conditions of salvage permit number SU15-167813. Ecofish biologists performed the fish salvage under the supervision of SES. The precautionary fish salvage verified that fish were not present at the Vans creek bridge crossing location prior to commencing bridge works at Vans Creek, which will begin next week.	-
June 18, 2015	*Kick-off meeting*	CE, SES, INX	A kick-off meeting was held for the ULRHEF penstock installation. Site conditions, environmental issues and safety measures were discussed. Additional kick-off meetings will be held on site at environmental hold points as outlined in the work plan.	-
	Email	INX, CE, SES, MFLNRO	INX distributed the MFLNRO works permit for the stringing of the temporary power cable to the ULRHEF intake.	-
	Email	CE, SES, INX	CE notified INX and SES that blasting with ANFO (ammonium nitrate-fuel oil) had commenced in the BDRHEF tunnel and that all ANFO blast generated rock will be place in a designated stockpile. Any use of	-

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	TX Line, ULRHEF, & BDRHEF	Active Migratory Bird Nesting Period	AMBNS must occur prior to clearing vegetation in all Project areas according to the survey schedule and methods outlined in the Project's Active Migratory Bird Nest Survey Plan during the nesting period (May 1 – July 31). All nests identified as active must be protected by a no disturbance

Component	Location	Wildlife/Archeology Concern	Construction/Timing Restrictions & Mitigations
			buffer until the nest is no longer deemed to be active by a QP (buffer distances vary by species and location; further details are provided in the AMBNS Plan).
TX Line	Segments 8 – 15	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 Raptor Nesting Habitat	IEM presence is required when clearing within suitable Northern Goshawk (NOGO), SPOW (Spotted Owl) and Western Screech-Owl (WESO) nesting habitat during the breeding period. A QP is to complete a nest survey if working within 600m of suitable Peregrine Falcon (PEFA) nesting habitat during the breeding period.
		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.
		Wildlife Habitat Area (WHA) 2-399	Construction of the transmission line within the Grizzly Bear WHA 2-399 must be constructed outside of April 1 to June 15 and October 15 to December 31 to minimize disturbance to Grizzly Bears expected to use the WHA during spring and fall.
		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).
		Mountain Goat UWRs	Helicopter flight paths will avoid UWRs and landing locations will be located further than 500m away from the UWRs during the sensitive late winter and kidding period (March 1 – June 15).
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	Noise levels monitoring is occurring near the downstream portal at two monitoring stations within the Truckwash Creek migration route, as well as one location at the ULRHEF intake with guidance from an acoustical consulting firm. If noise levels exceed 75 dBA at the edge of UWR u-2-002 UL 11 or the migration corridor during the critical winter (Nov 1 - Apr 30) and kidding (May 1 - Jun 15) periods, additional

Component	Location	Wildlife/Archeology Concern	Construction/Timing Restrictions & Mitigations
			mitigation measures are to be implemented to minimize noise levels. 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.
ULRHEF & BDRHEF	BDRHEF intake	Mountain Goat UWR habitat (u-2-002 UL 12)	During winter construction and operations (November 1 – June 15), access to Boulder Creek HEF intake must be gated at least 500 m from the original UWR u-2-002 UL 12 to restrict motorized use within the UWR, unless otherwise directed by FLNR. Noise levels are monitored during active construction between May 1 – June 15 within UWR u-2-002 UL 12. The noise level monitoring location is between the intake work area and the portion of the UWR with the highest documented use. If noise levels exceed 75 dBA at this location, activities will cease until additional mitigation measures are proposed and implemented to minimize the possibility of additional noise level exceedances.

4.0 Upper Lillooet River HEF – Monitoring Results

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

Activities:

- Road capping and re-grading at the penstock access road (Photo 1).
- Water trucks applied water for dust suppression along project access roads and the Lillooet River FSR from KM 37.5 to KM 47, throughout the reporting period.
- Routine maintenance of construction equipment within the mechanic shop and fuel management continued at the KM 38 laydown.
- The electric fences were maintained and operational throughout this reporting period.

Environmental Summary:

- Emergency fire suppression equipment was audited by the IEM during this reporting period. Supply boxes were found at all major work areas and the boxes were stocked as per the Fire Preparedness Plan (Photo 2).
- No environmental issues were observed during this reporting period at the construction camp, 38km laydown or on the Lillooet River FSR.

