


Upper Lillooet Hydro Project

Weekly Environmental Monitoring Report #77

Reporting Period: October 25 – October 31, 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
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Harriet VanWart	Lil'wat Nation	
		Date Prepared: December 15, 2015 Date Submitted: December 28, 2015

Owner Construction Permits and Approvals

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

Contractor Construction Permits and Approvals

Waste Discharge under the Code of Practice for the Concrete and Concrete Products Industry under the Environmental Management Act (Authorization No. 107204) Tracking No. 326969 (Renewal 1)
Wildlife Act Permits – Pacific Tailed Frog Salvage Permit # SU15-164805; Fish Salvage Permit # SU15-174722
Fisheries and Oceans Canada – Anadromous Fish Salvage Permit #XR 178 2015
BC Safety Authority – Temporary Construction Electrical Service Permit EL-140698-2014
Municipal Wastewater Regulation - Authorization # 107032
Water Supply System Construction Permits – VCH-14-613 for Main Camp
Water Supply System Permit to Operate Issued July 30th, 2014 for Main Camp
Section 6(3) and Schedule 3 Wildfire Regulations Fire Exemption for Ryan River Bridge File No. 14350-07
SLRD Building Inspection Report dated August 13, 2014 - Construction Camp Building Permit No. 10830
Lillooet River FSR Temporary Road Closures Approval File No. 11250-32/6123 (Amendment 1, 2)
Lillooet South FSR Temporary Road Closures Approval File No. 11250-32/7977
SLRD Building Permits for Mechanic Shop (10862) and Carpentry Shop (10836) March 18, 2015
SLRD Building Permit Stages 1 - 4 – Boulder Powerhouse Architectural, Electrical and Mechanical (10865) October 8, 2015
SLRD Building Permit Stages 1 - 4 – Upper Lillooet Powerhouse Architectural and Mechanical (10864) October 6, 2015

ACRONYMS:

AMBNS	Active Migratory Bird Nesting Survey	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.
Golder	Golder Associates	WEMR	Weekly Environmental Monitoring Report
GWR	Mountain Goat Winter Range	WHA	Wildlife Habitat Area
Hedberg	Hedberg and Associates Ltd.	WQ	Water Quality
HWM	High water mark		
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
Sunday, October 25	SE, AS	Rain	<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 • PAG stockpile construction at KM 41.75 on the Lillooet River FSR <p>ULRHEF Intake</p> <ul style="list-style-type: none"> • Rebar and formwork installation • Concrete pour • Drilling, blasting and tunnel stabilization • Dewatering to sediment basins • Covering the outer edge of spoil pile slopes with organic material <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"> • Installation, welding and backfill from 2+800 – 4+075 <p>ULRHEF Powerhouse</p> <ul style="list-style-type: none"> • Superstructure construction • Manifold installation <p>BDRHEF Intake Access Ramp and Diversion Tunnel</p> <ul style="list-style-type: none"> • Access pad construction on left bank near diversion tunnel entrance <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"> • Superstructure construction • Distributer and turbine housing installation <p>TX-Line</p> <ul style="list-style-type: none"> • Segment 1 and 2 <ul style="list-style-type: none"> ➢ Demolition works and structure installation ➢ Conductor clipping • Segment 12 <ul style="list-style-type: none"> ➢ Groundworks for pole foundations
Monday, October 26	BA, AS, TH	Cloudy	<p>Construction Camp, Laydown Areas and the Lillooet River FSR</p> <ul style="list-style-type: none"> • Road maintenance on the Lillooet River FSR • PAG stockpile construction at KM 41.75 on the Lillooet River FSR • Road repairs from KM 41 – 41.2 on the Lillooet River FSR <p>ULRHEF Intake</p> <ul style="list-style-type: none"> • Rebar and formwork installation • Drilling, blasting and tunnel stabilization • Dewatering to sediment basins • Covering the outer edge of spoil pile slopes with organic material <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"> • Installation, welding and backfill from 2+800 – 4+075 • Excavation for Drain #5 <p>ULRHEF Powerhouse</p> <ul style="list-style-type: none"> • Superstructure construction • Manifold installation

Date	IEM Team Personnel	Weather Conditions	Key Monitoring Locations & Activities
			<p><i>BDRHEF Intake Access Ramp and Diversion Tunnel</i></p> <ul style="list-style-type: none"> • Rock consolidation above diversion tunnel <p><i>BDRHEF Downstream Tunnel Portal</i></p> <ul style="list-style-type: none"> • Drilling, blasting and tunnel stabilization <p><i>BDRHEF Powerhouse</i></p> <ul style="list-style-type: none"> • Superstructure construction • Distributer and turbine housing installation <p><i>TX-Line</i></p> <ul style="list-style-type: none"> • Segment 1 & 2 <ul style="list-style-type: none"> ➢ Structure installation • Segment 9 <ul style="list-style-type: none"> ➢ Road deactivation on Salmon Main • Segment 12 <ul style="list-style-type: none"> ➢ Groundworks for pole foundations • Segment 12 and 13 <ul style="list-style-type: none"> ➢ Road works • Segment 14 and 16 <ul style="list-style-type: none"> ➢ Hand falling for structures 333-336 and 393-396
Tuesday, October 27	BA, AS	Clear	<p><i>Construction Camp, Laydown Areas and the Lillooet River FSR</i></p> <ul style="list-style-type: none"> • Road maintenance on the Lillooet River FSR • PAG stockpile construction at KM 41.75 on the Lillooet River FSR <p><i>ULRHEF Intake</i></p> <ul style="list-style-type: none"> • Rebar and formwork installation • Concrete pour • Drilling, blasting and tunnel stabilization • Dewatering to sediment basins • Covering the outer edge of spoil pile slopes with organic material <p><i>ULRHEF Downstream Tunnel Portal</i></p> <ul style="list-style-type: none"> • Drilling, blasting and tunnel stabilization <p><i>ULRHEF Penstock</i></p> <ul style="list-style-type: none"> • Installation, welding and backfill from 2+800 – 4+075 • Excavation for Drain #5 <p><i>ULRHEF Powerhouse</i></p> <ul style="list-style-type: none"> • Superstructure construction • Manifold installation <p><i>BDRHEF Intake Access Ramp and Diversion Tunnel</i></p> <ul style="list-style-type: none"> • Rock consolidation above diversion tunnel <p><i>BDRHEF Downstream Tunnel Portal</i></p> <ul style="list-style-type: none"> • Drilling, blasting and tunnel stabilization <p><i>BDRHEF Powerhouse</i></p> <ul style="list-style-type: none"> • Superstructure construction • Distributer and turbine housing installation <p><i>TX-Line</i></p> <ul style="list-style-type: none"> • Segment 1 & 2 <ul style="list-style-type: none"> ➢ Structure installation • Segment 9 <ul style="list-style-type: none"> ➢ Road deactivation on Salmon Main • Segment 12 <ul style="list-style-type: none"> ➢ Groundworks for pole foundations • Segment 12 and 13 <ul style="list-style-type: none"> ➢ Road works

