



Upper Lillooet Hydro Project

Weekly Environmental Monitoring Report #112

Reporting Period: March 1 – 31, 2017

Upper Lillooet River Hydroelectric Facility (Water File No. 2002561, Water Licence No. C130613), Boulder Creek Hydroelectric Facility (Water File No. 2003049, Water Licence No. C129969) & Transmission Line (TX Line)

Distribution List		Prepared By
Name	Organization	
Brian Naito	Fisheries and Oceans Canada	 J. Alex Sartori, RPBio <i>Independent Environmental Monitor (IEM)</i>  J. Stephen Sims, RPBio <i>Delegate IEM</i>
James Davies	MFLNRO – Water Allocation	
Joanne DeGagne	MFLNRO – Land and Resources	
Frank DeGagne	MFLNRO – Land and Resources	
Michael Shepard	BC Environmental Assessment Office	
Gregory Wittig	BC Environmental Assessment Office	
George Steeves	True North Energy – Independent Engineer	
Jennifer McCash	JEM Energy Ltd. – Independent Engineer	
Thomas Hicks	Sartori Environmental Services	
Oliver Robson	Innergex Renewable Energy Inc.	
Grant Lindemulder	Innergex Renewable Energy Inc.	
Julia Mancinelli	Innergex Renewable Energy Inc.	
Colleen Giroux-Schmidt	Innergex Renewable Energy Inc.	
Matt Kennedy	Innergex Renewable Energy Inc.	
Renaud DeBatz	Innergex Renewable Energy Inc.	
Richard Blanchet	Innergex Renewable Energy Inc.	
Matthew Wright	Innergex Renewable Energy Inc.	
Serge Moalli	CRT-ebc Construction Inc.	
Jonathan Drapeau	CRT-ebc Construction Inc.	
Simon Munneke	CRT-ebc Construction Inc.	
D'Arcy Soutar	Westpark Electric Ltd.	
Pontus Lindgren	Westpark Electric Ltd.	
Harriet VanWart	Lil'wat Nation	
Carrie Lester	Lil'wat Nation	
		Date Prepared: October 21, 2017 Date Submitted: October 27, 2017

Owner Construction Permits and Approvals

Environmental Assessment Certificate No. E13-01 (Amendment 1, 2, 3, 4, 5, 6, 7)
 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
 Leave to Commence Diversion (ULRHEF) File No. 2002561
 Leave to Commence Diversion (BDRHEF) File No. 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 & Modification Agreement (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) No. L49717 (Amendments 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11)
 Occupant Licence to Cut (BDRHEF – KM38 laydown) No. L49698
 Occupant Licence to Cut (BDRHEF) No. L49816 (Amendments 1, 2, 3, 4)
 Occupant Licence to Cut (TX Line) No. L49697 (Amendments 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11)
 General Wildlife Measure Exemption Approval Letter (TX Line & BDRHEF) File No. 78700-35/06 UWR and 39585-20 WHA
 Ground Water Licence (ULRHEF C50114) File No. 20003228
 Ground Water Licence (BDRHEF C500112) File No. 20003239
 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
 Section 8 - Special Use Permit issued for the operation of an avalanche weather station on Crown land (File No. S25988)
 Special Use Permit issued for construction of the Lillooet River FSR KM48 bypass road on Crown land (File No. S26115)
 Vancouver Coastal Health Letter of Certification (23966) Boulder Creek Powerhouse Sewerage System
 Vancouver Coastal Health Letter of Certification (23966) Upper Lillooet Powerhouse Sewerage System

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. 349424 (Renewal 2)
Wildlife Act Permits – Pacific Tailed Frog Salvage Permit # SU15-164805; SU17-262991; 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
Water Sustainability Act Section 10(1) Use Approval dated March 24, 2016
Section 7 Explosives Act – Magazine Licence (U76018) Renewal April 30, 2016
Magazine Licence File No. UL76018 (Renewal 1, 2)
Section 8 Approval – Short Term Use of Water File (Lillooet River and Tributaries) No. A2006123 (Amendment 1)