Photos:

Photo 1 – Capping and re-grading at penstock access road (June 17, 2015).

Photo 2 – Fire suppression supplies stored at the ULRHEF intake site (June 18, 2015).

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

Construction Activities:

- Drilling, blasting, excavation and shotcrete stabilization at the upstream tunnel portal excavation (Photo 3 and Photo 4).
- Rebar preparation for intake structure (Photo 4).
- Dewatering of portal excavation to the intake dewatering and wastewater treatment system (Photo 5 and Photo 6).

Environmental Summary:

- Drill and blast works continued at the ULRHEF intake during this reporting period. Drilling and blasting occurred within 500m of the Keyhole Falls Mountain Goat kidding range under the following conditions:
  - Noise suppression measures (delays, minimum charge weights, blast mats, etc.) are used,
  - Noise levels remain below 75 dBA (measured at Keyhole Falls monitoring location), and
  - The blast schedule provided to the IEM in advance to allow for goat monitoring to occur during the blasts.
- A dedicated CE crewmember is present on day shift and night shift to monitor the pumps within the intake structure and tunnel portal excavation during active construction works. This person has the responsibility of directing all turbid water to the sediment ponds and must verify with CE environmental staff or the IEM prior to directing any water to the Lillooet River. When elevated landslide risk forces closure of the intake work site, all seepage water conforming to BCWQGs is directed to the Lillooet River.

- On June 19, the IEM observed oil residue seepage at the oil water separator partition in the ULRHEF intake and upstream tunnel portal sediment basins (Photo 7). The IEM notified CE's environmental management team of the deficiency. On June 20 spill booms were added to the basins and the partition was repaired.
- On June 20, disposable baking pans on wooden stakes were installed around the first cell of the ULRHEF intake and upstream tunnel portal sediment basins as a bird deterrent measure (Photo 8). The IEM and CE's environmental management staff will monitor the site to ensure that the visual deterrents are effective in keeping birds away from the sediment basins.
- The IEM was onsite to monitor all blasts and construction activities within 30m of the Lillooet River.

Photos:

Photo 3 – ULRHEF upstream tunnel portal (June 16, 2015).

Photo 4 – Applying resin to anchor bolts at ULRHEF intake (June 19, 2015).

Photo 5 – ULRHEF intake and upstream tunnel portal sediment basins (June 17, 2015).

Photo 6 – Discharging clean seepage water directly to Lillooet River (June 17, 2015).

Photo 7 – Oil residue visible in ULRHEF intake and upstream tunnel portal sediment basins (June 19, 2015).

Photo 8 – Bird deterrent measures installed at ULRHEF intake and upstream tunnel portal sediment basins (June 20, 2015).

4.3 *Downstream Tunnel Portal*

Construction Activities:

- Drilling, blasting, mucking and stabilization works within the tunnel (Photo 9).
- Dewatering to downstream tunnel portal settling ponds (Photo 10).
- Excavation for new downstream tunnel portal settling ponds at 2+800 (penstock chainage) (Photo 11).

Environmental Summary:

- Tunnelling works and dewatering to the downstream tunnel portal settling ponds continued during this reporting period. The settling pond water infiltrated to ground in the second cell with no discharge to the surrounding environment (Photo 10).
- On June 16, the IEM inspected the site (penstock chainage 2+800) for the new downstream tunnel portal settling ponds (Photo 11). The IEM observed that the ponds were visibly sloped and recommended that CE review the ponds prior to commissioning them. The ponds should be constructed to minimize flow velocity through the ponds, to increase particulate settling efficiency, and promote infiltration. The IEM notified CE's environmental management team who will review the recommendation prior to the commissioning of the ponds.

Photos:

Photo 9 – Current conditions at the ULRHEF downstream tunnel portal (June 16, 2015).

Photo 10 – ULRHEF downstream tunnel portal settling ponds (June 16, 2015).

Photo 11 – New downstream tunnel portal settling pond site on penstock alignment at 2+800 (June 17, 2015).

4.4 *Penstock*

Construction Activities:

- Penstock staging continued (Photo 12).