Date	IEM Team Personnel	Weather Conditions	Key Monitoring Locations & Activities
			<ul style="list-style-type: none"> • Segment 16 <ul style="list-style-type: none"> ➢ Hand falling for structures 393-396
Wednesday, October 28	BA, AS	Clear	<p>Construction Camp, Laydown Areas and the Lillooet River FSR</p> <ul style="list-style-type: none"> • Road maintenance on the Lillooet River FSR • PAG stockpile construction at KM 41.75 on the Lillooet River FSR <p>ULRHEF Intake</p> <ul style="list-style-type: none"> • Rebar and formwork installation • Drilling, blasting and tunnel stabilization • Dewatering to sediment basins • Covering the outer edge of spoil pile slopes with organic material <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"> • Installation, welding and backfill from 2+800 – 4+075 <p>ULRHEF Powerhouse</p> <ul style="list-style-type: none"> • Superstructure construction • Manifold installation <p>BDRHEF Intake Access Ramp and Diversion Tunnel</p> <ul style="list-style-type: none"> • Rock consolidation 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"> • Superstructure construction <p>TX-Line</p> <ul style="list-style-type: none"> • Segment 1 & 2 <ul style="list-style-type: none"> ➢ Structure installation • Segment 12 <ul style="list-style-type: none"> ➢ Groundworks for pole foundations • Segment 12 and 13 <ul style="list-style-type: none"> ➢ Road works • Segment 14 <ul style="list-style-type: none"> ➢ Hand falling for structures 333-336
Thursday, October 29	BA, AS	Overcast	<p>Construction Camp, Laydown Areas and the Lillooet River FSR</p> <ul style="list-style-type: none"> • Road maintenance on the Lillooet River FSR • PAG stockpile construction at KM 41.75 on the Lillooet River FSR <p>ULRHEF Intake</p> <ul style="list-style-type: none"> • Rebar and formwork installation • Drilling, blasting and tunnel stabilization • 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"> • Installation, welding and backfill from 2+800 – 4+075 • Lining from 3+400 – 3+800 <p>ULRHEF Powerhouse</p> <ul style="list-style-type: none"> • Superstructure construction • Manifold installation <p>BDRHEF Intake Access Ramp and Diversion Tunnel</p> <ul style="list-style-type: none"> • Rock consolidation and scaling on right bank at intake • Drilling, blasting and mucking for diversion tunnel <p>BDRHEF Downstream Tunnel Portal</p>

Date	IEM Team Personnel	Weather Conditions	Key Monitoring Locations & Activities
			<ul style="list-style-type: none"> • Drilling, blasting and tunnel stabilization <i>BDRHEF Powerhouse</i> <ul style="list-style-type: none"> • Superstructure construction <i>TX-Line</i> <ul style="list-style-type: none"> • Segment 1 & 2 <ul style="list-style-type: none"> ➢ Structure installation • Segment 12 <ul style="list-style-type: none"> ➢ Groundworks for pole foundations • Segment 12 and 13 <ul style="list-style-type: none"> ➢ Road works
Friday, October 30	BA, AS	Cloudy	<p><i>Construction Camp, Laydown Areas and the Lillooet River FSR</i></p> <ul style="list-style-type: none"> • Road maintenance on the Lillooet River FSR • PAG stockpile construction at KM 41.75 on the Lillooet River FSR <p><i>ULRHEF Intake</i></p> <ul style="list-style-type: none"> • Rebar and formwork installation • Drilling, blasting and tunnel stabilization • Dewatering to sediment basins <p><i>ULRHEF Downstream Tunnel Portal</i></p> <ul style="list-style-type: none"> • Drilling, blasting and tunnel stabilization <p><i>ULRHEF Penstock</i></p> <ul style="list-style-type: none"> • Installation, welding and backfill from 2+800 – 4+075 • Lining from 3+400 – 3+800 <p><i>ULRHEF Powerhouse</i></p> <ul style="list-style-type: none"> • Superstructure construction • Manifold installation <p><i>BDRHEF Intake Access Ramp and Diversion Tunnel</i></p> <ul style="list-style-type: none"> • Rock consolidation and scaling on right bank at intake • Rock consolidation above diversion tunnel <p><i>BDRHEF Downstream Tunnel Portal</i></p> <ul style="list-style-type: none"> • Drilling, blasting and tunnel stabilization <p><i>BDRHEF Powerhouse</i></p> <ul style="list-style-type: none"> • Superstructure construction • Debris flood protection berm modifications <p><i>TX-Line</i></p> <ul style="list-style-type: none"> • Segment 1 & 2 <ul style="list-style-type: none"> ➢ Structure installation • Segment 12 <ul style="list-style-type: none"> ➢ Groundworks for pole foundations • Segment 12 and 13 <ul style="list-style-type: none"> ➢ Road works
Saturday, October 31	BA, AS	Periods of rain	<p><i>Construction Camp, Laydown Areas and the Lillooet River FSR</i></p> <ul style="list-style-type: none"> • Road maintenance on the Lillooet River FSR • PAG stockpile construction at KM 41.75 on the Lillooet River FSR • Removal of pumice truck from KM 45.25 with tow-trucks and excavator and road repair (non-project related activity) <p><i>ULRHEF Intake</i></p> <ul style="list-style-type: none"> • Rebar and formwork installation • Drilling, blasting and tunnel stabilization • Dewatering to sediment basins <p><i>ULRHEF Downstream Tunnel Portal</i></p> <ul style="list-style-type: none"> • Drilling, blasting and tunnel stabilization

Date	IEM Team Personnel	Weather Conditions	Key Monitoring Locations & Activities
			<p>ULRHEF Penstock</p> <ul style="list-style-type: none"> • Installation, welding and backfill from 2+800 – 4+075 • Lining from 3+400 – 3+800 <p>ULRHEF Powerhouse</p> <ul style="list-style-type: none"> • Superstructure construction • Manifold installation <p>BDRHEF Intake Access Ramp and Diversion Tunnel</p> <ul style="list-style-type: none"> • Rock consolidation 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"> • Superstructure construction • Debris flood protection berm modifications <p>TX-Line</p> <ul style="list-style-type: none"> • Segment 1 & 2 <ul style="list-style-type: none"> ➢ Structure installation • Segment 12 <ul style="list-style-type: none"> ➢ Groundworks for pole foundations