ACRONYMS:

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

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	Key Monitoring Locations & Activities
March 1 – 31, 2017	TH, SE	<p>Construction Camp, Laydown Areas and the Lillooet River FSR</p> <ul style="list-style-type: none"> • Road maintenance and snow removal on the Lillooet River FSR • Snow removal and creation of wildlife escape gaps every 100m on the Lillooet River FSR • Maintaining parking areas to facilitate activities of the local trapline holder at designated areas along the Lillooet River FSR • Demobilizing equipment from the KM38 Laydown <p>ULRHEF Intake & Upstream Tunnel Portal</p> <ul style="list-style-type: none"> • Wet commissioning <p>ULRHEF Downstream Tunnel Portal</p> <ul style="list-style-type: none"> • Penstock works are complete; final reclamation will occur once conditions permit <p>ULRHEF Penstock</p> <ul style="list-style-type: none"> • Penstock works are complete; final reclamation will occur once conditions permit <p>ULRHEF Powerhouse</p> <ul style="list-style-type: none"> • First conveyance of water through the generating equipment • Completion of dry commissioning and start of wet commissioning on Unit 1 <p>BDRHEF Intake & Upstream Tunnel Portal</p> <ul style="list-style-type: none"> • Electrical works associated with dry commissioning <p>BDRHEF Downstream Tunnel Portal</p> <ul style="list-style-type: none"> • Concrete works for the bifurcation were completed • Steel tunnel liner cellular concrete injection was completed • Cleaning and flushing of the steel tunnel liner • Decommissioning of the first 3 cells of the infiltration ponds <p>BDRHEF Powerhouse</p> <ul style="list-style-type: none"> • Dry commissioning and electrical works. <p>TX-Line</p> <ul style="list-style-type: none"> • No activities

IEM Team Personnel: TH – Tom Hicks; SE – Stephanie Ellis

2.0 Administrative Summary

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

Date	Communication Type	Participants	Issues Discussed	ITM ID No.
March 2	Email	SES, MFLNRO, INX, CE	The IEM provided notification to MFLNRO of the sighting of two mountain goats on the Lillooet River FSR at KM46. The two mountain goats were seen (at approximately 8am on February 28, 2017) standing in the middle of the FSR by a pick-up truck travelling down the FSR. The pick-up truck driver stopped once the goats came into view and saw them travel directly uphill through the snow. The goats did not appear distressed according to the observer.	-

Date	Communication Type	Participants	Issues Discussed	ITM ID No.
March 6	<i>Conference Call</i>	INX, SES, Ecofish	A conference call was held to coordinate monitoring activity and confirm monitoring criteria for wet commissioning works.	-
March 9	<i>Emails</i>	SES, INX	The IEM requested confirmation from INX that the commissioning works at the BDRHEF intake were being completed without snow plowing beyond the gate (within 500m of Mountain goat UWR), and that activities did not involve loud construction equipment and were confined to electrical work within the intake control room. INX confirmed that the works were confined to the intake control building and/or would involve pre-commissioning related checks that do not involve loud construction.	-
March 10	<i>Email</i>	CE, INX, SES	RE: INN-2056E: Notice of Activity – BDR tunnel penstock flushing – CE informed INX and the IEM that they would conduct the first flush of the BDR tunnel on March 11, 2017. The Kickoff meeting was scheduled for 9 am on March 11 with the flush to immediately follow.	-
March 10	<i>Email</i>	INX, SES	INX provided the IEM with the weekly ULRHEF commissioning reports issued to date.	-
March 20, 26, & 30	<i>Emails</i>	CE, SES	CE provided the IEM with notification of controlled burning at the KM38 Laydown and provided confirmation that their burning registration was renewed and valid until April 3.	-
March 20	<i>Email</i>	INX, Ecofish, SES, JEM	INX provided notification of the start of the 72 hour reliability test for unit 1 of the ULRHEF and requested that Ecofish complete the Connectivity Study during the test to be completed at the Licensed IFR level.	-
March 30	<i>Email</i>	JEM, INX, SES, MFLNRO	The IEM was forward the Leave to Commence Diversion (LTCD) for the BDRHEF issued by MFLNRO	-

