



Upper Lillooet Hydro Project

Weekly Environmental Monitoring Report #35

Reporting Period: August 17th – August 23rd, 2014

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)
Fisheries Act Subsection 35(2)(b) Authorization No. 09-HPAC-PA2-000303 (Amendment 1)
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) No. L49717
Occupant Licence to Cut (BDRHEF – km 38 laydown) No. L49698
Occupant Licence to Cut (BDRHEF Amendments 1, 2) No. L49816
Occupant Licence to Cut (TX Line Amendment 1, 2, 3, 4) 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
Works Permit for Construction within FSR Right-of-Way No. 6123-14-01
Section 52(1)(b) FRPA Authorization for Ryan River Wet Crossing File No. FOR-19400-01/2014

Contractor Construction Permits and Approvals

*Magazine Licence File No. UL76018
 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
 Wildlife Act Permits – Pacific Tailed Frog Salvage Permit # SU14-95304 &SU13-90538, Fish Salvage Permit # SU14-95329
 Section 52 of the Fisheries (General) Regulations – Fish Salvage Licence #XR 139 2014
 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)
 Lillooet South FSR Temporary Road Closures Approval File No. 11250-32/7977*

ACRONYMS:

AMBNS	Active Migratory Bird Nesting Survey	IEM	Independent Environmental Monitor
ASMP	Archaeological Sites Management Plan	Innergex	Innergex Renewable Energy Inc.
ARD/ML	Acid Rock Drainage and Metal Leaching	ITM	Environmental Issue Tracking Matrix
BCEAO	British Columbia Environmental Assessment Office	JEM	JEM Energy Ltd. (Delegate Independent Engineer)
BCWQG	British Columbia Water Quality Guidelines	LTC	Leave to Construct
BDRHEF	Boulder Creek Hydroelectric Facility	MFLNRO	Ministry of Forests, Lands and Natural Resource Operations
BG	Background	MOE	Ministry of Environment
BKL	BKL Consultants Ltd.	NCD	Non Classified Drainage
CRT-ebc	CRT-ebc Construction Inc.	OLTC	Occupational License to Cut
DFO	Fisheries and Oceans Canada	PAG	Potentially Acid Generating
DS	Downstream	RoW	Right of Way
Ecofish	Ecofish Research Ltd.	RVMA	Riparian Vegetation Management Area
Ecologic	Ecologic Consulting	SES	Sartori Environmental Services
EDI	Environmental Dynamics Inc.	TX Line	Transmission Line
EIR	Environmental Incident Report	ULRHEF	Upper Lillooet River Hydroelectric Facility
ESC	Erosion and Sediment Control	UWR	Ungulate Winter Range
FAM	Field Advice Memorandum	VC	Valued Component
FSR	Forest Service Road	WQ	Water Quality
GWR	Mountain Goat Winter Range	WEL	Westpark Electric Ltd.
Hedberg	Hedberg and Associates Ltd.	WEMR	Weekly Environmental Monitoring Report
IE	Independent Engineer (True North Energy)		