IEM Team Personnel: TH – Tom Hicks; SS – Stephen Sims; BA – Blake Aleksich; DA – Danita Abraham; SE – Stephanie Ellis; AS – Anne Sutherland

2.0 Administrative Summary

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

Date	Communication Type	Participants	Issues Discussed	ITM ID No.
October 26	<i>Email</i>	SES, CE, INX	SES distributed Field Advice Memo #5 outlining key erosion and sediment control issues on the project site. Items in FAM #5 are included in the current version of the Issues Tracking Matrix.	BDR#25 – 28 ULR#29 – 37
	<i>Pre-work meeting</i>	CE, SES	A pre-work meeting was held prior to starting bank stabilization, ditching, and culvert installation works at KM 41 – 41.2 on the Lillooet River FSR. The IEM and CE discussed work methods for repairs within 15m of the Lillooet River.	ULR#28
	<i>Email</i>	SES, CE, INX	CE informed SES and INX that an 80 tonne wheeled crane would need to be used at the BDRHEF intake site to install mesh above the diversion tunnel. CE informed SES that spill containment measures would be installed under the crane when it is positioned within 15m of Boulder Creek.	-
	<i>Site tour</i>	SES, INX, Lil'wat Nation	SES, INX and representatives from the Lil'wat Nation toured the project site and discussed construction progress and work schedule for the remainder of 2015.	-
October 27	<i>Site tour</i>	SES, CE, INX	SES, CE and INX conducted an Erosion and Sediment Control and Winterization site inspection. ESC concerns identified in FAM#5 were reviewed onsite.	BDR#25 – 28 ULR#29 – 37

Date	Communication Type	Participants	Issues Discussed	ITM ID No.
	<i>Email</i>	SES, CE, INX	SES distributed an email follow-up to field discussions held during the Erosion and Sediment Control and Winterization site inspection. SES acknowledged the completion of ITM items and confirmed that new items discussed in the field had been added to the matrix. Garbage clean-up and general site cleanliness was highlighted in the email.	BDR#25 – 28 ULR#29 – 37
October 28	<i>Site tour</i>	CE, SES, INX, MFLNRO, JEM	The monthly IE site inspection was performed and attended by MFLNRO.	-
	<i>Email</i>	SES, CE, INX	SES provided a summary of the turbid water discharge event at the ULRHEF intake (see Section 4.2). SES acknowledged that following the event CE's environmental team held a meeting with intake crewmembers to review pumping procedures. SES requested that the IEM be made aware of all future blasts as soon as possible to allow for water quality monitoring.	-
October 29	<i>Pre-work meeting</i>	SES, CE	A pre-work meeting was held for the penstock lining works at 3+500 on the penstock alignment. All sand-blasted waste material related to the penstock lining activities needs to be bagged, stored at the KM 38 laydown and hauled offsite to an appropriate waste facility.	-
October 30	<i>Email</i>	INX, SES, CE	INX sent out a reminder of the reinstatement of project-area flight restrictions beginning on November 1.	-
	<i>Email</i>	SES, CE, INX	SES informed CE of two noise events (>75 dBA) recorded at the lower Truckwash noise meter. SES requested that CE confirm the events were related to blasting and that a noise suppression curtain will be installed at the downstream portal prior to November 1.	-
	<i>Email</i>	SES, CE, INX	CE informed SES that a safety blast needed to be performed above the BDRHEF intake diversion tunnel and safe installation of a blast mats was not possible. CE committed to reducing noise by reducing the load per delay and increasing the amount of delays.	-
October 31	<i>Email</i>	SES, CE, INX	SES distributed an updated version of the ITM.	BDR#25 – 28 ULR#29 – 37

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	Segment 6	Within 500 m of South Creek & Rohb Creek	Construction of the transmission line within 500 m of South Creek & Rohb Creek, must be conducted outside the salmon migration period (October 15 – December 31).

Component	Location	Wildlife/Archeology Concern	Construction/Timing Restrictions & Mitigations
	Segments 6 – 14	Within 150m of wetlands or 100m of Coastal Tailed Frog Streams	IEM presence is required when clearing within 150m of wetlands or 100m of CTF Streams, to ensure clearing areas are minimized.
		Riparian Vegetation Management Areas (RVMA)	IEM monitoring is required during clearing within RVMAs.
		Surface Water Quality	IEM monitoring is required during culvert installation activities in non-fish bearing waters to document adherence to the Surface Water Quality Protection Plan objectives.
		Suitable Class 1 & 2 Grizzly Bear forage habitat	IEM monitoring is required when clearing within identified Class 1 & 2 Grizzly Bear forage habitat, to ensure clearing areas are minimized.
		Ryan River Drainage	Construction of the TX Line into and across the Ryan River drainage will occur during the less critical Grizzly Bear summer foraging period (June 1 – September 1).
Lillooet River FSR & ULRHEF	Access roads above the lower limit of the 200m buffer Truckwash Creek Migration Corridor to the ULRHEF intake	Mountain Goat UWR & Migration Corridor	If a goat observation occurs within 500 m line-of-sight of construction activities, construction must cease for at least 48 hours. The IEM must record and submit all goat observations to FLNR within 48 hours.

4.0 Upper Lillooet River HEF – Monitoring Results

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

Activities:

- Routine maintenance of construction equipment within the mechanic shop and fuel management continued at the KM 38 laydown. All hazardous substance materials (waste oil, contaminated soil, used oil/hydraulic fluid containers, etc.) were stored temporarily for off-site disposal in a designated area at the laydown. The materials were all well contained and protected from the weather.
- The electric fences surrounding the construction camp were maintained and operational throughout this reporting period.
- Road maintenance and culvert installation from KM 41 – 41.2 on the Lillooet River FSR (Photo 2 and Photo 3).
- Construction of PAG stockpile area continued at KM 41.75 on the Lillooet River FSR (Photo 4).
- Ditch maintenance at KM 42.5 on the Lillooet River FSR (Photo 5).
- Silt fence installation at KM 48 of the Lillooet River FSR (ITM ULR#32).

