

# Upper Lillooet Hydro Project

## Weekly Environmental Monitoring Report #97

Reporting Period: June 19 – July 2, 2016

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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		<b>Date Prepared:</b> September 28, 2016 <b>Date Submitted:</b> October 6, 2016

## 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
    - 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)
    - Occupant Licence to Cut (BDRHEF – KM 38 laydown) No. L49698
    - Occupant Licence to Cut (BDRHEF) No. L49816 (Amendments 1, 2, 3)
  - Occupant Licence to Cut (TX Line) No. L49697 (Amendments 1, 2, 3, 4, 5, 6, 7, 8, 9)
- 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
    - Works Permit for Construction within FSR Right-of-Way No. 6123-16-01
  - 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)
- Section 8 - Special Use Permit issued for the operation of an avalanche weather station on Crown land (File No. S25988)

### 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; 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*  
*Water Sustainability Act Section 10(1) Use Approval dated March 24, 2016*  
*Section 7 Explosives Act – Magazine Licence (U76018) Renewal April 30, 2016*

#### ACRONYMS:

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

## 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
June 19 – 25, 2016	SE, MC	<p><b>Construction Camp, Laydown Areas and the Lillooet River FSR</b></p> <ul style="list-style-type: none"> <li>Road maintenance on the Lillooet River FSR</li> </ul> <p><b>ULRHEF Intake &amp; Upstream Tunnel</b></p> <ul style="list-style-type: none"> <li>Umbrella support system (lattice girders, meshing, shotcrete) installation, mechanical excavation, and canopy tube grout injection</li> <li>Intake structure and control building rebar, formwork, excavation, backfill and concrete works</li> <li>Injection grouting/sealing sluiceway</li> <li>New 12" pipe line installed to upgrade capacity of the water treatment system</li> </ul> <p><b>ULRHEF Downstream Tunnel</b></p> <ul style="list-style-type: none"> <li>Drilling, blasting, shotcrete and tunnel stabilization</li> </ul> <p><b>ULRHEF Penstock</b></p> <ul style="list-style-type: none"> <li>Excavation of Truckwash creek &amp; drilling of rock anchors</li> <li>Concrete poured for penstock protection/support through Truckwash Creek crossing</li> <li>Welding and coating works</li> <li>Backfill, compaction and reclamation</li> </ul> <p><b>ULRHEF Powerhouse &amp; Tailrace (above the HWM)</b></p> <ul style="list-style-type: none"> <li>Tailrace rebar, formwork, backfill, compaction and concrete</li> <li>Andritz mechanical works and sandblasting</li> </ul> <p><b>BDRHEF Intake &amp; Upstream Tunnel Portal</b></p> <ul style="list-style-type: none"> <li>Intake rebar, formwork and concrete</li> <li>Finalizing installation of the stationary concrete boom and pump delivery system</li> <li>Tunnel portal excavation</li> </ul> <p><b>BDRHEF Downstream Tunnel</b></p> <ul style="list-style-type: none"> <li>Drilling, blasting and tunnel stabilization</li> </ul> <p><b>BDRHEF Powerhouse &amp; Tailrace (above the HWM)</b></p> <ul style="list-style-type: none"> <li>Andritz electrical work</li> <li>Tailrace work on hold</li> </ul> <p><b>TX-Line</b></p> <ul style="list-style-type: none"> <li>Segment 9 – Road repairs at rock slide near RVMA 205a along the Salmon Main &amp; setting poles via helicopter (structures 203 – 222)</li> <li>Segment 10 – Preparing poles for stringing conductor (structures 231- 242)</li> <li>Segment 11 – Machine ground prep for structures 277 – 280 (including blasting)</li> <li>Segment 12 – Dust control product application along Miller Bench FSR (KM0 - KM3)</li> <li>Segment 13 – Ground prep (including blasting) at structures 307-313</li> <li>Segment 15 – ground prep, including digging and blasting throughout segment 15 with the exception of structure 376</li> <li>Segment 16 – Framing pole structures 385-391</li> </ul>
June 26 – July 2, 2016	SE, MC, TH	<p><b>Construction Camp, Laydown Areas and the Lillooet River FSR</b></p> <ul style="list-style-type: none"> <li>Dust suppression application on the Lillooet River FSR between KM1.4 – KM37.7</li> <li>Generating rip rap for the BDRHEF tailrace at the crusher pad within the KM38 laydown</li> <li>Clearing brush and organics to expand the KM45 spoil area following AMBNS (completed by Ecofish)</li> </ul> <p><b>ULRHEF Intake &amp; Upstream Tunnel</b></p> <ul style="list-style-type: none"> <li>Shutdown due to landslide risk for the majority of the week</li> <li>Umbrella system excavation and consolidation (class 4CT)</li> </ul>