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	Monitoring Locations & Key On-site Environmental Information
Sunday August 17	DA, VD	Sun and Cloud	<p><i>BDRHEF Tunnel Portal</i></p> <ul style="list-style-type: none"> • Drilling, blasting and stabilization of the tunnel • Seepage from tunnel pumped from sump at portal entrance into settling ponds <p><i>BDRHEF Powerhouse</i></p> <ul style="list-style-type: none"> • Parking enlargement and powerhouse frameworks <p><i>BDRHEF Intake Access Road</i></p> <ul style="list-style-type: none"> • Continued road construction <p><i>ULRHEF Downstream Portal</i></p> <ul style="list-style-type: none"> • Drilling, blasting and stabilization of the tunnel • Seepage from tunnel pumped from sump at portal entrance into settling ponds <p><i>ULRHEF Powerhouse</i></p> <ul style="list-style-type: none"> • Backfilling powerhouse foundation • Continued dewatering to settling ponds <p><i>ULRHEF Intake Diversion Channel</i></p> <ul style="list-style-type: none"> • Drilling, blasting and excavation of diversion channel <p><i>TX-Line</i></p> <ul style="list-style-type: none"> Segment 2 – Line crews working at structures 36 and 39 Segment 3 – Ground works from structure 41-43 Segment 4 – Line crews working at structures 57 and 70 <ul style="list-style-type: none"> • Segment 10 – Formula installing Ryan River bridge
Monday August 18	ML, DA	Sun and Cloud	<p><i>BDRHEF Tunnel Portal</i></p> <ul style="list-style-type: none"> • Drilling, blasting and stabilization of the tunnel • Seepage from tunnel pumped from sump at portal entrance into settling ponds <p><i>BDRHEF Powerhouse</i></p> <ul style="list-style-type: none"> • Continued formworks <p><i>BDRHEF Intake Access Road</i></p> <ul style="list-style-type: none"> • Road construction <p><i>ULRHEF Downstream Portal</i></p> <ul style="list-style-type: none"> • Drilling, blasting and stabilization of the tunnel • Seepage from tunnel pumped from sump at portal entrance into settling ponds <p><i>ULRHEF Powerhouse</i></p> <ul style="list-style-type: none"> • Backfilling of powerhouse foundation • Continued dewatering to settling ponds <p><i>ULRHEF Intake Diversion Channel</i></p> <ul style="list-style-type: none"> • Drilling, blasting and excavation of diversion channel <p><i>TX-Line</i></p> <ul style="list-style-type: none"> • Segment 3 – Line crews working on structures 42 and 43, and ground works from structures 41-43 • Segment 5 – Line crews working on structures 81 and 92-100 • Segment 5 & 6 – Mumleqs fallers working between structures 83 - 96 • Segment 7 – Timber management • Segment 10 – Formula installing Ryan River bridge

Date	IEM Team Personnel	Weather Conditions	Monitoring Locations & Key On-site Environmental Information
Tuesday August 19	AA, DA, MS	Sun and Cloud	<p><i>BDRHEF Tunnel Portal</i></p> <ul style="list-style-type: none"> • Drilling, blasting and stabilization of the tunnel • Seepage from tunnel pumped from sump at portal entrance into settling ponds <p><i>BDRHEF Powerhouse</i></p> <ul style="list-style-type: none"> • Continued formworks <p><i>BDRHEF Intake Access Road</i></p> <ul style="list-style-type: none"> • Continued road construction <p><i>ULRHEF Downstream Portal</i></p> <ul style="list-style-type: none"> • Drilling, blasting and stabilization of the tunnel • Seepage from tunnel pumped from sump at portal entrance into settling ponds <p><i>ULRHEF Powerhouse</i></p> <ul style="list-style-type: none"> • Foundation backfill • Continued dewatering to settling ponds <p><i>ULRHEF Intake Diversion Channel</i></p> <ul style="list-style-type: none"> • Drilling, blasting and excavating of diversion channel during day and night shift <p><i>TX-Line</i></p> <ul style="list-style-type: none"> • Segment 1 – Helicopter installation of structures 4-7 and 21-24 • Segment 4 – Helicopter installation of structures 51, 53-56, and ground works at structure 58. • Segment 5 – Mumleqs fallers working between structures 83-96 • Segment 7 – Timber management • Segment 10 – Formula installing Ryan River bridge
Wednesday August 20	AA,DA, MS,TH, MF	Mostly cloudy	<p><i>BDRHEF Tunnel Portal</i></p> <ul style="list-style-type: none"> • Drilling, blasting and stabilization of the tunnel • Seepage from tunnel pumped from sump at portal entrance into settling ponds <p><i>BDRHEF Powerhouse</i></p> <ul style="list-style-type: none"> • Continued formworks <p><i>BDRHEF Intake Access Road</i></p> <ul style="list-style-type: none"> • Continued road works • Grubbing, stripping and merchantable timber removal at crane pad <p><i>ULRHEF Downstream Portal</i></p> <ul style="list-style-type: none"> • Drilling, blasting and stabilization of the tunnel • Seepage from tunnel pumped from sump at portal entrance into settling ponds <p><i>ULRHEF Powerhouse</i></p> <ul style="list-style-type: none"> • Installation of wire mesh for slope stabilization • Continued dewatering to settling ponds <p><i>ULRHEF Intake Diversion Channel</i></p> <ul style="list-style-type: none"> • Drilling, blasting and excavating of diversion channel <p><i>TX-Line</i></p> <ul style="list-style-type: none"> • Segment 1 – Straightening poles at structures 4-7 and 21-24. • Segment 3 – Ground works at structure 40 • Segment 4 – Straightening poles at structures 51, and 53-56. • Segment 5 – Mumleqs fallers working between structures 83-96 • Segment 10 – Formula installing Ryan River bridge