Environmental Summary:

- On October 26, a kick-off meeting was held for the bank stabilization, ditching, and culvert installation works at KM 41 – 41.2 on the Lillooet River FSR (Photo 1). The IEM and CE discussed work methods for repairs within 15m of the Lillooet River. On October 26 and 27, repairs were completed above the high water mark of the Lillooet River and silt fencing was reinstalled on road edge following completion (Photo 2 and Photo 3). The works improved drainage, stabilized the road edge and completed recommended mitigation measures to close ITM item *ULR #28* (see Section 9.0).
- An armoured ditch was installed at KM 42.5 on the Lillooet River FSR during this reporting period (Photo 5). The ditch has eliminated runoff on the road during rain events and completed recommended mitigation measures to close ITM item *ULR #29* (see Section 9.0).
- On October 31, an excavator and tow trucks were used to remove the pumice truck from the slope at KM 45.25 on the Lillooet River FSR (Photo 6).

Photos:



Photo 1 – Kick-off meeting held at KM 41.1 prior to road repairs (October 26, 2015).



Photo 2 – Culvert installed at KM 41.1 on the Lillooet River FSR (October 27, 2015).

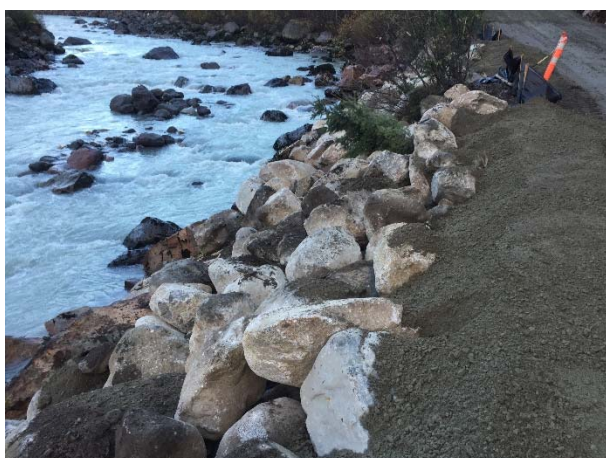


Photo 3 – Road edge repaired and armoured at KM 41.1 on the Lillooet River FSR (October 27, 2015).



Photo 4 – Construction of PAG stockpile area at KM 41.75 on the Lillooet River FSR (October 25, 2015).



Photo 5 – Armoured ditch installed at KM 42.5 on the Lillooet River FSR (October 30, 2015).



Photo 6 – Pumice truck removed from KM 45.25 on the Lillooet River FSR and towed off site (October 31, 2015).

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

Construction Activities:

- Drilling, blasting and tunnel stabilization at the ULRHEF upstream portal.
- Rebar and formwork installation.
- Concrete pours for intake structure (Photo 7 and Photo 8).
- Dewatering to ULRHEF intake sediment basins (Photo 9 and Photo 10).
- Maintenance of the ditches above the cut-slope on river right of the ULRHEF intake and along access roads (ITM ULR #33)

Environmental Summary:

- All turbid or alkaline water resulting from activities at the ULRHEF intake or upstream tunnel portal is pumped to the ULRHEF intake sediment basins. A dedicated CE crewmember is present to monitor the pumps within the intake work area and tunnel portal during active construction works. This person has the responsibility of directing all turbid or alkaline water to the sediment ponds and must verify with CE environmental staff or the IEM prior to directing any water to the Lillooet River.
- The IEM conducted regular water quality sampling at the ULRHEF intake sediment basin discharge location during this reporting period. Please see Section 4.6 Water Quality Results.
- On October 28, CE's environmental management team installed a flocculant injection system at the ULRHEF intake sediment basins (Photo 11; ITM ULR#34). The system was installed in the last cell before the lower basins to ensure sediment basin discharge remained within project water quality guidelines. On October 29, the IEM conducted water quality sampling upstream and downstream of the injection system. The system was observed to reduce turbidity from 72.0 NTU (11:07; fourth cell in upper basins) to 25.3 NTU (11:03; lower

basins). The flocculant system installation completed recommended mitigation measures to close ITM item ULR #34 (see Section 9.0).

- On October 28, the IEM was onsite to monitor water quality during a blast in the ULRHEF upstream tunnel. Following the blast, the IEM observed that the tunnel sump pumps had not been diverted to the sediment basins and that turbid water was being discharged to the Lillooet River (Photo 12). The IEM notified CE crews and the tunnel seepage water was immediately diverted to the sediment basins. The turbid discharge persisted for less than 4 minutes and no visual change to downstream water quality was observed by the IEM downstream of the input. Please see Section 4.6 for results and sampling locations. The CE crew member in charge of the sump and sediment basin pumps routinely diverted the tunnel water to the basins 15 – 20 minutes following a blast. The increased volume of seepage in the tunnel following the October 28 blast caused turbid water to reach the sump at the portal entrance in less time than during previous blasts. CE's environmental team will ensure that all tunnel-dewatering pumps are diverted to the sediment basins and the IEM is informed prior to all blasting at the ULRHEF intake.

Photos:



Photo 7 – Concrete pour at the ULRHEF intake (October 25, 2015).



Photo 8 – Concrete pour at the ULRHEF intake (October 27, 2015).



Photo 9 – First cell of ULRHEF intake sediment basins (October 26, 2015).



Photo 10 – ULRHEF intake sediment basin outlet pipe at Lillooet River (October 26, 2015).



Photo 11 – Flocculant injection system installed at ULRHEF intake sediment basins (October 28, 2015).



Photo 12 – Turbid water discharged to the Lillooet River following blast (October 28, 2015).

4.3 *Downstream Tunnel Portal*

Construction Activities:

- Drilling, blasting, mucking and stabilization works within the tunnel (Photo 13).
- Dewatering to downstream tunnel portal settling ponds.

Environmental Summary:

- On October 31, the IEM observed turbid runoff on the downstream portal access road and at portal laydown area during a significant rain event (Photo 14 and Photo 15). The IEM identified the source of the runoff at KM 45 on the Lillooet River FSR. An infilled ditch-line caused water to run over the road surface to KM 44.75 and drain down the slope to the downstream portal access road. The IEM also identified the need for a drainage path at the bottom of the access road to prevent water from fanning out into the laydown area. The IEM notified CE's environmental management team of the observed drainage deficiencies.

Photos:



Photo 13 – Current conditions at the ULRHEF downstream tunnel portal (October 25, 2015).



Photo 14 – Turbid runoff in ditch on ULRHEF downstream portal access road (October 31, 2015).



Photo 15 – Turbid runoff fanning out in laydown area at bottom of downstream portal access road (October 31, 2015).

