


Upper Lillooet Hydro Project

Weekly Environmental Monitoring Report #71

Reporting Period: August 30 – September 12, 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)

Distribution List		Prepared By
Name	Organization	
Herbert Klassen	Fisheries and Oceans Canada	 J. Alex Sartori, RPBio <i>Independent Environmental Monitor (IEM)</i>
James Davies	MFLNRO – Water Allocation	
Danielle Cunningham	MFLNRO – Land and Resources	
Frank DeGagne	MFLNRO – Land and Resources	
Nathan Braun	BC Environmental Assessment Office	
George Steeves	True North Energy – Independent Engineer	
Jennifer McCash	JEM Energy Ltd. – Independent Engineer	
Thomas Hicks	Sartori Environmental Services	
Peter Ramsden	Innergex Renewable Energy Inc.	
Oliver Robson	Innergex Renewable Energy Inc.	
Grant Lindemulder	Innergex Renewable Energy Inc.	
Josh Zandbergen	Innergex Renewable Energy Inc.	
Julia Mancinelli	Innergex Renewable Energy Inc.	
Liz Scroggins	Innergex Renewable Energy Inc.	
Bas Brusche	Innergex Renewable Energy Inc.	
Matt Kennedy	Innergex Renewable Energy Inc.	
Renaud DeBatz	Innergex Renewable Energy Inc.	
Richard Blanchet	Innergex Renewable Energy Inc.	
Dara McDermott	Innergex Renewable Energy Inc.	
Yannick Tardif	CRT-ebc Construction Inc.	
Jonathan Drapeau	CRT-ebc Construction Inc.	
Éric Ayotte	CRT-ebc Construction Inc.	
Jean Pelletier	CRT-ebc Construction Inc.	
Jordan Gagne	CRT-ebc Construction Inc.	
Ian McKeachie	CRT-ebc Construction Inc.	
D'Arcy Soutar	Westpark Electric Ltd.	
Pontus Lindgren	Westpark Electric Ltd.	Date Prepared: October 19, 2015 Date Submitted: October 22, 2015
Harriet VanWart	Lil'wat Nation	

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, 8) No. L49717
 Occupant Licence to Cut (BDRHEF – KM 38 laydown) No. L49698
 Occupant Licence to Cut (BDRHEF Amendments 1, 2, 3, 4) 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; 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 - Boulder Powerhouse Foundations, Stage 2, & Septic System Installation (10865) July 20, 2015
 SLRD Building Permit – Upper Lillooet Powerhouse Foundations & Septic System Installation (10864) July 20, 2015

ACRONYMS:

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

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
August 30 – September 5	SE, VD	Intermittent rain throughout week	<p>Construction Camp, Laydown Areas and the Lillooet River FSR</p> <ul style="list-style-type: none"> • Road maintenance on the Lillooet River FSR and camp access road • Scaling and hazard tree removal at KM 41 on the Lillooet River FSR <p>ULRHEF Intake</p> <ul style="list-style-type: none"> • Clean-up and site preparation works • Dewatering to sediment basins <p>ULRHEF Downstream Tunnel Portal</p> <ul style="list-style-type: none"> • Drilling, blasting and tunnel stabilization <p>ULRHEF Penstock</p> <ul style="list-style-type: none"> • Excavation, installation, welding and backfill from 2+900 to 3+900 <p>ULRHEF Powerhouse</p> <ul style="list-style-type: none"> • Clean-up and preparation works <p>BDRHEF Intake, Crane Pad and Access Road</p> <ul style="list-style-type: none"> • Road maintenance and slope stabilization works at KM 3.5 – 4.5 <p>BDRHEF Downstream Tunnel Portal</p> <ul style="list-style-type: none"> • Drilling, blasting and tunnel stabilization <p>BDRHEF Powerhouse</p> <ul style="list-style-type: none"> • No activity <p>TX-Line</p> <ul style="list-style-type: none"> • Segment 9B <ul style="list-style-type: none"> ➢ Groundworks including blasting • Segment 11 <ul style="list-style-type: none"> ➢ Road construction; temporary culvert installed to cross stream 272a following CTF salvage. • Segment 12 <ul style="list-style-type: none"> ➢ Miller Bench permanent crossing works at MB53 and MB59
September 6 – 12	SE, BA, VD	Overcast/rain becoming clear Sept. 10	<p>Construction Camp, Laydown Areas and the Lillooet River FSR</p> <ul style="list-style-type: none"> • Scaling and hazard tree removal on the Lillooet River FSR at KM 41 • Removal and re-installation of box culvert on the magazine access road <p>ULRHEF Intake</p> <ul style="list-style-type: none"> • Drilling and tunnel stabilization <p>ULRHEF Downstream Tunnel Portal</p> <ul style="list-style-type: none"> • Drilling, blasting and tunnel stabilization <p>ULRHEF Penstock</p> <ul style="list-style-type: none"> • Excavation, installation, welding and backfill from 2+900 to 3+900 <p>ULRHEF Powerhouse</p> <ul style="list-style-type: none"> • Rebar and formwork installation • Structural concrete pours <p>BDRHEF Intake, Crane Pad and Access Road</p> <ul style="list-style-type: none"> • Excavation and blasting at crane pad • Consolidation and stabilization works above diversion tunnel <p>BDRHEF Downstream Tunnel Portal</p> <ul style="list-style-type: none"> • Drilling, blasting and tunnel stabilization <p>BDRHEF Powerhouse</p> <ul style="list-style-type: none"> • No activity <p>TX-Line</p>