Date	IEM Team Personnel	Weather Conditions	Monitoring Locations & Key On-site Environmental Information
Thursday August 21	AA,DA,MF, MS,TH, AS	Mostly cloudy	<p><i>BDRHEF Tunnel Portal</i></p> <ul style="list-style-type: none"> • Drilling, blasting and stabilization of the tunnel • Seepage from tunnel pumped from sump at portal entrance into settling ponds <p><i>BDRHEF Powerhouse</i></p> <ul style="list-style-type: none"> • Concrete works commenced starting with mud slab pour <p><i>BDRHEF Intake Access Road</i></p> <ul style="list-style-type: none"> • Continued road works • Grubbing, stripping and merchantable timber removal at the crane pad • Re-watering of culvert at spoil site 6 <p><i>ULRHEF Downstream Portal</i></p> <ul style="list-style-type: none"> • Drilling, blasting and stabilization of the tunnel • Seepage from tunnel pumped from sump at portal entrance into sediment ponds <p><i>ULRHEF Powerhouse</i></p> <ul style="list-style-type: none"> • Installation of wire mesh for slope stabilization • Backfilling and compaction of powerhouse foundation • Continued dewatering to settling ponds <p><i>ULRHEF Intake Diversion Channel</i></p> <ul style="list-style-type: none"> • Drilling, blasting and excavating of diversion channel during day and night shift <p><i>TX-Line</i></p> <ul style="list-style-type: none"> • Segment 3 – Ground works at structure 36 • Segment 4 – Straightening and dressing poles at structures 51-56 • Segment 5 – Spider hoe working at structure 97, Mumleqs fallers working between structures 83-96, and ground works at structures 100, 110 and 111. • Segment 6 – Mumleqs fallers working on RoW clearing within helipad 6a, 6b, and 7. • Segment 10 – Formula installing Ryan River bridge, Mumleqs constructing access tracks and building road
Friday August 22	AA, AS, MF, MS	Mostly cloudy with isolated showers	<p><i>BDRHEF Tunnel Portal</i></p> <ul style="list-style-type: none"> • Drilling, blasting and stabilization of the tunnel • Seepage from tunnel pumped from sump at portal entrance into sediment ponds <p><i>BDRHEF Powerhouse</i></p> <ul style="list-style-type: none"> • Concrete works continued – Mud slab <p><i>BDRHEF Intake Access Road</i></p> <ul style="list-style-type: none"> • Road construction • Grubbing, stripping and merchantable timber removal at crane pad <p><i>ULRHEF Downstream Portal</i></p> <ul style="list-style-type: none"> • Drilling, blasting and stabilization of the tunnel • Seepage from tunnel pumped from sump at portal entrance into sediment ponds <p><i>ULRHEF Powerhouse</i></p> <ul style="list-style-type: none"> • Installation of wire mesh for slope stabilization • Backfilling and compaction of powerhouse foundation • Continued dewatering to settling ponds <p><i>ULRHEF Intake Diversion Channel</i></p> <ul style="list-style-type: none"> • Drilling, blasting and excavating at the diversion channel • Shotcrete application for slope stabilization <p><i>TX-Line</i></p> <ul style="list-style-type: none"> • Segment 5 – Mumleqs fallers working between structures 83-96, ground works on structures 92-93, 100, 110-111, 114-116 • Segment 6 – Mumleqs fallers clearing RoW and constructing helipads • Segment 10 – Formula installing Ryan River bridge

