



Upper Lillooet Hydro Project

Weekly Environmental Monitoring Report #110

Reporting Period: January 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 20, 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
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
January 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 • 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 <p>ULRHEF Intake & Upstream Tunnel Portal</p> <ul style="list-style-type: none"> • Intake dry 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"> • Mechanical and electrical works associated with dry commissioning <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"> • Foundation preparation and flushing pipe installation • Concrete works for the flushing pipe • Tunnel plug steel-concrete contact grouting • Steel tunnel liner installation <p>BDRHEF Powerhouse</p> <ul style="list-style-type: none"> • Electrical work <p>TX-Line Segment 9</p> <ul style="list-style-type: none"> • Demobilizing equipment from the Salmon main.

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.
January 6	<i>Kick-off Meeting</i>	CE, SES, INX	A kick-off meeting was held to discuss the BDRHEF tunnel liner installation work plan. Key environmental aspects discussed included dewatering of tunnel seepage to the infiltration ponds.	-
January 8	<i>Kick-off Meeting</i>	CE, SES, INX	A kick-off meeting was held to discuss the steel-concrete contact grouting procedure at the BDRHEF tunnel plug. Key environmental aspects discussed included dewatering of tunnel seepage to the infiltration ponds and setup of grouting equipment.	-
January 10	<i>Email</i>	SES, INX, CE, JEM	The IEM circulated an update to the Issue Tracking Matrix. There are a number of ongoing issues that should be resolved in Spring 2017 as the snows recede.	-

Date	Communication Type	Participants	Issues Discussed	ITM ID No.
January 11	<i>Email</i>	INX, SES	INX provided the Coastal Tailed Frog Salvage Report for Construction of the Upper Lillooet Hydro Project - 2015 and 2016 Permit SU15-164805, and notification that the report was submitted to the Wildlife Species Inventory website.	-
	<i>Email</i>	BC EAO, INX, SES	INX received correspondence from the BC EAO regarding access difficulties experienced by the local trap line holder over the winter break in late December. INX responded that the small crew over the winter break had difficulties keeping the road open and pull outs accessible with the large number and amounts of snow fall experienced. Crews were now fully back onsite and reminded of the importance of clearing secondary pull outs and access to facilitate the operations of the local trapper once the main road is cleared (the Lillooet River FSR is a safety/egress priority). Two site inspections by the IEM were conducted to assess snow plowing conditions and a follow-up phone meeting was scheduled on January 12 to discuss the concerns with the local trapline holder and provide him with an update on the conditions onsite.	-
January 12	<i>Conference Call</i>	INX, CE, SES, local trapline holder	A conference call was held with the local trapline holder to discuss snow removal operations and a prioritized list of secondary areas to be cleared to facilitate trapline access for the local trapline holder. Four main areas were identified and solutions were presented to ensure trapping activities would not be negatively impacted.	-
January 19	<i>Email</i>	INX, CE, SES, local trapline holder	INX provided the local trapline holder with an avalanche hazard and snow clearing update heading into the weekend to help inform his trapping activities.	-
January 20	<i>Email</i>	INX, CE, SES, local trapline holder	INX provided the local trapline holder with an update that avalanche control works at KM26 of the Lillooet River FSR has left the road impassable. It is expected to take multiple days to re-open the road.	-
January 23	<i>Email</i>	INX, CE, SES, local trapline holder,	INX provided confirmation that the avalanche debris had been cleared at KM26 of the Lillooet River FSR and that the road was once again passable with winter driving conditions in effect.	-
January 26	<i>Email</i>	SES, INX, CE, JEM	The IEM provided the results of the monthly IE/IEM site inspection conducted on January 25. The IEM suggested four areas requiring snow clearing improvements to ensure snow clearing activities do not block wildlife, public, or local trapper access beyond the snow clearing limits.	-
January 31	<i>Kick-off Meeting</i>	CE, SES, INX	A kick-off meeting was held for the ULRHEF headpond filling operation. Ramping rate, calculated filling rate, stream gauging status, communications plan and mechanical procedures were reviewed and discussed with all parties.	-

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> <p>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.</p>
TX Line	All Segments	Mountain Goat UWRs SO-04 & SO-08	<p>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.</p>

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.
- 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 after every storm system.
- On January 11, INX and the IEM received correspondence from the BC EAO regarding access difficulties experienced by the local trap line holder over the winter break in late December. The small snow clearing crew working over the winter holiday season had difficulties keeping up with the amount and frequency of snowfall. Crews began to return to site in early January and snow clearing capacity was increased. A follow-up conference call was held with INX, SES, local trapper, and CE on January 12, 2017, which identified areas of priority for the local trapline holder. CE committed to clearing these areas as soon as possible following a snowfall and communicated that only the maintenance of a safe egress route from the construction site would take precedence over the clearing of the four (4) areas identified by the trapline holder.
- On January 20, a large avalanche was triggered during avalanche control works at KM26 of the Lillooet River FSR (Photo 4). The avalanche control works were performed to mitigate the risk to the safety of the public and construction crews travelling the Lillooet River FSR by controlling the timing of the avalanche, which was at risk of releasing naturally. The avalanche reached the Lillooet River FSR, fully blocking vehicle passage until January 23 when notice was provided that the road was re-opened.

Photos:



Photo 1 – Gaps in snow plowing sufficiently spaced through the mountain goat migration corridor (January 3, 2017).



Photo 2 – Snow removal activities at KM46.5 on the Lillooet River FSR (January 3, 2017).



Photo 3 – Workers remove snow from the electric fence as soon as possible following storm events (January 3, 2017).