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
Lillooet River FSR, ULRHEF, & BDRHEF intake	Access roads above the lower limit of the 200m buffer to the Truckwash Creek Migration Corridor to the ULRHEF intake, as well as a portion of BDRHEF intake access road and intake structure within UWR u-2-002 UL 12	Mountain Goat UWRs & Migration Corridor	<p>The mountain goat monitoring program ended on December 16 as all construction activities at the ULRHEF lower tunnel portal and the ULRHEF intake are complete.</p> <p>During winter months (November 1 – April 30), access to BDRHEF intake must be gated at least 500 m from UWR to restrict motorized use within the UWR, unless otherwise directed by MFLNRO.</p> <p>All BDRHEF intake works and construction, in or within 500 m of UWR u-2-002 UL 12, will not occur from November 15 to April 30.</p> <p>NOTE: BDRHEF intake is now in the commissioning phase and all construction activities are complete.</p>

Component	Location	Wildlife/Archeology Concern	Construction/Timing Restrictions & Mitigations
			If a mountain goat is observed within 500m line of sight of construction operations, construction must cease for at least 48 hours. Approval from the IEM must be obtained prior to recommencing construction activities, and the IEM must record and submit all goat observations to MFLNRO within 48 hours.
TX Line	All Segments	Mountain Goat UWRs SO-04 & SO-08	If a mountain goat is observed within 500m line of sight of construction operations, construction must cease for at least 48 hours. Approval from the IEM must be obtained prior to recommencing construction activities, and the IEM must record and submit all goat observations to MFLNRO within 48 hours.

4.0 Upper Lillooet River HEF – Monitoring Results

4.1 *Construction Camp, KM38 Laydown, Access Roads & Lillooet River FSR*

Construction Activities:

- CE continued routine fuel management and maintenance of construction equipment within the mechanic shop at the KM38 laydown. CE temporarily stored all hazardous substance materials (waste oil, contaminated soil, used oil/hydraulic fluid containers, etc.) in a designated area at the laydown prior to off-site disposal. The materials were all well contained and protected from the weather.
- CE continues to demobilize equipment and materials from the KM38 and work areas around site (Photo 1). Controlled burning of wood waste material at the KM38 laydown area is occurring when burning indices allow according to CE’s burning permit.
- Snow removal on the Lillooet River FSR and site access roads continued throughout this reporting period. (Photo 2). Weekly site inspections were performed by the IEM to assess snow clearing activities.

Environmental Summary:

- Snow management around the waste compactor, electric fences, and construction camp facilities were performed to maintain their operation following heavy snowfall during this reporting period. CE continues to remove snow and repair the electric fence following each snowfall (Photo 3). Wildlife escape gaps were created and maintained every 100m along the FSR as soon as possible after every storm system.
- The IEM inspected snow plowing operations, and noted that ungulate escape routes had been plowed through the snow banks of the FSR and were being maintained.

Photos:



Photo 1 – Demobilization of construction equipment (March 22, 2017).



Photo 2 – Snow clearing and maintenance of the Lillooet River FSR (March 22, 2017).



Photo 3 – Maintenance and snow removal around the construction camp electric fence (March 22, 2017).

4.2 ***Intake Wet Commissioning***

Commissioning Activities:

- Commissioning activities continue. All construction related activities are complete. Final site reclamation will occur once snow levels recede.

Environmental Summary:

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

4.3 Downstream Tunnel Portal

Construction Activities:

- Site demobilization was complete as of December 15, 2016.

Environmental Summary:

- CE has demobilized from the ULRHEF Downstream Tunnel Portal. Reclamation works will recommence in 2017 following the spring thaw. As a result the Mountain Goat Monitoring Program is complete (See Section 8.8.0 for further details)

4.4 Penstock and Truckwash Creek Penstock Crossing

Construction Activities:

- All construction activities are complete. Final reclamation works will be completed once snow levels recede.