4.4 ***Penstock***

Construction Activities:

- Penstock excavation, installation and backfill continued from 2+800 to 3+900 (Photo 16 and Photo 17).
- Penstock welding continued from 2+900 to 3+700.
- Drain #5 excavation near 3+750 (Photo 18).

Environmental Summary:

- On October 29, a kick-off meeting was held for the penstock lining works at 3+500 on the penstock alignment (Photo 19). It was agreed that all sand-blasted waste material related to the lining activities would be bagged, stored at the KM 38 laydown and hauled offsite to an appropriate waste facility.

Photos:



Photo 16 – Penstock backfill works near 2+850 (October 26, 2015).



Photo 17 – Penstock backfill near 3+200 (October 28, 2015).



Photo 18 – Excavation for Drain #5 (October 28, 2015).



Photo 19 – Penstock lining equipment at 3+500 on the penstock alignment (October 29, 2015).

4.5 **Powerhouse & Access Road**

Construction Activities:

- Superstructure construction (Photo 20 and Photo 21).
- Dewatering to Lillooet River (Photo 22).

Environmental Summary:

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



Photo 20 – Current conditions at the ULRHEF powerhouse (October 26, 2015).



Photo 21 – ULRHEF powerhouse superstructure construction (October 26, 2015).



Photo 22 – Dewatering seepage water from the ULRHEF powerhouse sump to the Lillooet River (October 31, 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 with an asterisk (*).

Date	Time	Sample Location Description	pH	Turbidity (NTU)	Cond (µS)	Temp (°C)
Routine Water Quality						
October 31, 2015	16:21	ULR Background – ULRHEF Intake	7.4	24.9	97	-
	16:35	ULR #0.5 – Downstream of ULRHEF intake at Keyhole Bridge	7.4	22.4	103	-
	10:38	ULR # 1 – Upstream of ULRHEF Powerhouse	7.5	28.6	121	-
	11:45	ULR #2 – Downstream of ULRHEF Powerhouse between KM 40.5 and KM 41	7.5	22.5	107	-
	11:56	ULR #3 – Lillooet River FSR KM 38 Laydown – D/S of Boulder confluence	7.6	25.2	112	-
	8:33	ULR #4 – Lillooet River FSR KM 24 – D/S of all works and Meager confluence	7.4	48.5*	135	-
ULRHEF Intake Sediment Basins						
October 27, 2015	11:45	Background in Lillooet River	7.3	26.2	-	-
	11:38	Sediment basin discharge to Lillooet River	7.4	28.3	-	-
	12:07	Sediment basin discharge to Lillooet River	7.4	27.0	-	-
	14:57	Sediment basin discharge to Lillooet River	7.4	13.1	-	-
October 28, 2015	11:40	Background in Lillooet River	7.3	22.7	-	-
	11:50	Sediment basin discharge to Lillooet River	7.4	13.6	-	-
	15:02	Sediment basin discharge to Lillooet River	7.3	20.9	-	-
October 29, 2015	14:31	Background in Lillooet River	7.4	28.0	-	-
	11:03	Sediment basin discharge to Lillooet River	7.5	25.3	-	-
	14:54	Sediment basin discharge to Lillooet River	7.3	33.5	-	-
October 30, 2015	11:40	Background in Lillooet River	7.4	30.7	-	-
	11:45	Sediment basin discharge to Lillooet River	7.5	13.3	-	-
October 31, 2015	16:21	Background in Lillooet River	7.4	24.9	-	-
	16:15	Sediment basin discharge to Lillooet River	7.4	17.1	-	-
ULRHEF Upstream Tunnel Portal Discharge Following Blast						
October 28, 2015	11:40	Background in Lillooet River	7.3	22.7	-	-

Date	Time	Sample Location Description	pH	Turbidity (NTU)	Cond (µS)	Temp (°C)
	11:42	Tunnel seepage water discharge to Lillooet River	7.4	1197 AU	-	-
	11:44	Seepage water diverted to sediment basins				
	11:50	Sediment basin discharge to Lillooet River	7.4	13.6	-	-

4.7 Recommendations

IEM recommendations for the ULRHEF are as follows:

- All seepage water in the intake excavation and portal should be conveyed to the sediment basins unless approved for discharge directly to the Lillooet River by the IEM or CE environmental manager.
- The IEM recommends that the access roads and tributaries on the penstock alignment be monitored regularly to ensure that no ESC issues develop with the continued installation works and traffic.
- The ULRHEF powerhouse sump water should be monitored regularly. Alkaline or turbid water should be pumped to the settling ponds for treatment.
- Environmental issues and recommendations associated with FAM#05 should be addressed in a timely manner. Refer to the ITM for outstanding items as of the end of this reporting period.

4.8 Upcoming Works

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

- Tunneling activities will continue at the ULRHEF intake portal.
- Rebar, formwork installation and concrete pours will continue at the ULRHEF intake.
- Dewatering to the ULRHEF intake sediment basins will continue.
- Tunneling activities will continue at the ULRHEF downstream tunnel portal.
- Penstock installation will continue.
- ASTRO3 over-drain construction will commence.
- Superstructure construction will continue at the ULRHEF powerhouse.

5.0 Boulder Creek Hydroelectric Facility – Monitoring Results

5.1 Intake Access Ramp & Diversion Tunnel

Construction Activities:

- Rock consolidation works on the right bank and above the diversion tunnel (Photo 23 and Photo 24).
- Drilling, blasting and excavation for the BDRHEF intake diversion tunnel (Photo 25 and Photo 26).

Environmental Summary:

- All wastewater related to diversion tunneling activities is pumped to an active water treatment system installed at the bottom of the intake access ramp (Photo 27 and Photo 28). The IEM and CE's environmental management team will routinely sample the system discharge to Boulder Creek. No water discharged from the active treatment system during this reporting period.



Photo 23 – Rock consolidation above intake access road (October 26, 2015).



Photo 24 – Rock consolidation above diversion tunnel (October 26, 2015).



Photo 25 – Drilling for diversion tunnel blast (October 29, 2015).



Photo 26 – Mucking after diversion tunnel blast (October 29, 2015).



Photo 27 – Active water treatment system at BDRHEF intake (October 29, 2015).



Photo 28 – Tunneling wastewater pumped to active water treatment system (October 29, 2015).

5.2 *Downstream Tunnel Portal and Powerhouse*

Construction Activities:

- BDRHEF powerhouse superstructure construction (Photo 29).
- Drilling, blasting, mucking and stabilization works within the tunnel (Photo 29).
- Dewatering of the tunnel and powerhouse to the oil water separator and settling ponds continued (Photo 30).
- Modifications to the BDRHEF powerhouse debris flood protection berm (Photo 31).