Date	IEM Team Personnel	Key Monitoring Locations & Activities
		<ul style="list-style-type: none"> <li>• Intake rebar, formwork, excavation, backfill and concrete works</li> <li>• Complete install of 12" pipe line to upgrade capacity of the water treatment system</li> <li>• Sediment removed by excavator from the first cell of the settling ponds</li> </ul> <p><b><i>ULRHEF Downstream Tunnel</i></b></p> <ul style="list-style-type: none"> <li>• Drilling, blasting, shotcrete application and tunnel stabilization</li> <li>• Removal of accumulated sediment from the water treatment system</li> <li>• Parking area cleaned of hydrocarbon leaks from machinery, lined with impermeable membrane, and covered in road base material</li> </ul> <p><b><i>ULRHEF Penstock</i></b></p> <ul style="list-style-type: none"> <li>• Rebar, formwork, and concrete pours to protect the penstock at the Truckwash Creek crossing</li> <li>• Welding and coating works</li> <li>• Backfill, compaction and reclamation</li> <li>• Construction of the Lillooet River Trail penstock crossing visual barrier berms</li> <li>• Repair and placement of organics/woody debris on the slope next to stream crossing at ASTR-03</li> </ul> <p><b><i>ULRHEF Powerhouse &amp; Tailrace (above the HWM)</i></b></p> <ul style="list-style-type: none"> <li>• Tailrace rebar, formwork, and concrete</li> <li>• Andritz mechanical works and manifold coating completed</li> <li>• Decommissioning of the active water treatment system</li> </ul> <p><b><i>BDRHEF Intake &amp; Upstream Tunnel Portal</i></b></p> <ul style="list-style-type: none"> <li>• Intake rebar, formwork and concrete</li> <li>• Stormtec water treatment system maintenance</li> <li>• Drilling and blasting for the Upstream Tunnel Portal</li> <li>• Ditch improvements from KM3.75 – KM5 of the intake access road</li> </ul> <p><b><i>BDRHEF Downstream Tunnel</i></b></p> <ul style="list-style-type: none"> <li>• Drilling, blasting and tunnel stabilization</li> </ul> <p><b><i>BDRHEF Powerhouse &amp; Tailrace (above the HWM)</i></b></p> <ul style="list-style-type: none"> <li>• CE extended the overflow return pipe directly to Boulder Creek from the water extraction system. Ecofish conducted a fish salvage in the short section of watercourse that partially dried up once the discharge was extended to reach the Creek. No fish were captured or observed.</li> <li>• Trenching for water line and septic system installation</li> <li>• Andritz electrical work</li> <li>• Parking area and mechanic laydown cleaned of hydrocarbon leaks from machinery, lined with impermeable membrane, and covered in road base material</li> </ul> <p><b><i>TX-Line</i></b></p> <ul style="list-style-type: none"> <li>• Segment 9 – Setting poles via helicopter (structures 203 – 222) &amp; Ground prep (blasting) at poles 223, 226-227</li> <li>• Segment 10 – Stringing conductor</li> <li>• Segment 11 – Machine ground prep for structures 272 – 275-276 (including blasting), straightening/backfilling poles 259 &amp; 260</li> <li>• Segment 12 – Constructing spur road to access structure 305</li> <li>• Segment 15 – backfill poles and framing structures throughout</li> <li>• Segment 16 – Framing pole structures 385-391</li> </ul>

***IEM Team Personnel:*** TH – Tom Hicks; SS – Stephen Sims; DA – Danita Abraham; SE – Stephanie Ellis; MC – Mike Champion