Environmental Summary:

- CE will replant the section of the reclaimed area adjacent to Truckwash Creek that was damaged in the flood in the spring of 2017 when the conditions permit.
- Soils (organics and mineral soil) were mixed with snow and placed on an access path constructed to perform Truckwash Creek over-drain repairs. This material is placed on the permanent penstock access road and in the riparian area of Truckwash creek. This material was not removed upon completion of the Truckwash Creek repairs, as it was compacted and posed no ESC concern. The area will be monitored in the spring of 2017 to determine if the material needs to be removed. This item will be tracked in the Issue Tracking Matrix (ITM ULR #64), until an assessment of the area is performed.

4.5 Powerhouse, Tailrace & Access Road

Construction Activities:

- First release of water from the conveyance system through the EDS to the Lillooet River (Photo 4 & 5).
- Electrical works in the ULRHEF powerhouse.
- Wet commissioning will continue in stages for all generating Units. QPs will be present onsite to conduct sensitive fish stranding site searches during inadvertent ramping events that may occur during the commissioning phase.
- Ecofish (QP) completed the Connectivity Study during the 72 hour reliability test completed from March 26 - 28, 2017.

Environmental Summary:

- On March 2, INX tested the water conveyance system allowing water to flow from the tunnel through the EDS structure into the tailrace and into the Lillooet River (Photo 5).

The IEM monitored the release of water and collected water samples for heavy metal analysis, all water samples were below BCWQG for heavy metals. The IEM also monitored downstream water quality during the release and did not observe any increase in turbidity. Detailed water quality sampling results are available upon request.

Photos:



Photo 4 – Condition of the ULRHEF powerhouse during the first water release (March 2, 2017).



Photo 5 – First water release from the ULRHEF powerhouse to the Lillooet River (March 2, 2017).

4.6 ***Water Quality Results***

The IEM has suspended the routine water quality monitoring program as current activities pose low risk of negativity impacting water quality in the Lillooet River. Water quality monitoring was performed during all construction activities that had the potential to affect downstream water quality; including first release of water to the Lillooet River through the ULRHEF water conveyance. Samples were submitted for analysis of metals and hydrocarbon content. No exceedance of BCWQGs were measured during the first release of water from the water conveyance system. Detailed water quality sampling results are available upon request. Any instream works or works with the potential to affect downstream water quality will continue to be monitored by the IEM during the commissioning period.

4.7 ***Recommendations***

IEM recommendations for the ULRHEF are as follows:

- CE should ensure that escape routes are plowed through snow berms along road edge at approximately 100 meter intervals to allow ungulates safe passage off of the FSR and worksite access roads.
- CE should ensure that all intersections used by the local trapper and public are cleared of snow with adequate room for parking according to the snow clearing plan. The IEM understands that snow clearing following significant snow fall will be completed as soon as possible.

4.8 ***Upcoming Works***

The following new and/or environmentally sensitive construction activities are scheduled to occur at the ULRHEF:

- Reclamation of the spoil pile at KM 42.5.
- Snow removal and clearing of escape gaps along all areas of the Lillooet River FSR and access roads.
- Wet commissioning of mechanical gates, turbines, and generating equipment in the ULRHEF powerhouse.
- Verification of temporary and Licenced IFR flow volumes.
- Repairs to road edge of the Lillooet River FSR (multiple sections between KM46 & KM48) remain outstanding and present as ESC risk once the spring melt begins. Any mobilization of side cast material during the spring melt will need to be re-assessed and the slopes repaired/stabilized prior to further erosion in the spring of 2017 (ULR#60).
- Road widening and raising from KM 41.5 – 42.75 on the Lillooet River FSR.
- Mixed material placed on the permanent penstock access road (organics, soils, and snow) are to be assessed and removed if they present an ESC risk before spring melt begins in 2017 (ULR#64).
- Site wide reclamation activities will continue once snow recedes in the spring.