Date	IEM Team Personnel	Weather Conditions	Monitoring Locations & Key On-site Environmental Information
Saturday August 23	AA, AS, DA, MF, MS, VD	Sun and cloud	<p>BDRHEF Tunnel Portal</p> <ul style="list-style-type: none"> • Drilling, blasting and stabilization of the tunnel • Seepage from tunnel pumped from sump at portal entrance into sediment ponds <p>BDRHEF Powerhouse</p> <ul style="list-style-type: none"> • Powerhouse frameworks <p>BDRHEF Intake Access Road</p> <ul style="list-style-type: none"> • Road construction • Grubbing, stripping and merchantable timber removal at crane pad <p>ULRHEF Downstream Portal</p> <ul style="list-style-type: none"> • Drilling, blasting and stabilization of the tunnel • Seepage from tunnel pumped from sump at portal entrance into sediment ponds <p>ULRHEF Powerhouse</p> <ul style="list-style-type: none"> • Installation of wire mesh for slope stabilization • Continued dewatering to settling ponds <p>ULRHEF Intake Diversion Channel</p> <ul style="list-style-type: none"> • Drilling, blasting and excavating at the diversion channel • Shotcrete application for slope stabilization <p>TX-Line</p> <ul style="list-style-type: none"> • Segment 5 – Mumleqs fallers working between structures 83-96, ground works on structures 92-93, 100, 110-111, 114-116 • Segment 6 – Mumleqs fallers clearing RoW and constructing helipads • Segment 10 – Formula installing Ryan River bridge, concrete and grouting of bridge deck, Mumleqs constructing access tracks and deactivating roads

IEM Team Personnel: AA – Anthony Andrews; AS – Anne Sutherland; DA – Danita Abraham; MF – Matt Fuller; ML – Mackenzie Lee; MS – Mandala Smulders; TH – Tom Hicks; VD – Vanessa Dan

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 20	Pre-work meeting	SES, WEL, Mumleqs, Hedberg, Innergex,	Pre-activity meeting to review the construction work plan for Segment 7. Discussion focused on access to steep terrain and safety requirements, as well as areas where IEM monitoring is required	N/A
	Pre-work meeting	SES, Innergex, CRT-ebc	Pre-activity meeting to discuss the mud slab concrete pour at the BDR HEF powerhouse. Discussions focused on dewatering and treatment of water in contact with the curing concrete. All dewatering was directed to the sediment treatment/infiltration ponds for pH treatment.	N/A
	Pre-work meeting	SES, WEL, Mumleqs, Hedberg, Innergex,	Pre-activity meeting to review the South Lillooet FSR upgrade prescriptions and access construction work plans for Segment 6. Discussion focused on the need to isolate the work area and conduct a fish salvage in areas of the flooded FSR where fish were observed and on dewatering plans to be implemented prior to adding road ballast to the flooded sections of the road ROW.	N/A
August 22	Pre-work meeting	SES, WEL, Mumleqs, Innergex	Pre-activity meeting to review the clearing prescriptions and construction work plans for Segment 8, 9a and 14. Discussion focused on access constraints and on sections requiring IEM monitoring	N/A
	Email, phone call, radio communications	SES, WEL, CRT-ebc, Innergex	The IEM was informed that a CRT-ebc sub-contractor hit a Bull (male) Moose while traveling up the Lillooet River FSR at 12km. The collision resulted in the death of the Moose, a project identified VC. CRT-ebc will prepare an environmental incident report for submission to the Owner and IEM (EIR#12), and recommended action items will be added and tracked in the ITM until they are enacted.	ULR#19