Date	IEM Team Personnel	Weather Conditions	Key Monitoring Locations & Activities
			<ul style="list-style-type: none"> • Segment 6 <ul style="list-style-type: none"> ➢ Backfill and pole straightening • Segment 9B <ul style="list-style-type: none"> ➢ Groundworks including blasting • Segment 11 <ul style="list-style-type: none"> ➢ Road construction including culvert installations • Segment 12 <ul style="list-style-type: none"> ➢ Helicopter access logging at structures 281 – 283 ➢ Miller Bench permanent crossing works at MB58 and MB59 • Segment 13 <ul style="list-style-type: none"> ➢ Helicopter access logging at structures 316 – 317

IEM Team Personnel: TH – Tom Hicks; SS – Stephen Sims; BA – Blake Aleksich; VD – Vanessa Dan; AA – Anthony Andrews; 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.
August 30	<i>Email</i>	JEM, MFLNRO, SES, INX	The IE distributed the site inspection report for the June inspection. There were no IE inspections conducted in July or August due to the closure of the ULHP site because of the Boulder Creek Wildfire.	-
	<i>Kick-off meeting</i>	SES, CE	A kick-off meeting was held onsite to discuss safety, engineering and environmental concerns for the BDRHEF septic systems and waterline construction.	-
	<i>Email</i>	INX, CE, WEL, SES	INX distributed the Post-Fire Air Monitoring and Workplace Exposure Assessment Report prepared by CE.	-
September 2	<i>Kick-off meeting</i>	SES, CE	A kick-off meeting was held onsite to discuss safety, engineering and environmental concerns for the post-wildfire scaling works at KM 41 on the Lillooet River FSR.	-
	<i>Kick-off meeting</i>	SES, CE	A kick-off meeting was held onsite to discuss safety, engineering and environmental concerns for the Truckwash Creek penstock crossing clearing works.	-
September 3	<i>Kick-off meeting</i>	SES, CE	A kick-off meeting was held onsite to discuss safety, engineering and environmental concerns for the spoil area at KM 3 on the Boulder Creek access road.	-
	<i>Email</i>	INX, CE, SES	INX distributed OLTC L49816 Amendment #4 and OLTC L49717 Amendment #8.	-
September 3-4	<i>Emails</i>	CE, INX, SES, MFLNRO	CE requested guidance and approval for the construction of an access road to the penstock alignment at KM 42 on the Lillooet River FSR. CE and INX agreed upon a location and conditions for construction, developed a plan and submitted the plan to MFLNRO for approval, which they granted.	-
September 4	<i>Email</i>	JEM, INX, CE, SES, FLNRO, MOE	JEM distributed the LTC for the BDRHEF powerhouse turbine and generator installation.	-

Date	Communication Type	Participants	Issues Discussed	ITM ID No.
September 9	Email	INX, CE, SES	INX distributed the LTC for the magazine road log box culvert installation.	
September 11	Email	SES, CE, INX	SES addressed the issue of spoiling the penstock sandblasting waste material on site. SES confirmed with CE that sandblasting material was considered contaminated waste and was to be disposed of offsite at an approved facility.	