5.0 **Boulder Creek Hydroelectric Facility – Monitoring Results**

5.1 ***Access Road & Intake***

Construction Activities:

- Electrical work associated with commissioning inside the control room at BDRHEF Intake.

Environmental Summary:

- The construction phase of works at the BDRHEF Intake is complete. A small team of electricians continue to perform electrical works inside the control room building and dry commissioning activities.
- As no plowing is allowed in UWR u-2-002 UL12 during the sensitive winter months BDRHEF Intake is accessed by Snowcat.

5.2 ***Downstream Tunnel Portal and Powerhouse***

Construction Activities:

- Steel tunnel liner cleaning and flushing (Photo 6 - 8).
- Completion of cellular concrete injection in the tunnel and the backfilling of the concrete encasement of the bifurcation pipe (Photo 9).

- Decommissioning of the first three cells of the infiltration ponds (Photo 10).
- Electrical work in the BDRHEF powerhouse (Photo 11).

Environmental Summary:

- On March 11, CE conducted the first flush to clean the BDRHEF steel tunnel liner (Photo 6). Approximately 10,000L of water was used to flush the penstock floor, removing excess coating, welding debris, and sediment. All flushing water was captured at the bottom of the penstock and stored in 1000L containers (Photo 6 - 8). Water samples were collected during the initial flush and at the end of the flush to confirm that water quality met BCWQGs for the protection of aquatic life. Water samples were analyzed for hydrocarbon and metal content. The penstock flushing water samples were stored onsite until lab results were received by the IEM. Samples results confirmed that the flush water could be release to the infiltration ponds. Sediments within the infiltration ponds will be sampled during the prior to decommissioning them to ensure sediments meet applicable BC CSR guidelines.
- Bifurcation encasement rebar, formwork and concrete works were completed and the concrete is backfilled (Photo 9).
- The mobile concrete batch plant was used to produce cellular concrete for the encasement of the steel tunnel liner. Cellular concrete is in the process of curing and the mobile batch plant has been removed from site (Photo 9).
- CE began decommissioning of the sediment infiltration ponds during this period (Photo 10). The sediments within the infiltration ponds were sampled and submitted for laboratory analysis prior to decommissioning to confirm that sediment meet the BC CSR guidelines for wildland sites. Water seeping from the tunnel continues to be directed to the last pond and continues to infiltrate to ground.
- Electrical work in the BDRHEF powerhouse (Photo 11).

Photos:



Photo 6 – Flushing water flowing down the BDRHEF steel tunnel liner (March 11, 2017).



Photo 7 – 1000L tote with a 2" pump used to capture all flushing water (March 11, 2017).



Photo 8 – 1000L totes used to store flushing water until water quality results were received (March 11, 2017).



Photo 9 – BDRHEF tunnel portal. Cellular concrete and bifurcation concrete curing is occurring (March 30, 2017).



Photo 10 – CE began decommissioning the first three cells of the infiltration ponds (March 30, 2017).



Photo 11 – BDRHEF powerhouse electrical works (March 30, 2017).

5.3 *Water Quality Results*

The IEM has suspended the routine water quality monitoring program as current construction activities pose low risk of negativity impacting water quality in Boulder Creek. Water quality monitoring will continue to be performed during any instream works or works with the potential to affect downstream water quality. The last cell of infiltration ponds at the Boulder Powerhouse continue to receive water which infiltrates to ground. No construction or commissioning activities were performed during this monitoring period that had the potential to affect surface water quality of Boulder Creek.

5.4 *Recommendations*

IEM recommendations for the BDRHEF are as follows:

- CE should continue to direct all construction related wastewater to the lower tunnel portal settling ponds. CE should continue to monitor the settling/infiltration pond to ensure that

it remains in good working condition, and perform all maintenance activities as outlined in the work plan. If water begins to discharge offsite, CE should conduct regular inspections to ensure that it meets BCWQGs prior to connection with the Boulder Creek side channel.