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 30). The water in the settling ponds continues to infiltrate to ground.

Photos:



Photo 29 – BDRHEF tunnel portal and powerhouse structure (October 27, 2015).



Photo 30 – BDRHEF tunnel portal settling ponds (October 27, 2015).



Photo 31 – Modification works on BDRHEF powerhouse debris flood protection berm (October 30, 2015).

5.3 *Water Quality Results*

The following table presents the results of the routine WQ sampling program for the BDRHEF. The IEM is undertaking a weekly monitoring program according to the conditions outlined in the Surface Water Quality Protection Plan. The regular monitoring sites have been selected to quantify WQ conditions within the Lillooet River upstream and downstream of active construction areas. The IEM acknowledges the natural variability of instream WQ conditions in Boulder Creek due to seasonal fluctuations in snowmelt. In the event that an exceedance of *in-situ* WQ (turbidity and/or pH) is deemed to be caused by project-related activities, the IEM will highlight the exceedance, discuss the cause, and outline measures undertaken by the Contractor to correct the issue. When an exceedance cannot be attributed to project related activities, the exceedance will be marked by an asterisk (*).

Date	Time	Sample Location Description	pH	Turbidity (NTU)	Cond (uS)	Temp (°C)
Routine Water Quality						
October 31, 2015	12:35	BDR BG – Upstream of BDRHEF intake	7.3	3.7	84	-
	12:41	BDR #1 – Downstream of BDRHEF intake	7.3	4.2	82	-
	15:12	BDR #2 – Upstream of BDRHEF Powerhouse	7.3	6.0	87	-
	15:18	BDR #3 – Downstream of BDRHEF Powerhouse at Pebble Creek Bridge	7.2	6.3	88	-

5.4 Recommendations

ITEM 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.
- Environmental issues and recommendations associated with FAM#05 should be addressed in a timely manner. Refer to the ITM for outstanding items as of the end of this reporting period.

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):

- Drilling, blasting and mucking will continue for the BDRHEF intake diversion tunnel.
- Rock consolidation will continue at the BDRHEF intake.
- BDRHEF downstream portal tunnelling works will continue.
- Superstructure construction will continue at the BDRHEF powerhouse.

6.0 Transmission Line – Monitoring Results

6.1 Transmission Line Construction Activities

Right-of-Way Clearing:

- Hand falling for structures 333 – 336 in Segment 14 and structures 393 – 396 in Segment 16.

Existing Road Upgrades and Access Road Construction

- Seasonal road deactivation on Salmon Main in Segment 9.
- Road construction on Road 305 in Segment 12.
- Road construction on Road 306 in Segment 13.

Transmission Line Pole Installation, Line Stringing and Clipping

- Structure installation in Segment 1 and 2 (post-wildfire rebuild works) (Photo 32).
- Groundworks for pole foundations in Segment 12.

Environmental Summary:

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

Photos:



Photo 32 – Post-wildfire rebuild works in Segment 1 (October 25, 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

- Groundworks for pole foundations in Segment 12.
- Hand falling hazard trees in Segment 12.
- Road construction in Segment 12 and 13.

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

The Owner, Contractors, and IEM team reported the following wildlife sightings in October 2015.

Upper Lillooet Hydro Project - Wildlife Observation Form					
Date	Time	Observer (Company)	Species or Description	Location	Comments
2015-10-01	16:30	Anne Sutherland (Sartori)	Peregrine Falcon	Lillooet River FSR KM 42	-
2015-10-02	16:15	Stephanie Ellis (Sartori)	Moose	Lillooet River FSR KM 28	travelling
2015-10-03	14:10	Cindi McPherson	Marten	BDRHEF PH - near office	-
2015-10-03	16:10	F. Seminario	Black Bear	Lillooet River FSR KM 47	travelling
2015-10-05	15:20	Y. Tardif	Moose	Lillooet River FSR KM 12.5	travelling
2015-10-09	12:26	Danita Abraham	Golden Eagle	Lillooet River FSR KM 38.5	travelling
2015-10-11	10:10	Blake Aleksich (Sartori)	Moose	Lillooet River FSR KM 12	travelling
2015-10-26	20:10	Blake Aleksich (Sartori)	Coyote	Lillooet River FSR KM 37.5	travelling
2015-10-27	10:55	Anne Sutherland (Sartori)	Moose and calf	Near Salal Creek	travelling

8.0 Mountain Goat Monitoring Program

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

- Noise level monitoring commenced one month earlier to collect data to be used to adaptively manage construction noise and ensure that the 75db noise level threshold is not exceeded as outlined in the Mountain Goat Management Plan.
- As of October 2, the IEM or designate was on site to monitor Mountain Goat activity within 500m of construction activities at the ULRHEF intake and the ULRHEF downstream tunnel portal. The mountain goat monitoring program was initiated a month early to collect

information on mountain goat movement and activities post Boulder Creek wildfire. Mountain goats were monitored from four sites:

- Truckwash Creek viewing river right of the Migration Corridor– MG-OBS01 (10U 467955 5612773):
- Keyhole Falls viewing the south side u-2-002 UL11 – MG-OBS02 (10U 466593 5613988); and,
- Garibaldi Pumice mine site viewing u-2-002 UL 19 – MG-OBS03 (10U 467388 561408); and,
- Salal Creek monitoring site viewing u-2-002 UL 8 – MG-OBS04 (10U 466133 5613991).

Monitoring effort was split between all sites during daylight hours, unless safety concerns or weather conditions interfered. The order of site visits rotated daily. Construction activities must cease if a goat(s) are observed moving towards the ULRHEF intake and/or if a goat(s) are observed within a 500m line of site of a construction activity. No goats were observed within 500m line of sight of construction activities and no work stoppages were required.