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 1 –10, & 14	Suitable Raptor Nesting Habitat	<i>IEM presence is required when clearing within suitable Northern Goshawk (NOGO), and Western Screech-Owl (WESO) nesting habitat during the breeding period. A nest survey is required by WEL QPs prior to clearing within 600m of suitable Peregrine Falcon (PEFA) nesting habitat.</i>
		Within 150m of wetlands or 100m of Coastal Tailed-Frog Streams	<i>IEM presence is required when clearing within 150m of wetlands or 100m of Coastal Tailed-Frog Streams, to ensure clearing area is minimized.</i>
		Old Growth Management Areas (OGMAs)	<i>IEM monitoring is required when clearing within legally designated OGMAs, to ensure clearing area is minimized.</i>
		Ungulate Winter Range (UWR)	<i>IEM monitoring is required when clearing within identified deer and moose UWR, to ensure clearing area is minimized.</i>
		Suitable Class 1 & 2 Grizzly Bear forage habitat	<i>IEM monitoring is required when clearing within identified Class 1 & 2 Grizzly Bear forage habitat, to ensure clearing area is minimized.</i>
ULRHEF powerhouse, and Intake diversion channel	Within 50m of identified archeologically significant area	Archaeologically significant site EdRu-3	<i>The ASMP recommends that an archaeological technician from the Lil'wat Nation be present to monitor initial ground-disturbance activities within 50 m of the EdRu-3 site boundaries.</i>
	Within 30m of the Upper Lillooet River	Riparian area and fish bearing streams	<i>IEM presence is required when working within 30m of the Upper Lillooet River. Instream acoustic pressure monitoring required when blasting within 30m of the Upper Lillooet River.</i>
Lillooet River FSR; ULRHEF intake access; FSR realignment at Truckwash Creek	Access roads above the lower limit of the 200m buffer Truckwash Creek Migration Corridor to the ULRHEF intake; including FSR realignment at Truckwash Creek	Mountain Goat UWR	<i>If a goat is observed within 500 m of construction operations, construction must cease for at least 48 hours. The IEM must record and submit all goat observations to FLNR within 48 hours.</i>

4.0 Hydroelectric Facilities

4.1 Ancillary Components – Monitoring Results

38km Laydown

- Material crushing and screening plant operation continued this week. A watering hose was used effectively for dust control at the screening plant. No environmental concerns were noted.

4.2 Boulder Creek Hydroelectric Facility – Monitoring Results

BDRHEF Downstream Portal and Powerhouse

- Tunneling activities (including: drilling, blasting, excavation, rock bolts and shotcrete/mesh installation) continued.
- The settling ponds were effectively used to manage water from seepages encountered during tunnelling activities and to manage excess process water this week. No discharge from the sediment ponds occurred this week; therefore, no WQ samples were collected.
- Concrete form works were inspected and a pre-work meeting was conducted on August 20th prior to the concrete mud slab pour at the BDRHEF powerhouse. Seepage water from the excavation and water coming in contact with concrete is being directed to a central sump and is pH adjusted prior to discharging to the sediment ponds currently being used to manage seepage/process water from the tunneling operations (Photo 2).

BDRHEF Intake Access Road & Crane Pad

- Road construction and repair work was completed according to methods outlined in the work plan and continued under IEM supervision this week (Photo 1). The IEM can confirm that all excavator operators performing the repair and stabilization works demonstrated due care when operating on and adjacent to steep slopes. To the extent possible operators prevented rocks and debris from rolling downhill during the repair works to prevent additional impacts to standing timber outside of the approved OLTC boundaries.

Environmental Summary:

- Seepage flowing out of the tunnel continues to be collected at the portal tunnel entrance in a sump and this water is then pumped from the sump to the oil/water separator, pH adjustment holding tank, and settlement ponds for treatment. The pH was monitored daily by the contractor and a CO₂ diffuser was used as necessary to ensure pH was within acceptable surface water quality guidelines (pH 6.5 – 9). No discharge from the treatment ponds occurred during this reporting period; therefore, the IEM did not collect WQ results.
- Water from the Boulder Creek water withdrawal site authorized in the Short Term Water Use Approval (No.A2006123) was used effectively for dust suppression above 37.5km of the Lillooet River FSR and on active construction site access roads.

- The gravity fed water diversion system was used in tunneling and shotcrete process works in accordance with Short Term Water Use Approval (No.A2006123). No WQ or environmental concerns were noted.