Environmental Summary:

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

Photos:

Photo 12 – Penstock staged near ASTR04 (June 16, 2015).

4.5 *Powerhouse & Access Road*

Construction Activities:

- Continued rebar installation and formwork for the powerhouse structure (Photo 13).
- Structural concrete pours occurred on June 14 and June 18 (Photo 14).
- Dewatering from the powerhouse sump to the Lillooet River continued (Photo 15).

Environmental Summary:

- On June 14 and 18, the IEM was onsite to inspect the ULRHEF powerhouse and verify WQ within the dewatering sump during a concrete pour (Photo 14). The IEM measured the water in the powerhouse sump to have a pH of 7.3 at 12:45 on June 14 and a pH of 6.9 at 14:30 on June 18. The water quality was suitable for discharge to the surrounding environment as per the Surface Water Quality Protection Plan.
- Dewatering of the ULRHEF powerhouse continued without environmental concern throughout the reporting period. The IEM will continue to monitor the works area to confirm that future concrete pours are adequately isolated from flowing water and protected from precipitation during curing.

Photos:

Photo 13 – Rebar installation and formwork at the ULRHEF powerhouse (June 17, 2015).

Photo 14 – Concrete pour at ULRHEF powerhouse (June 18, 2015).

Photo 15 – ULRHEF powerhouse sump discharging to the Lillooet River (June 18, 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						
June 17, 2015	11:40	ULR Background – ULRHEF Intake	6.7	39.2	53	9.6
	11:57	ULR #0.5 – Downstream of ULRHEF intake at Keyhole Bridge	6.8	38.8	56	9.9
	10:23	ULR # 1 – Upstream of ULRHEF Powerhouse	6.7	39.6	52	9.7
	12:28	ULR #2 – Downstream of ULRHEF Powerhouse between KM 40.5 and KM 41	6.8	37.6	51	10.2
	12:38	ULR #3 – Lillooet River FSR KM 38 Laydown – D/S of Boulder confluence	6.8	34.7	53	10.3
	13:42	ULR #4 – Lillooet River FSR KM 24 – D/S of all works and Meager confluence	6.7	42.8	78	10.6

4.7 *Recommendations*

IEM recommendations for the ULRHEF are as follows:

- All seepage water in the portal excavation should be conveyed to the sediment basins unless approved for discharge directly to the Lillooet River by the IEM or CE environmental manager.
- Recommend that CE review the gradient and elevations of the new infiltration ponds under construction at penstock chainage 2+800. Water velocity through the ponds should be minimized to the extent possible to improve suspended particulate settling ability and to promote infiltration. The IEM notified CE's environmental management team who will review the recommendation prior to the commissioning of the ponds.
- 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 excavation/fill works and rock truck traffic.
- The ULRHEF powerhouse sump water should be monitored regularly. Alkaline or turbid water should be pumped to the remaining 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):

- Drilling and blasting will continue at the ULRHEF intake.
- Dewatering of the upstream portal excavation will continue.
- Tunneling activities will continue at the ULRHEF downstream tunnel portal.
- Penstock installation will commence.
- 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:

- Slope stabilization works continued at the BDRHEF intake and crane pad (Photo 16).

Environmental Summary:

- Noise monitoring continued from a station 375m northwest of the BDRHEF intake within the identified UWR (UL-11). Noise level monitoring was conducted to ensure that the 75 dBA noise level threshold is not exceeded as outlined in the Mountain Goat Management Plan.
- On June 15, BKL notified SES of two noise exceedances recorded at the BDRHEF intake noise monitoring station that occurred at 22:02 on June 11, (duration = 1 second; max = 75.4 dBA, and duration = 2 seconds; max = 78.6 dBA). On June 16, CE confirmed that the exceedances were caused by the operation of a rock hammer at the BDRHEF intake crane pad, conducting the same activity that had been carried out over the previous weeks. These two exceedances were the only exceedances caused by construction activities at the BDRHEF intake that were recorded during the spring 2015 monitoring period (May 1 – June 15). Noise monitoring concluded with the end of the sensitive late spring Mountain Goat kidding period on June 15.
- The gate to restrict public access on the BDRHEF intake access road within 500m of UWR was operated until the end of the sensitive late spring Mountain Goat kidding period (June 15).