9.0 Environmental Issues Tracking Matrix (ITM)

9.1 Hydroelectric Facilities (ULRHEF & BDRHEF)

ITM Tracking Legend:		Work Item Open					
		Work Item Complete					
		Issue Closed					
Issue Tracking		Environmental Issue		Mitigation Measures			
ID No.	Status	Location	Issue Description	Action Taken/Recommended	Date of Identification	Targeted Date for Completion	Date Completed
BDR#25	OPEN	Boulder Powerhouse water treatment ponds	Water from the fourth cell of the water treatment ponds is seeping out of the edge of the pond, flows over an active haul path, and along the edge of the powerhouse access road before infiltrating to ground	1. Remove sediment accumulations from cells 1 – 3 of the treatment ponds to promote infiltration as outlined in the work plan. OR 2. Ensure all flowing surface water seeping from the fourth pond is conveyed in armoured ditch lines and through road culverts.	Oct. 26, 2015	Nov. 7, 2015	
BDR#26	OPEN	Boulder Intake Access Road 4 – 5KM	Ditch installation and maintenance is required to ensure runoff is directed away from the running surface and is conveyed offsite clean, without being impacted by vehicle traffic	1. Install and armour ditch line from 4 -5 KM 2. Repair all damaged or infilled culvert inlets from 4-5KM	Oct. 26, 2015	Nov. 7, 2015	
BDR#27	OPEN	Boulder Intake Access Ramp	Ditches outlined in the work plan have not been installed and the haul path is conveying sediment and sediment laden water along the length of the ramp	Install ditches on either side of the access ramp and crown/cap road to ensure runoff is conveyed in the ditch lines and not along the running surface	Oct. 26, 2015	Nov. 7, 2015	
ULR#28	CLOSED	Lillooet River FSR – KM41	The road edge eroded significantly during scaling activities and during the last major rain event and requires bank stabilization (above the HWM), ditch installation/maintenance, and silt fence repair.	1. Stabilize the road edge (above HWM) and rebuild the road in the eroded sections 2. Clean out and install ditch line along inside edge of the road and convey water across the running surface in drainage structures as needed 3. Repair silt fence along outer road edge	Oct. 26, 2015	Nov. 7, 2015	Oct. 29, 2015
ULR#29	CLOSED	Lillooet River FSR ~ KM42 – KM42.5	Water in the ditch line is eroding the road edge, and the access road culvert at the entrance to the PAG site has been damaged	1. Formalize and armour the ditch line to protect the road edge from further erosion 2. Repair the inlet to the access road culvert at the entrance to the PAG site.	Oct. 26, 2015	Nov. 7, 2015	Oct. 31, 2015

ID No.	Status	Location	Issue Description	Action Taken/Recommended	Date of Identification	Targeted Date for Completion	Date Completed
ULR#30	OPEN	ASTR04 – Haul road crossing	The silt fence on the downstream side of the WBC/road has failed. Runoff from the surface of the haul road is not conveyed in a ditch. As a result, flows concentrate in this location, which led to the silt fence failure.	<ol style="list-style-type: none"> 1. Repair the haul road drainage to direct water away from ASTR04 2. Remove failed silt fence ensuring material does not enter ASTR04, and replace it. 	Oct. 26, 2015	Nov. 7, 2015	
ULR#31	OPEN	ULRHEF- Downstream Tunnel Portal access road drainage ditches	Ditches are not collecting and transporting road runoff as intended due to the road grading along the lower ULRHEF tunnel portal access road and infilling of the ditch line.	<ol style="list-style-type: none"> 1. Clean out ditch line and re-grade road to convey water to the ditch line 2. Ensure water from the laydown area is drained/conveyed into the re-established ditch line. 	Oct. 26, 2015	Nov. 7, 2015	
ULR#32	CLOSED	Lillooet River FSR – KM48	The silt fence on the upstream side of the second WBC is 95% infilled with sediment and has previously failed.	Removed the sediment accumulation captured by the silt fence and replace the silt fence.	Oct. 26, 2015	Nov. 7, 2015	Oct. 30, 2015
ULR#33	CLOSED	River Right – ULRHEF intake	Infilled ditches require maintenance	<ol style="list-style-type: none"> 1. Clean-out the ditch above the river right cut slope to prevent further riling 2. Remove material that has infilled the ditch in sections along the access road 	Oct. 26, 2015	Nov. 7, 2015	Oct. 26, 2015
ULR#34	CLOSED	ULRHEF intake – Water treatment ponds	The flocculant treatment component of the water treatment ponds are not currently installed	Install flocculant treatment component of the ponds as outlined in the work plan to prevent further exceedances of BCWQGs when water discharges to the Lillooet River. Note: Turbidity of the discharge temporarily exceeded BCWQGs on Oct. 25, 2015.	Oct. 25, 2015	Nov. 7, 2015	Oct. 28, 2015
ULR#35	OPEN	Lillooet River FSR – KM45	Stockpiles along the edge of the FSR at ~KM45 of the Lillooet River FSR near the crushing/screening plant are not protected according to the ESC Plan.	<ol style="list-style-type: none"> 1. Install a ditch line along the forested edge of the stockpile (edge of the FSR) and install silt fencing to prevent the migration of sediment into the ditch line and/or the Mountain Goat replacement area immediately adjacent to the stockpile. 2. Remove accumulated sediment that has infilled the existing ditch line between the new spoil pile access road and the stockpiled material. 3. Clean out blocked culvert at the entrance to the active KM45 spoil area. (Identified Oct. 30, 2015) 	Oct. 27, 2015	Nov. 7, 2015	

ID No.	Status	Location	Issue Description	Action Taken/Recommended	Date of Identification	Targeted Date for Completion	Date Completed
ULR#36	OPEN	Covered Stockpiles at KM44.5 of the Lillooet River FSR	The stockpile tarp coverings are deteriorating and are no longer serving their original intent as a potential PAG rock temporary storage measure.	1. Remove the tarps if they are no longer required OR 2. Repair the tarps if they are still required (pending clarification on PAG vs non-PAG status)	Oct. 27, 2015	Nov. 7, 2015	
ULR#37	OPEN	Lillooet River FSR – KM44 to KM43.5	Ditches have been infilled with sediment and are missing in some sections	1. Remove accumulated sediment and restore the ditch line in areas where it is no longer continuous and/or where runoff is likely to erode the running surface.	Oct. 27, 2015	Nov. 7, 2015	
<i>(next ITM – #38)</i>							

9.2 Transmission Line

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



FIELD ADVICE MEMO (FAM)

Project:	Upper Lillooet Hydro Project	FAM Number: (yyyy-mm-dd_FAM##)	2015-10-26_FAM#5
FAM Author:	Tom Hicks, Lead Monitor Sartori Environmental Services	Date of FAM Issuance:	October 26, 2015
Distribution List: (Name - Company)	To: Jean Pelletier, Jordan Gagne & Ian McKeachie - CRT-ebc CC: Julia Mancinelli - Innergex, Stephen Sims - Sartori Environmental Services		
Environmental Incident Reports (EIR): (If applicable)	This FAM is not associated with an environmental incident. The ESC and water management concerns presented will be tracked in the Weekly Environmental Monitoring Report, and will be updated as the recommend works are completed. Each concern is assigned a number in the attached ITM table.		