- CE should continue to remove garbage from both the BDRHEF powerhouse and intake as they demobilize equipment.
- As steel liners are removed from the laydown and installed into the BDRHEF downstream tunnel portal; observed hydrocarbon contaminated soils underneath the liners should be cleaned up and removed as required to prevent attracting wildlife (ULR#58).
- CE to provide an update to the design for the drainage ditch that was installed that bisects six identified ephemeral drainage paths along the conduit alignment between the BRDHEF intake access road and the BDRHEF powerhouse. The IEM is awaiting a final drainage design to be presented for this section of the conduit alignment prior to CE completing any necessary repairs that will be performed once snow levels recede (ULR#63).

5.5 *Upcoming Works*

New and/or environmentally sensitive construction activities scheduled to occur at the BDRHEF in April 2017:

- Final grading and drainage works.
- Contouring of the BDRHEF powerhouse spoil pile.
- Decommissioning of the BDRHEF lower portal sediment ponds will continue.
- Wet commissioning on the intake gates, water conveyance system, turbines, and generating equipment.

6.0 **Transmission Line – Monitoring Results**

6.1 *Transmission Line Construction Activities*

Construction Activities:

- No construction activities occurred during the reporting period. Works will resume once snow levels recede.

Environmental Summary:

- There were no works along the Transmission Line that required IEM environmental monitoring during this reporting period.

6.2 *Recommendations*

IEM recommendations for the Transmission Line are as follows:

- WEL's Environmental Manager continues to provide regular scheduling updates that permits the IEM to assess environmental risks and coordinate monitoring requirements.

WEL should continue to provide the IEM with a minimum of 48 hours' notice if IEM presence is required or expected for construction activities.

6.3 *Upcoming Works*

New and/or environmentally sensitive construction activities scheduled to occur along the Transmission Line alignment in 2017:

All Segments

- Seasonal and permanent road de-activation works.
- Reclamation and planting within sensitive wildlife areas.

7.0 **Wildlife Sightings**

As per the CEMP, the IEM implemented a wildlife sightings record. Project Personnel are required to regularly update the record and it is mandatory for all personnel to report wildlife sightings including, but not limited to bears, cougars, mountain goats and deer. 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 March 2017:

Upper Lillooet Hydro Project - Wildlife Observation Form					
Date	Time	Observer (Company)	Species or Description	Location	Comments
12/03/2017	9:40	Jean M. Pelletier	Grouse	km 42	on the road

8.0 **Mountain Goat Monitoring Program**

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

- The BDRHEF intake access road is gated to restrict motorized public access to the UWR (UL-12). Construction activities at the BDRHEF intake are now complete. Commissioning activities will involve electrical works inside the control room, and will not involve loud construction activities.
- All construction activities within the Truckwash Creek mountain goat migration corridor and at the ULRHEF intake are now complete (as of December 15, 2016). These areas are now

in the commissioning phase and no loud construction activities within 500m of sensitive mountain goat UWR are planned for 2017. The ULHP mountain goat monitoring program is now complete.

- To mitigate potential impacts to mountain goats during the sensitive winter period, construction activities will cease if a mountain goat(s) is (are) observed moving towards the ULRHEF intake and/or if a mountain goat(s) is (are) observed within a 500m line of site of a construction activity. No mountain goats were observed within 500m line of sight of construction activities and no work stoppages were required during this monitoring period.