Photos:



Photo 1. Completing slope stabilization along the new Boulder Intake access road following prescription outlined in the work plan. (August 21, 2014).



Photo 2. Concrete mud slab pour. Dewatering of seepage from within the forms was pumped to the sediment ponds. Water has not yet reached the third treatment pond (August 20, 2014).

Water Quality Results

The following table presents the results of the routine water quality 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* water quality (turbidity 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)
August 21	N/A	BDR Background – BRDHEF upstream of intake *not currently accessible*	N/A	N/A	N/A	N/A
August 21	N/A	BDR #1 – Downstream of BDRHEF intake *not currently accessible*	N/A	N/A	N/A	N/A
August 21	15:35	BDR #2 – Upstream of BDRHEF Powerhouse	7.8	58.2	34	14.2
August 21	15:15	BDR #3 – Downstream of BDRHEF Powerhouse at Pebble Creek Bridge	7.9	55.7	32	14.4

4.3 Upper Lillooet River Hydroelectric Facility – Monitoring Results

ULRHEF Powerhouse and Access Road

- Placement of structural fill and slope protection measures were installed at the ULR powerhouse this week following issuance of the LTC for powerhouse concrete construction.
- Sediment ponds were used to treat seepage water from within the powerhouse excavation (Photo 4). Water from the ponds discharged to vegetation prior to reaching the Lillooet River. Further to routine weekly WQ sampling (see below), turbidity was visually monitored during periodic component visits by the IEM both upstream and downstream of the discharge point on the Lillooet River. Water entering the Lillooet River remained visually less turbid than the River itself during each inspection and works within the powerhouse excavation did not come in contact with the seepage water during this reporting period. No WQ concerns were noted during this reporting period and moving forward, WQ (other than routine), will only be conducted if the construction activities occurring within the powerhouse excavation (now completed to grade) occur that have the potential to affect WQ.

ULRHEF Intake and Access Roads

- Works associated with the intake diversion channel occurred daily as the landslide risk remained within acceptable limits during this reporting period (Photo 3). Works included drilling, blasting, excavation, and slope stabilization (shotcrete application). Night shift works at the intake began on August 20th and the IEM was onsite to monitor when excavation and construction activities took place within 30m of the Lillooet River.

ULRHEF Downstream Portal

- Tunneling activities continued throughout this monitoring period. The sediment ponds installed adjacent to Truckwash Creek were used to treat the seepage and process water emanating from the tunnel. No surface discharge from the sediment ponds was observed this week; therefore no WQ measurements were taken by the IEM. Blast rock was hauled to the lower spoil area and managed according to the ARD management plan. No environmental concerns were noted.

Environmental Summary:

- The IEM was onsite full time during dayshift and night shift for all blasts and excavation activities to document that all efforts to prevent rocks from entering the Lillooet River were made and to record approximate quantities in the event rocks do enter the River. The IEM recognizes that large rocks are not a deleterious substance and that rock entering the river at this location is unlikely to cause serious harm to fish given the marginal fish habitat present at this location due to the water velocity within the rock canyon.
- A gravity fed water extraction system was used for drilling activities according to the conditions of the Short Term Water Use Approval (No.A2006123) (Photo 4).

Photos:



Photo 3. ULRHEF intake diversion channel excavation adjacent to the Lillooet River. (August 21, 2014).



Photo 4. Conditions of the ULR HEF powerhouse sediment ponds. (August 20, 2014).

Water Quality Results

The following table presents the results of the routine water quality 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 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 the Lillooet River due to seasonal melt fluctuations and large tributary inputs. In the event that an exceedance of *in-situ* water quality (turbidity 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)
August 21	13:35	ULR Background – ULRHEF Intake	7.9	90.0	56	13.0
August 21	14:12	ULR # 1 – Upstream of ULRHEF Powerhouse	8.0	70.6	45	11.5
August 21	14:25	ULR #2 – Downstream of ULRHEF Powerhouse between 40.5k and 41k	8.0	62.4	38	10.4
August 21	14:40	ULR #3 – Upper Lillooet FSR 38km Laydown – D/S of Boulder confluence	7.9	49.7	38	14.7
August 21	18:30	ULR #4 – Upper Lillooet FSR 24km – D/S of all works and Meager confluence	8.1	145*	51	11.3