Photos:

Photo 16 – Conditions at BDRHEF intake following blast above crane pad (June 16, 2015).

5.2 *Downstream Tunnel Portal and Powerhouse*

Construction Activities:

- Preparation and cleaning for superstructure construction (Photo 17).
- Drilling, blasting, mucking and stabilization works continued within the tunnel (Photo 18).
- Dewatering of the tunnel and powerhouse to the oil water separator and settling ponds continued (Photo 19).

Environmental Summary:

- No environmental issues were observed during this reporting period at the BDRHEF downstream tunnel portal and powerhouse.

Photos:

Photo 17 – Current conditions at the BDRHEF powerhouse (June 17, 2015).

Photo 18 – BDRHEF downstream tunnel portal (June 17, 2015).

Photo 19 – BDRHEF downstream tunnel portal and powerhouse settling ponds (June 17, 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						
June 17, 2015	-	**BDR BG** – Upstream of BDRHEF intake *not currently accessible*	-	-	-	-
	-	**BDR #1** – Downstream of BDRHEF intake *not currently accessible*	-	-	-	-
	10:42	**BDR #2** – Upstream of BDRHEF Powerhouse	6.9	21.0	24	8.3
	10:18	**BDR #3** – Downstream of BDRHEF Powerhouse at Pebble Creek Bridge	7.0	25.0	24	8.3

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.
- CE should continue to exercise caution when working at the BDRHEF crane pad and on slope consolidation to prevent excessive rock fall into Boulder Creek.

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):

- Scaling and stabilization works on the BDRHEF intake right bank will continue.
- Rock hammering and excavation at the intake will continue.
- Blasting works will continue at the intake.
- BDRHEF downstream portal tunnelling works will continue.
- Superstructure construction will commence.

6.0 Transmission Line – Monitoring Results

6.1 *Transmission Line Construction Activities*

Right-of-Way Clearing:

- Hand falling in Segment 11.
- Slashing in Segment 12.

Existing Road Upgrades and Access Road Construction

- Helipad clearing and construction in Segment 9b.
- Road construction in Segment 11 (Photo 20), 13 and 14.

Transmission Line Pole Installation, Line Stringing and Clipping

- Framing in Segment 4.
- Stringing, pulling and clipping conductors in Segment 7 (Photo 21).
- Groundworks for pole foundations in Segment 9a.

Environmental Summary:

- On June 18, the IEM was present for a precautionary fish salvage conducted by Ecofish at Vans Creek. No fish were captured or observed during the salvage works. One CTF was observed but due to stream conditions (high velocity and volume), a frog salvage was deemed to be impractical and unsafe. Mitigation for the bridge removal works will involve minimizing sedimentation and IEM monitoring of all instream works.
- 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.

Photos:

Photo 20 – Ditching and road works on Ryan South Main near stream 261a (June 18, 2015).

Photo 21 – Pole stringing in Segment 7 (June 20, 2015).

Photo 22 – Ecofish perform precautionary fish salvage at Vans Creek (June 18, 2015).

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*

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

- Groundworks for pole foundations and stringing conductor in Segment 3.

- Conductor stringing in Segment 4.
- Removal of the existing Vans Creek bridge and installation of a new bridge in Segment 11.
- Road construction in Segment 11, 13 and Segment 14.
- Helipad construction and hand clearing in Segment 9b.

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 for work activities within the Migration Corridor and within UWR habitat buffers included:

- Noise level monitoring occurred daily (from May 1 - June 15) to ensure that the 75db noise level threshold is not exceeded as outlined in the Mountain Goat Management Plan.
- As of May 1 and until June 15, 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 three 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).

Monitoring effort was split between all three sites between sunrise and sunset, unless safety concerns or weather conditions precluded monitors from doing so. The order of site visits rotated daily. Construction activities need to 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.

Please refer to the attached Mountain Goat Monitoring Daily Observation Forms for a summary of observations from this reporting 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
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)							

Mountain Goat Daily Observation Form

UPPER LILLOOET HYDRO PROJECT

Goat Monitor's Name(s): Anne Sutherland

Date (YYYY-MM-DD): 2015-06-14

Weather (*cloud cover,* precipitation *and temperature*): Sunny, 10% cloud, light wind, 22 C

sartori environmental services

106-185 forester street, north vancouver, bc v7h 0a6
office tel 987.5588 fax 987.7740

Please submit **Mountain Goat Daily Observation Form** in person to a representative of Sartori Environmental Services (**Tom Hicks** or **Stephen Sims**) or by email to **tom@sartorienv.com** following each day of monitoring.