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
ULR#58	OPEN	All work areas	Conservation Officer and BCEAO Compliance and Enforcement Officer Inspection noted non-compliance with regard to wildlife attractant management.	1. Develop, implement and document internal waste and attractant management auditing tool. Tool will be available for use by the IEM and CE's EM Team. Records of inspections and noted non-compliances should be tracked internally with clean-up documented in each report. This tracking tool will be available to agencies upon request. This tool should be used similarly to the Spill Reporting tool currently being employed onsite.	July 6, 2016	July 9, 2016	July 8, 2016
				2. Repair and adjust the electric fences and charged entrance mats at the construction camp (perimeter fence, camp kitchen fence, and waste compactor fence) and surrounding the septic field.			July 21, 2016
				3. Install self-closing door hinges in all site lunchrooms and anywhere food is being stored temporarily (lunch rooms, kitchen storage area) OR adjust how food is transported, stored and consumed onsite to eliminate the possibility of food and food waste attractants onsite.			July 21, 2016
				4. Perform maintenance to clean-up grease and liquid waste around and underneath the garbage compactor			July 21, 2016
				5. Install berms surrounding parking areas that are lined with impermeable fabric in areas where tunneling equipment is parked. All leaks could be considered wildlife attractants; therefore all leaky equipment should be repaired and leaks or spills to ground in parking areas must be cleaned up daily and be disposed of in appropriate contaminated soil bins. Update January 10 – Steel tunnel liner has been stored over the area where leaks on the pad remain to be cleaned up. This area is currently snow covered. As the steel liners are moved and snow is cleared, any observed hydrocarbon contaminated soils should be cleaned up and removed as required to prevent attracting wildlife. This item remains open as hydrocarbon staining in the parking areas near the BDRHEF powerhouse has yet to be documented as fully cleaned-up.			Open

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
ULR#60	OPEN	Lillooet River FSR from 46 – 48 Km	The road fill slope of the Lillooet River FSR between KM46 – KM48 requires ESC measures to ensure slope stability and prevent rill erosion from transporting material into the forested area below.	1. Assess the road fill slope conditions following conduit installation in the Lillooet River FSR in this section. Update September 30, 2016: CE and the IEM have assessed areas of concern and have discussed ESC stabilization/reclamation of the slopes by hydro-seeding with alder and hydro-mulch of appropriate strength (BFM) and at sufficient application rate.	August 8, 2016	August 16, 2016	September 30, 2016
				2. Provide and implement an agreed upon plan to protect the slope from an erosion and sediment transport perspective and/or a plan to initiate reclamation of the impacted area. Update December 8, 2016 – CE failed to address this concern and now snow and weather will prevent hydro-seeding from occurring this year. Repairs to road edge also remain outstanding and present as ESC risk once the spring melt begins. Any mobilization of side cast material during the spring melt will need to be re-assessed and the slopes repaired/stabilized prior to further erosion in the spring of 2017.			Open
ULR #63	OPEN	Conduit alignment between the BDRHEF intake access road and BDRHEF powerhouse along TX Line ROW.	Drainage paths interrupted by conduit installation have resulted in significant erosion and does not conform to the work plan or design.	1. The work plan and design of the power and tech cable conduit between the BDRHEF intake access road and the BDRHEF powerhouse called for the installation of swales at all ephemeral drainage paths. The work plan and design were not implemented resulting in substantial erosion along the conduit alignment and along two of the TX Line temporary access roads. An updated drainage plan should be prepared and installed to prevent further erosion. Update January 10 - A drainage ditch was installed that bisects six identified ephemeral drainage paths along the conduit alignment without notification to the IEM. The IEM has requested an update on when the work was performed and to what end, as this ditch does not currently meet the design. The IEM is awaiting a final drainage design to be presented for this section of the conduit alignment.	November 10, 2016	November 17, 2016	Open

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
ULR #64	OPEN	Penstock access road and riparian area on the left bank of Truckwash Creek	Organics, mineral soils, and snow were mixed during construction of an access path on the left bank of Truckwash Creek	<p>1. Soils (organics and mineral soil) were mixed with snow and placed on an access path constructed to perform Truckwash Creek over-drain repairs. This material is placed on the permanent penstock access road and in the riparian area of Truckwash creek, which will need to be reclaimed in 2017. The mixed material (organics, soils, and snow) are to be removed upon completion of the penstock over-drain repair works, to eliminate the ESC risk.</p> <p>Update January 10 – This material was not removed upon completion of the Truckwash Creek repairs. The area should be monitored in the spring of 2017 until the mixed materials are removed from the penstock access road.</p>	December 1, 2016	Upon completion of Truckwash Creek over-drain repairs	Open
<i>(next ITM – BDR#28 & ULR#66)</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>							