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 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 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 Update - Boulder Creek Wildfire Complex (V30241)

On July 4, 2015, the Squamish Lillooet Regional District (SLRD) at the recommendation of the BC Wildfire Services issued an Evacuation Order due to the “Boulder Creek” fire (V30241) that was ignited by lightning on June 30, 2015 (approximately 3 km upstream of our Boulder Creek Intake area). All personnel were safely evacuated from the ULHP construction site on July 4, prior to the fire sweeping through the Project area on July 5, 2015.

On July 22, 2015 the SLRD Evacuation Order was rescinded and a BC Wildfire Services Area Restriction Order issued for the Lillooet River FSR and South Lillooet River took effect on July

23, 2015. Due to elevated fire risk, the Exemption Approval allowing project personnel temporary access to the project site under the Area Restriction Order was rescinded on July 30, 2015.

On August 11, 2015, the BC Wildfire Service amended the Area Restriction Order restricting access beyond the 9km gate on the Lillooet River FSR and beyond the South Creek Bridge along the South Lillooet FSR. Coastal Fire Service issued an Exemption Approval to the Order on August 12, 2015 allowing project work to resume while the Area Restriction Order remained in effect.

On August 21, 2015, the BC Wildfire Services amended the Area Restriction Order restricting access beyond the KM 37.5 check-in attendant booth on the Lillooet River FSR. The ULRHEF and BDRHEF remained restricted to the public throughout the monitoring period; however, Project personnel were granted permission to enter the Restricted Area under written authorization from the BC Wildfire Service. Unrestricted access to Segments 6 & 7 of the TX Line was restored as part of the amended Area Restriction Order.

5.0 Upper Lillooet River HEF – Monitoring Results

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

Activities:

- Maintenance work on the camp access road (Photo 1).
- Scaling and danger tree removal at KM 41 on the Lillooet River FSR (Photo 3).
- Routine maintenance of construction equipment within the mechanic shop and fuel management continued at the KM 38 laydown.
- The electric fences surrounding the construction camp were maintained and operational throughout this reporting period.

Environmental Summary:

- On September 2, a kick-off meeting was held to discuss safety, environmental and engineering concerns for the KM 41 scaling and danger tree removal works (Photo 2).
- On September 11 and 12, the IEM was present for a log box culvert removal and re-installation at a fish-bearing stream that crosses the magazine access road (stream 9a near KM 0.25 on the BDRHEF intake access road). An Ecofish crew conducted a fish salvage prior to works and during dewatering (Photo 4). Worksite isolation was achieved with a sandbag berm and pump method and works were completed in the absence of flowing water (Photo 5 and Photo 6). During the culvert installation works, three temporary pulses of suspended sediment were experienced downstream. One pulse occurred when the sandbag berm was built to create a sump within the isolated work area (Sept. 12, 09:42), a second pulse occurred when the old sill logs were removed (Sept. 11, 15:50) and a third pulse occurred when water was released to the culvert (Sept. 12, 11:07). The IEM conducted water sampling during works. See Section 5.6 for water quality results.

Photos:



Photo 1 – Maintenance work on camp access road (September 2, 2015).



Photo 2 – Kick-off meeting held for scaling and danger tree removal works at KM 41 on the Lillooet River FSR (September 2, 2015).



Photo 3 – Scaling and danger tree removal works at KM 41 of the Lillooet River FSR (September 3, 2015).



Photo 4 – Fish salvage conducted by Ecofish prior to installation of log box culvert (September 11, 2015).



Photo 5 – Sandbag berm and pumps used to isolate box culvert work area from water (September 11, 2015).



Photo 6 – Installation of the log box culvert on the magazine access road (September 12, 2015).

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

Construction Activities:

- Clean-up and site preparation work continued at the ULRHEF intake (Photo 7).
- Repairs to the tunnel ventilation and electrical systems commenced to allow for the re-activation of the tunneling activities at the upstream tunnel portal.
- Repair and installation of the ULREHF intake dewatering system (Photo 8 and Photo 9).

Environmental Summary:

- The intake dewatering system was repaired and reconfigured during this reporting period (Photo 8). A sump box was installed at the entrance to the upstream tunnel portal to collect seepage water from the intake excavation and inside the tunnel (Photo 9). Clean seepage water was actively pumped directly to the Lillooet River throughout the reporting period (Photo 10).