Identified Environmental Issue(s):

This FAM has been prepared to outline key ESC and water management concerns and to highlight potential problem areas before they become significant issues resulting in erosion damage and the downstream transportation of sediment to receiving waters. CRT-ebc is responsible for developing and executing site specific ESC and water management plans to ensure continued adherence to site specific work plans, the Erosion Prevention and Sediment Control Plan, the Surface Water Quality Protection Plan, and the Ditch Management Plan. The IEM expects that these outstanding concerns will be addressed in a timely manner.

In summary, the majority of the ULHP sites appear to be stable under dry conditions, however a number of maintenance items are required prior to the onset of the rainy season. These items are summarized below in a series of photos overlain with sketches and in the ITM tracking table.

Requested Outcome(s)

Many of these items have been previously discussed during joint site tours conducted by the CRT-ebc Environmental Management team and the IEM team, and some of the repairs/upgrades/installations have started or are scheduled to start during this reporting period. The IEM requests that CRT-ebc provide a schedule to address the remainder of these items by October 29, 2015, and complete the repairs/upgrades/installations by November 7, 2015.

Environmental Issues Tracking Matrix (ITM)

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	
BDR#25	OPEN	Boulder Powerhouse water treatment ponds	Water from the fourth cell of the water treatment ponds is seeping out of the edge of the pond, flows over an active haul path, and along the edge of the powerhouse access road before infiltrating to ground	1. Remove sediment accumulations from cells 1 – 3 of the treatment ponds to promote infiltration as outlined in the work plan. OR 2. Ensure all flowing surface water seeping from the fourth pond is conveyed in armoured ditch lines and through road culverts.	October 26, 2015	November 7, 2015		
BDR#26	OPEN	Boulder Intake Access Road 4 – 5KM	Ditch installation and maintenance is required to ensure runoff is directed away from the running surface and is conveyed offsite clean, without being impacted by vehicle traffic	1. Install and armour ditch line from 4 -5 KM 2. Repair all damaged or infilled culvert inlets from 4-5KM	October 26, 2015	November 7, 2015		
BDR#27	OPEN	Boulder Intake Access Ramp	Ditches outlined in the work plan have not been installed and the haul path is conveying sediment and sediment laden water along the length of the ramp	Install ditches on either side of the access ramp and crown/cap road to ensure runoff is conveyed in the ditch lines and not along the running surface	October 26, 2015	November 7, 2015		
ULR#28	OPEN	Lillooet River FSR – KM41	The road edge eroded significantly during scaling activities and during the last major rain event and requires bank stabilization (above the HWM), ditch installation/maintenance, and silt fence repair.	1. Stabilize the road edge (above HWM) and rebuild the road in the eroded sections 2. Clean out and install ditch line along inside edge of the road and convey water across the running surface in drainage structures as needed 3. Repair silt fence along outer road edge	October 26, 2015	November 7, 2015		
ULR#29	OPEN	Lillooet River FSR ~ KM42 – KM42.5	Water in the ditch line is eroding the road edge	Formalize and armour the ditch line to protect the road edge from further erosion	October 26, 2015	November 7, 2015		
ULR#30	OPEN	ASTR04 – Haul road crossing	The silt fence on the downstream side of the WBC/road has failed. Runoff from the surface of the haul road is not conveyed in a ditch. As a result flows concentrate in this location, which led to the silt fence failure.	1. Repair the haul road drainage to direct water away from ASTR04 2. Remove failed silt fence ensuring material does not enter ASTR04, and replace it.	October 26, 2015	November 7, 2015		

ULR#31	OPEN	ULRHEF- Downstream Tunnel Portal access road drainage ditches	Ditches are not collecting and transporting road runoff as intended due to the road grading along the lower ULRHEF tunnel portal access road and infilling of the ditch line.	<ol style="list-style-type: none"> 1. Clean out ditch line and re-grade road to convey water to the ditch line 2. Ensure water from the laydown area is drained/conveyed into the re-established ditch line. 	October 26, 2015	November 7, 2015	
ULR#32	OPEN	Lillooet River FSR – KM48	The silt fence on the upstream side of the second WBC is 95% infilled with sediment and has previously failed.	Removed the sediment accumulation captured by the silt fence and replace the silt fence.	October 26, 2015	November 7, 2015	
ULR#33	OPEN	River Right – ULRHEF intake	Infilled ditches require maintenance	<ol style="list-style-type: none"> 1. Clean-out the ditch above the river right cut slope to prevent further riling 2. Remove material that has infilled the ditch in sections along the access road 	October 26, 2015	November 7, 2015	
ULR#34	OPEN	ULRHEF intake – Water treatment ponds	The flocculant and pH treatment components of the water treatment ponds are not currently installed	Install the pH and flocculant treatment components of the ponds as outlined in the work plan to prevent further exceedances of BCWQGs when water discharges to the Lillooet River. Note: Turbidity of the discharge temporarily exceeded BCWQGs on October 25, 2015.	October 25, 2015	November 7, 2015	

PHOTOS: AREAS REQUIRING IMPROVED EROSION AND SEDIMENT CONTROL & WATER QUALITY MANAGEMENT



BDR#25. Water from the fourth cell of the water treatment ponds is seeping out of the edge of the pond, flows over an active haul path, and along the edge of the powerhouse access road before infiltrating to ground



ULR#26. Ditch installation has started along the Boulder intake access road between 4 – 5KM. Ditches should continue to be installed along this section of road and all culvert inlets should be inspected and maintained as required. Note: Equipment should not park in the ditch lines.



BDR#27. Ditches outlined in the work plan have not been installed and sediment/sediment laden water are flowing over the running surface along the length of the ramp



ULR#28. The road edge eroded significantly during scaling activities and during the last major rain event and requires bank stabilization (above the HWM), ditch installation/maintenance, and silt fence repair.



ULR#29. Water in the ditch line is eroding the road edge



ULR#30. The silt fence on the downstream side of the WBC/road at ASTRO4 has failed. Runoff from the surface of the haul road is not conveyed in a ditch. As a result flows concentrate in this location, which led to the silt fence failure.



ULR#31. Ditches are not collecting and transporting road runoff as intended due to the road grading along the lower ULRHEF tunnel portal access road and infilling of the ditch line. Surface runoff is not conveyed in ditch lines and discharges sediment laden water directly to Truckwash Creek during rain events.



ULR#32. The silt fence on the upstream side of the second WBC is 95% infilled with sediment and has previously failed (KM48 of the Lillooet River FSR).



ULR#34. The flocculant and pH treatment components of the water treatment ponds are not currently installed