4.4 Hydroelectric Facilities – Recommendations

The installation of ESC measures (including hydro-seeding, protection with poly-sheeting) should be performed on all cut-slopes at risk of eroding during rain events. In particular, the steep cut slopes at the ULRHEF diversion channel, ULRHEF downstream tunnel portal, ULRHEF powerhouse, and BDRHEF tunnel portal, are all at risk of developing rills during heavy rain events. Where these cut slopes are permanent a permanent solution is recommended.

The IEM recommends that a shallow interception ditch or swale be installed at the top of the ULRHEF intake diversion channel cut-slope. This ditch/swale should be installed to direct the surface runoff towards the adjacent forested area for infiltration, and prevent it from flowing over the slope. The intent is to prevent further generation of rills that have already begun to develop.

4.5 Hydroelectric Facilities – Upcoming Works

CRT-ebc has confirmed that the failed crossing at 39.7km (*ULR#8*) will be repaired and/or replaced, and the failed culvert at 47km (*ULR#4*) will be remediated by removing debris from within the stream. This work will be completed during the 2014 instream work window following the preparation of a work plan and approval by MFLNRO.

Excavation of the intake diversion channel is scheduled to continue next week at the ULRHEF intake provided the landslide hazard rating is at suitable levels to permit works to continue. Tunneling at the BDRHEF and ULRHEF downstream tunnel portals will continue for the remainder of the season. Foundation preparations at the ULRHEF and BDRHEF powerhouses will continue for the next two weeks. Repair work and slope stabilization of the new sections of the BDRHEF intake access road will continue for the next 3-5 weeks.

5.0 Transmission Line

5.1 Monitoring Results

Segment 1-10 & 14

- Pole installation and foundation works continued in Segments 1 – 5 this week. Helicopters were used to set poles in Segments 1 & 4.
- Hand clearing occurred within Helicopter pads in Segment 6 and steep slope falling occurred along the FSR in Segment 5. Temporary closures of the FSR were required in Segment 5 and remained under one hour in length as approved by MFLNRO.
- Merchantable timber was decked roadside in Segments 5 and 7. Waste brush was piled in preparation for chipping or burning once fire hazard and venting indices permit.
- Access roads were upgraded/constructed in Segments 10 this week. The Ryan River precast decking was installed and grouted during this reporting period following IEM inspection of the form work (Photo 5). No environmental concerns were noted during the grouting activities or during other environmental monitoring inspections.
- On August 20th, a kick-off meeting was held to discuss the Lillooet South FSR upgrade works scheduled to commence next week. Items including best practices, working near wetlands and fish-bearing streams, fish salvage and maintenance of fish passage were discussed as per the approved Work Plan. MFLNRO granted written approval of proposed road closures as proposed by WEL.

Environmental Summary:

- The IEM was present as required when clearing activities occurred within 150m of wetlands, 30m of a stream, 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 NOGO, and WESO, suitable nesting habitat. All flagged boundaries were respected during clearing activities. No environmental issues were observed.

Photos:



Photo 5. Grouting of Ryan River bridge deck panels (August 22, 2014).



Photo 6. Flooded section of the South Lillooet River FSR containing fish. (August 20, 2014).

Water Quality Results

Date	Time	Sample Location Description	pH	Turbidity (NTU)	Temperature (°C)
No WQ measurements were recorded at active Tx-line work areas during this reporting period. Construction and clearing activities had no visual effect on WQ.					

5.2 Transmission Line – Recommendations

No recommendations are provided for this reporting period.

5.3 Transmission Line – Upcoming Works

Pole installation and dressing is scheduled to continue in Segment 4 & 5 next week. Clearing is scheduled to continue in Segment 3, 4, 5 & 7 and in Segment 9 and 10. Upcoming transmission line works will be focused on road construction, pole installation, and completing the clearing within the Segments 3-10.