Photos:



Photo 7 – Current conditions at the ULRHEF intake (September 2, 2015).



Photo 8 – ULRHEF intake dewatering system repair works (September 2, 2015).



Photo 9 – Sump box and pumps installed at entrance to upstream tunnel portal (September 12, 2015).



Photo 10 – Dewatering intake work area to Lillooet River (September 12, 2015).

5.3 Downstream Tunnel Portal

Construction Activities:

- Drilling, blasting, mucking and stabilization works within the tunnel (Photo 11).
- Dewatering to downstream tunnel portal settling ponds (Photo 12).

Environmental Summary:

- Tunnelling works and dewatering to the downstream 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 12).

Photos:



Photo 11 – Current conditions at the ULRHEF downstream tunnel portal (September 7, 2015).



Photo 12 – ULRHEF downstream tunnel portal infiltration ponds (September 7, 2015).

5.4 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:

- On September 2, a kick-off meeting was held for the Truckwash Creek crossing clearing works. Site conditions, safety concerns and environmental issues were discussed (Photo 15).

Photos:



**Photo 13 – Penstock backfill works
(September 7, 2015).**



**Photo 14 – Penstock welding at 3+750
(September 2, 2015).**



**Photo 15 – Kick-off meeting for Truckwash Creek penstock
crossing clearing works (September 2, 2015).**

5.5 Powerhouse & Access Road

Construction Activities:

- Clean-up and site preparation works (Photo 16 and Photo 17).
- Formwork and rebar installation.
- Structural concrete pours on September 7, 11 and 12 (Photo 18).

Environmental Summary:

- On September 7, 11 and 12, the IEM was onsite to inspect the ULRHEF powerhouse during structural concrete pours (Photo 18). The IEM conducted water quality sampling of the powerhouse sump discharge (Photo 19). 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 5.6 for Water Quality Results).



Photo 16 – Current conditions at the ULRHEF powerhouse (September 2, 2015).



Photo 17 – Clean-up and site preparation at the ULRHEF powerhouse (September 2, 2015).



Photo 18 – Concrete pour at ULRHEF powerhouse (September 7, 2015).



Photo 19 – Dewatering powerhouse sump to Lillooet River (September 7, 2015).

5.6 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 (µS)	Temp (°C)
Routine Water Quality						
September 3, 2015	13:50	ULR Background – ULRHEF Intake	7.4	57.6	53	5.8
	13:39	ULR #0.5 – Downstream of ULRHEF intake at Keyhole Bridge	7.3	66.7	88	6.0
	14:43	ULR # 1 – Upstream of ULRHEF Powerhouse	7.2	64.0	54	6.3
	15:11	ULR #2 – Downstream of ULRHEF Powerhouse between KM 40.5 and KM 41	7.5	62.7	54	6.4
	16:05	ULR #3 – Lillooet River FSR KM 38 Laydown – D/S of Boulder confluence	7.5	59.5	56	6.7
	20:00	ULR #4 – Lillooet River FSR KM 24 – D/S of all works and Meager confluence	7.6	33.0	71	6.3
September 12, 2015	15:00	ULR Background – ULRHEF Intake	7.1	53.9	40	8.5
	15:30	ULR #0.5 – Downstream of ULRHEF intake at Keyhole Bridge	7.1	62.1*	41	9.8
	13:47	ULR # 1 – Upstream of ULRHEF Powerhouse	7.4	58.6	47	7.7
	16:02	ULR #2 – Downstream of ULRHEF Powerhouse between KM 40.5 and KM 41	7.1	61.4	43	9.1
	8:49	ULR #3 – Lillooet River FSR KM 38 Laydown – D/S of Boulder confluence	7.5	55.1	42	5.1
	17:05	ULR #4 – Lillooet River FSR KM 24 – D/S of all works and Meager confluence	7.8	62.0*	41	10.0
Log Box Culvert Installation on Magazine Access Road						
September 11	7:55	Background	-	0.4	-	-
	9:42	10m downstream of culvert installation	-	14.7	-	-
	10:00	10m downstream of culvert installation	-	11	-	-
	10:15	10m downstream of culvert installation	-	6.08	-	-