Mountain Goat Observation Site	UWR/Migration Corridor - Location	UTM Coordinates *(approximate center of observation area)*	Daily Start Time *(24hr clock)*	Daily End Time *(24hr clock)*
MG - OBS01	Migration Corridor - East side of Truckwash Creek	10U 467898 5612845	08h45	11h15
MG - OBS02	UWR u-2-002 UL 11 - Keyhole Falls	10U 466760 5613967	14h05	16h00
MG - OBS03	UWR u-2-002 UL 19 - Garibaldi Pumice	10U 469155 5614960	11h30	13h30

Daily form #	1	of	1

If more space is needed in the below table, please fill out additional daily forms and indicate total number of forms above.

Observation Site *(indicate if location other than OBS site)*	Time *(use 24hr clock)*	UTM Coordinates or Waypoint *(10U)*	Species Observed *(indicate Mountain Goat or other species)*	Observations *(be specific - visual sign, track, other sign)*	Total # of Animals	Age/Sex *(if unknown - refer to attached info sheet)*	Description of Activities *(feeding, moving, etc.)*	Comments *(habitat, snow conditions, etc.)*	Photo #s
MG - OBS01	10h30-10h47	467898 5612845	MG	Visual	2	Adult To far away to sex	Feeding by a waterfall just below the snow line. Grazed for a while then one lay down in sun but got up and moved into bushy area.	On meager mtn side. Located in the red rock area . Commonly spot goats in this area. Still have full winter coat.	
MG - OBS03	13h00	469155 5614967	N/a	N/a	N/a	N/a	N/a	N/a	
MG - OBS02	14h30	466760 5613967	N/a	N/a	N/a	N/a	N/a	N/a	

Mountain Goat Daily Observation Form

UPPER LILLOOET HYDRO PROJECT

Goat Monitor's Name(s): Anne Sutherland

Date (YYYY-MM-DD): 2015-06-15

Weather (*cloud cover*, precipitation *and temperature*): Sunny and hot in pm

sartori environmental services

106-185 forester street, north vancouver, bc v7h 0a6
office tel 987.5588 fax 987.7740

Please submit **Mountain Goat Daily Observation Form** in person to a representative of Sartori Environmental Services (**Tom Hicks** or **Stephen Sims**) or by email to **tom@sartorienv.com** following each day of monitoring.

Mountain Goat Observation Site	UWR/Migration Corridor - Location	UTM Coordinates *(approximate center of observation area)*	Daily Start Time *(24hr clock)*	Daily End Time *(24hr clock)*
MG - OBS01	Migration Corridor - East side of Truckwash Creek	10U 467898 5612845	11h00	13h00
MG - OBS02	UWR u-2-002 UL 11 - Keyhole Falls	10U 466760 5613967	14h30	16h30
MG - OBS03	UWR u-2-002 UL 19 - Garibaldi Pumice	10U 469155 5614960	07h30	10h30

Daily form #	1	of	1

If more space is needed in the below table, please fill out additional daily forms and indicate total number of forms above.

Observation Site *(indicate if location other than OBS site)*	Time *(use 24hr clock)*	UTM Coordinates or Waypoint *(10U)*	Species Observed *(indicate Mountain Goat or other species)*	Observations *(be specific - visual sign, track, other sign)*	Total # of Animals	Age/Sex *(if unknown - refer to attached info sheet)*	Description of Activities *(feeding, moving, etc.)*	Comments *(habitat, snow conditions, etc.)*	Photo #s
MG - OBS03	10h15	469155 5614960	N/a	N/a	N/a	N/a	N/a	No goats observed	
MG - OBS01	12h50	467898 5612845	N/a	N/a	N/a	N/a	N/a	No goats observed	
MG - OBS02	16h40	466760 5613967	N/a	N/a	N/a	N/a	N/a	No goats observed. Blast at 16h35	