6.0 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) and will be submitted to the IEM on a weekly basis. Wildlife Observation forms will be summarized on a monthly basis and appended to the first WEMR of the following month. 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

7.0 Mountain Goat Monitoring Program

The critical early summer forage period for Mountain Goats ended; therefore Mountain Goat Monitoring has been temporarily suspended until the fall monitoring period as outlined in the Mountain Goat Management Plan.

No Mountain Goats were observed within 500m line of sight of construction activities during this reporting period; therefore no work stoppages were required.

8.0 Environmental Issues Tracking Matrix (ITM)

8.1 Hydroelectric Facilities (ULRHEF & BDRHEF)

Issue Tracking		Environmental Issue		Mitigation Measures			
ID No.	Status	Location	Issue Description	Action Taken/Recommended	Date of Identification	Targeted Date for Completion	Date Completed
ULR#4	Open	47km – Lillooet River FSR	A log box structure failed while being crossed by an excavator (EIR002).	1. CRT-ebc to prepare an EIR detailing the cause, description and actions items related to the incident.	May 23, 2014	May 26, 2014.	
				2. IEM to review and approved the EIR.			
				3. CRT-ebc employees will be reminded of spill response procedures and how to use the spill kits in a potential future event.			
				4. CRT-ebc to confirm that load ratings of equipment adhere to maximum crossing structure load ratings.			
				5. Complete FSR and temporary access road crossing assessment by a Qualified Professional.		June 26, 2014	
				6. Determine the requirements for crossing structure remediation or replacement			
				7. Develop a work plan to remediate the failed log box structure and execute the approved plan during the 2014 instream works window. On July 19 th , 2014 CRT-ebc confirmed that the failed crossing structure [at 47km of the Lillooet River FSR; a fish bearing stream] will be remediated by cleaning debris and material from the stream and banks. A work plan will be submitted and mitigation measures prescribed by a QP will be implemented. This work must occur during the instream works window.		September 15, 2014	

Issue Tracking		Environmental Issue		Mitigation Measures			
ID No.	Status	Location	Issue Description	Action Taken/Recommended	Date of Identification	Targeted Date for Completion	Date Issue Closed
ULR#8	Open	39.7km – Lillooet River FSR	Stream 9 – log box structure failure (EIR004).	Develop a work plan to remediate the failed log box structure and execute during the 2014 instream works window. On July 19 th , 2014 CRT-ebc confirmed that this crossing structure will be repaired or replaced during the 2014 instream works window following MFLNRO approval.	May 28, 2014	September 15, 2014	
ULR#10	Open	Lillooet River FSR	Innergex issued stop work order for heavy hauling on Lillooet River FSR	Recommendations have been submitted to MFLNRO for review and approval. Work plan submission and repairs to be completed prior to September 15 for crossing structures at 39.7km and 47km of the Lillooet River FSR.	May 28, 2014	September 15, 2014	-
ULR#17	Open	BDR Intake Access Road	Damage to standing timber and impacts outside of minimized clearing boundary & approved OLTC limit (both within and adjacent to UWR)	1. Prepare and submit EIR#011 outlining the root cause of the incident and how it will be avoided in future.	July 25 th , 2014	July 30, 2014	August 1, 2014
				2. Assess damage to standing timber and impacts outside of the minimized clearing boundaries and approved OLTC (both within and adjacent to UWR). Preliminary information has been provided to satisfy the requirements of ULR#18, however detailed survey is necessary to confirm impacted areas and access is currently not available due to slope stability issues.	Confirmed in Hedberg report July 25 th , 2014	Pending safe work access – mid-September, 2014	-
ULR#19	Open	Lillooet River FSR	CRT-ebc subcontractor (Summit Camps) hit a moose while driving at 12km resulting in the death of the moose (a project VC)	Prepare and submit EIR#012 outlining the root cause of the incident and how it will be avoided in future.	August 22, 2014	August 24, 2014	

next ITM – ULR#20

8.2 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 Issue Closed
<i>No outstanding environmental issues (next ITM – Tx#2)</i>							