Photo 4 – Large avalanche and debris flow blocking Lillooet River FSR following avalanche at KM26.5 (January 20, 2017)

4.2 Intake Dry Commissioning

Construction Activities:

- Intake dry commissioning works (gates, lockouts, trash rack rakes and other various components) in preparation for headpond filling which will begin February 1 (Photo 6).

Environmental Summary:

- A kick-off meeting for headpond filling was held on January 31. The work plan was reviewed with all contractors/consultants to clearly identify roles and responsibilities, decision making procedures, filling rates, communications protocols, and to address any questions.
- No environmental issues were observed or reported at the ULRHEF Intake during this reporting period.

Photos:



Photo 5 – Continued snow removal at the ULRHEF intake to facilitate dry commissioning (January 25, 2017)



Photo 6 – All river flows continued pass through the sluice gate during the reporting period (January 12, 2017).

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 8.0 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 spring 2017 flood 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:

- Mechanical and electrical works in the ULRHEF powerhouse.
- Second stage rebar and concrete works in the ULRHEF powerhouse (Photo 8).

Environmental Summary:

- Works were contained within the powerhouse structure throughout the monitoring period and posed low environmental risk.

Photos:



Photo 7 – Concrete pour within the ULRHEF Powerhouse (January 12, 2017).



Photo 8 – Conditions of the switchyard at powerhouse area (January 12, 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 will continue to be performed during any instream works or works with the potential to affect downstream water quality. No construction or commissioning activities were performed during this monitoring period that had the potential to affect surface water quality of the Lillooet River.

4.7 ***Recommendations***

IEM recommendations for the ULRHEF are as follows:

- CE should ensure that escape gaps are plowed in road side snow berms at approximately 100 metre 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 in the upcoming weeks:

- Snow removal and clearing of escape gaps along all areas of the Lillooet River FSR and access roads.
- Dry commissioning of the intake gates.
- Headpond and waterway filling.

- 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).
- 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 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 (Photo 9).

Photos:



Photo 9 – Conditions at the entrance of the BDRHEF intake access road. No plowing has occurred (January 12, 2017).

5.2 Downstream Tunnel Portal and Powerhouse

Construction Activities:

- Steel tunnel liner installation (Photo 11).
- Tunnel plug rebar, formwork and concrete works.

- Electrical work in the BDRHEF powerhouse **Error! Reference source not found..**

Environmental Summary:

- CE conveyed all wastewater related to the BDRHEF tunnelling works to the downstream settling ponds for treatment throughout the monitoring period (Photo 10). All water continues to infiltrate to ground.
- The IEM did not observe any environmental issues during the monitoring period.

Photos:



Photo 10 – Seepage from the BDRHEF tunnel continues to infiltrate to ground within the infiltration ponds (January 12, 2017).



Photo 11 – Steel Liner installation works at the BDRHEF tunnel portal (January 12, 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 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 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.

- 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 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 February 2017:

- Electrical work associated with dry commissioning at the BDRHEF Intake.
- Electrical component installation will continue at the BDRHEF powerhouse.
- Manifold installation and concrete works will continue at the BDRHEF downstream tunnel portal.
- Steel liner installation will continue, and a low density concrete fill will be injected around the steel liner once installation is complete.

6.0 **Transmission Line – Monitoring Results**

6.1 *Transmission Line Construction Activities*

Construction Activities:

Segment 9

- Demobilizing an excavator and dozer from the Salmon Main.

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 monitoring 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 January 2017:

Upper Lillooet Hydro Project - Wildlife Observation Form					
Date	Time	Observer (Company)	Species or Description	Location	Comments
01/20/2017	14:30	Stephanie Ellis (Sartori)	Moose	KM30	From Helicopter
01/21/2017	9:40	Jean M. Pelletier	Grouse	KM31	on the road
01/23/2017	13:05	Claude Leblanc	Moose	KM28	on the road, mother and calf
01/25/2017	9:35	Oliver Robson	Moose	KM11	on the road, mother and calf
01/25/2017	10:05	Trucker calling	Moose	KM19	on the road
01/25/2017	14:30	Tom Hicks	Moose	KM12	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.			

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.			
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	

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	<ol style="list-style-type: none"> 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. 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. 	December 1, 2016	Upon completion of Truckwash Creek over-drain repairs		
ULR #65	Complete	Construction Camp	Improperly stored wildlife attractants and lack of electric fence maintenance.	<ol style="list-style-type: none"> Waste management: Food waste was improperly stored in bins outside at dorms A, B and C, as well as outside of the kitchen. This food waste has attracted pine martins to the area as a number of prints were observed. Please ensure the food waste is not stored where it can be accessed by martins or other wildlife and ensure that food waste bins are always kept shut. Update January 25, 2017 – Management of the waste bins on Pad #1 and in the temporary bins on Pad#4 is improved, and no pine martins were observed. The inside of the recycling bins were burned with a torch and small amounts of ammonia and water mixture was sprayed inside the bins to discourage pine martins from entering the bins. Electric fences: While most of the electric fences were observed to be cleared of snow, the gates at the pad 1, 3 and 4 entrances and the kitchen delivery entrance were not being used. Also the electric fence around the kitchen was not cleared of snow and did not appear to be functional. Please restore the function of the electric fences as soon as possible. January 25, 2017 – CE continues to dig out the electric fence following snow storms to the best of their abilities. The conditions at the camp pose minimal risk of attracting bears as they are currently in hibernation and attractants are being well managed. This item is considered closed. 	January 3, 2017	January 6, 2017	January 25, 2017	

(next ITM – BDR#28 & ULR#66)

9.2 *Transmission Line*

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