Date	Time	Sample Location Description	pH	Turbidity (NTU)	Cond (µS)	Temp (°C)
	12:27	10m downstream of culvert installation	-	2.33	-	-
	15:50	10m downstream of culvert installation	-	65	-	-
	15:55	10m downstream of culvert installation	-	26	-	-
	16:20	10m downstream of culvert installation	-	4.67	-	-
September 12	10:25	Background	-	1.14	-	-
	10:40	10m downstream of culvert installation	-	37	-	-
	10:50	10m downstream of culvert installation	-	7.03	-	-
	11:07	10m downstream of culvert installation	-	603AU	-	-
	11:20	10m downstream of culvert installation	-	35.8	-	-
	11:30	10m downstream of culvert installation	-	7.93	-	-
ULRHEF Powerhouse Concrete Pours						
September 7, 2015	11:40	Outlet of 10" powerhouse dewatering hose	6.8	-	-	-
	11:55	Outlet of 10" powerhouse dewatering hose	6.9	-	-	-
September 12, 2015	13:35	ULRHEF powerhouse settling pond	6.7	-	-	-

5.7 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.
- The ULRHEF powerhouse sump water should be monitored regularly. Alkaline or turbid water should be pumped to the settling ponds for treatment.

5.8 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 re-commence 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.

6.0 Boulder Creek Hydroelectric Facility – Monitoring Results

6.1 Intake Access Road & Crane Pad

Construction Activities:

- Slope consolidation works were conducted upslope of the BDRHEF access road from KM 3.5 – 4.5 (Photo 20).
- Scaling and consolidation works on right bank above diversion tunnel.
- Excavation and blasting for ramp construction at BDRHEF intake (Photo 21).

Environmental Summary:

- No environmental issues were observed or reported at the BDRHEF intake during this reporting period.

Photos:



Photo 20 – Slope consolidation works on BDRHEF intake access road (September 2, 2015).



Photo 21 – Preparation for blasting and excavation of ramp at BDRHEF intake (September 10, 2015).

6.2 Downstream Tunnel Portal and Powerhouse

Construction Activities:

- Drilling, blasting, mucking and stabilization works re-commenced within the tunnel (Photo 22).
- Dewatering of the tunnel and powerhouse to the oil water separator and settling ponds continued (Photo 23).

Environmental Summary:

- All wastewater related to the BDRHEF tunnelling works continued to be contained and conveyed to the downstream portal settling ponds for treatment (Photo 23). The water in

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

Photos:



Photo 22 – BDRHEF downstream portal entrance and powerhouse structure (September 7, 2015).



Photo 23 – BDRHEF downstream portal settling ponds (September 7, 2015).

6.3 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						
September 3, 2015	-	BDR BG – Upstream of BDRHEF intake *not currently accessible*	-	-	-	-
	-	BDR #1 – Downstream of BDRHEF intake *not currently accessible*	-	-	-	-
	15:37	BDR #2 – Upstream of BDRHEF Powerhouse	7.5	41.1	50	6.2
	15:50	BDR #3 – Downstream of BDRHEF Powerhouse at Pebble Creek Bridge	7.4	38.8	52	6.4
September 12, 2015	-	BDR BG – Upstream of BDRHEF intake *not currently accessible*	-	-	-	-
	-	BDR #1 – Downstream of BDRHEF intake *not currently accessible*	-	-	-	-
	16:25	BDR #2 – Upstream of BDRHEF Powerhouse	7.6	37.0	33	10.1
	16:37	BDR #3 – Downstream of BDRHEF Powerhouse at Pebble Creek Bridge	7.6	43.0	25	10.1

6.4 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.

6.5 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 at the intake.
- BDRHEF downstream portal tunnelling works will continue.
- Superstructure construction will continue.

7.0 Transmission Line – Monitoring Results

7.1 Transmission Line Construction Activities

Right-of-Way Clearing:

- RVMA clearing from structures 272 – 273 in Segment 11.
- Helicopter access logging from structures 281 – 283 and 316 – 317 in Segment 12 and 13.

Existing Road Upgrades and Access Road Construction

- Road construction upgrades on South Ryan Road in Segment 6.
- Road construction including culvert installations in Segment 11 (Photo 24 and Photo 25).
- Permanent crossing/bridge construction works on Miller Bench FSR in Segment 12 (Photo 26 and Photo 27).

Transmission Line Pole Installation, Line Stringing and Clipping

- Groundworks for pole foundations in Segment 9B and 14.
- Pole installations in Segment 6.

Environmental Summary:

- On September 4, the IEM was present for a culvert installation at stream 272A in Segment 11. Stream 272A is an identified CTF watercourse. An Ecofish crew conducted a salvage prior to works and during dewatering (Photo 24). Worksite isolation was achieved with dam/sump and pump methods and works were completed in the absence of flowing water (Photo 25). During the culvert installation works, two pulses of suspended sediment were recorded downstream of the works which temporarily exceeded BCQWGs. The first pulse occurred during the installation of an earth berm installed to pool water and allow for the proper function of a diversion pump within the isolated work area (09:30) and a second

pulse occurred when water was released to the culvert (13:05). In both instances, the contractor worked diligently to reduce the amount of suspended sediment as quickly as possible. The IEM conducted water sampling during works. See Section 7.2 for water quality results.

- The IEM was onsite to monitor permanent crossing/bridge construction works on the Miller Bench FSR at MB53, MB58 and MB59 (Photo 26, Photo 27 and Photo 28). The high water mark was clearly flagged at all crossings and works were completed in the dry with no effect on the surrounding watercourses. The IEM conducted water sampling during works and observed and measured no effect on downstream water quality.
- 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 24 – Ecofish crew conduct Coastal Tailed Frog salvage prior to works at Stream 272A (September 4, 2015).



Photo 25 – Culvert installation with isolation in place at Stream 272A (September 4, 2015).



Photo 26 – Preparation for installation of precast footings and steel columns at MB53 (September 1, 2015).



Photo 27 – Bridge installation works at MB59 (September 4, 2015).



Photo 28 – Bridge installed at MB59 (September 7, 2015).

7.2 Water Quality Results

The following table presents water quality conducted during instream works. 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.

Date	Time	Sample Location Description	pH	Turbidity (NTU)	Cond (uS)	Temp (°C)
Culvert Installation at Stream 272A in Segment 11						
September 4, 2015	9:00	BG upstream of works	-	1.68	-	-
	9:30	5m downstream of culvert location	-	95	-	-
	9:55	5m downstream of culvert location	-	51	-	-
	10:35	5m downstream of culvert location	-	22.6	-	-
	11:55	5m downstream of culvert location	-	4.51	-	-
	12:05	5m downstream of culvert location	-	5.81	-	-

Date	Time	Sample Location Description	pH	Turbidity (NTU)	Cond (uS)	Temp (°C)
	12:20	5m downstream of culvert location	-	3.31	-	-
	12:50	5m downstream of culvert location	-	7.15	-	-
	13:05	5m downstream of culvert location	-	42	-	-
	13:20	5m downstream of culvert location	-	9.16	-	-
	13:35	5m downstream of culvert location	-	1.27	-	-

7.3 Recommendations

- The IEM has no recommendations at this time.

7.4 Upcoming Works

- Pole installations in Segment 6.
- Permanent crossing works and road upgrades in Segment 11.
- Road construction in Segment 13.
- Heli-logging in Segment 11.
- Ground works and bridge installation in Segment 14.

8.0 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

Wildlife sightings reported in August 2015 by the Owner, contractors, and IEM team, are included in the following table.

Date	Time	Observer (Company)	Species or Description	Location
2015-08-27	14:30	Greg Davis	Black Bear	46.5 KM Lillooet River FSR
2015-08-28	8:30	J M Pelletier	Coyote	37.8 KM Lillooet River FSR
2015-08-31	10:30	Stephanie Ellis	Black Bear	32 KM Lillooet River FSR

9.0 Mountain Goat Monitoring Program

Noise monitoring and daily mountain goat monitoring will resume in October 2015.

To mitigate potential impacts to mountain goats during the summer months, Construction activities will cease if a mountain goat(s) is (are) observed moving towards the ULRHEF intake and/or if a mountain goat(s) 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.

10.0 Environmental Issues Tracking Matrix (ITM)

10.1 Hydroelectric Facilities (ULRHEF & BDRHEF)

ITM Tracking Legend:		<i>Work Item Open</i>		Mitigation Measures			
		<i>Work Item Complete</i>					
		<i>Issue Closed</i>					
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 – ULR#25)</i>							

10.2 Transmission Line

ITM Tracking Legend:		<i>Work Item Open</i>		Mitigation Measures			
		<i>Work Item Complete</i>					
		<i>Issue Closed</i>					
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>							