## 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.
June 20	<i>Email</i>	INX, SES, CE, JEM, MFLNRO, BCEAO, BCCOS, Lil'wat Nation	RE: CE-EIR-025 – CE prepared an incident report for the June 17 occurrence where three (3) cinnamon coloured black bear cubs entered the lunchroom at the ULRHEF lower tunnel work area. The bears did not access food inside to the lunchroom, no crewmembers were injured and no damage was observed. SES and INX reviewed the incident report prior to submission to agencies on June 20. Further detail is available in the attached incident report.	EIR025
June 20	<i>Email</i>	INX, CE, SES, JEM	INX distributed the Upper Lillooet River HEF Licence of Occupation Modification Agreement for the Realignment of the Tunnel, dated for reference as June 21, 2016.	-
June 21	<i>Email</i>	SES, CE, INX	RE: Mis-management of domestic waste at the ULRHEF lower portal. SES discovered improperly managed domestic waste at the lower tunnel portal. SES collected some of the domestic waste observed, and ensured it was appropriately stored at the construction camp. The IEM communicated verbally in the field, via teleconference, and via email that CE must improve domestic waste management practices immediately. CE responded immediately to correct the issue at hand by collecting the remaining mis-managed waste and was in the process of preparing a Waste and Attractant Management Protocol. The IEM will continue to perform daily inspections of all works areas to document that all waste and wildlife attractants are managed in accordance with the CEMP and project EPPs.	ULR#56
June 22	<i>Email</i>	INX, CE, SES, JEM, Hedberg	INX notified the Project Team that Recreational Sites and Trails BC officially closed the Lillooet River Trail to the public, due to the presence of numerous food-conditioned bears that have accessed food left or mis-managed by campers in the vicinity of the Pebble Creek hot-springs. INX completed a clean-up of the hot-spring area and trail collecting numerous bag of garbage left by trail users.	-
June 23	<i>Email</i>	INX, CE, SES, JEM, Hedberg	INX distributed the MFLNRO issued Works Permit for the Upper Lillooet River HEF Permanent Cable installation with the Lillooet River FSR right-of-way.	-
June 27	<i>Email</i>	CE, SES, INX	CE provided notification that their sub-contractor (Dust Away Road Spraying Ltd.) began applying a dust suppression application on the Lillooet River FSR between KM1.4 and KM37.7.	-
June 28	<i>Email</i>	INX, COSBC, MFLNRO, Ecofish, SES, JEM	INX distributed photos from wildlife cameras installed within and near the mountain goat migration corridor at Truckwash Creek. The cameras documented a number of key wildlife species including deer, moose, black bears, and mountain goats. It is important to note that the wildlife cameras captured mountain goats	-

Date	Communication Type	Participants	Issues Discussed	ITM ID No.
			using the migration corridor on the river left side of Truckwash Creek on June 19 at 6:16pm. This time would have corresponded with a shift change at the Truckwash Creek work area.	
June 28	<i>Email</i>	WEL, INX, SES	RE: WEL-EIR-026 – According to the mitigation strategy presented in EIR026, WEL confirmed that all open excavations for pole foundations are now covered or backfilled to prevent inadvertently trapping American pine martens.	EIR026
June 29	<i>Email</i>	INX, CE, WEL, SES, JEM	INX forwarded their response to the Section 34 Ministerial Order issued by BCEAO on June 17. A revised Waste Management and Wildlife Attractant Protocol prepared by CE, and an update on waste management and wildlife attractant protocols practiced by WEL, were both included with the response.	ULR#56
July 2	<i>Email</i>	JEM, MFLNRO, SES, INX	The IE distributed the May 18 and June 7 Monthly Site Visit Reports for the Upper Lillooet River and Boulder Creek Hydroelectric Facilities.	-

### 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
All Project Areas	TX Line, ULRHEF, & BDRHEF	Active Migratory Bird Nesting Period	AMBNS must occur prior to clearing vegetation in all Project areas according to the survey schedule and methods outlined in the Project's Active Migratory Bird Nest Survey Plan during the nesting period (May 1 – July 31). All nests identified as active must be protected by a no disturbance buffer until the nest is no longer deemed to be active by a QP (buffer distances vary by species and location; further details are provided in the AMBNS Plan).

Component	Location	Wildlife/Archeology Concern	Construction/Timing Restrictions & Mitigations
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	<p>Mountain Goat monitoring activities ceased and the IEM began daily spot checks on June 15, as mountain goats remained present on UL-11. On June 28, daily spot checks ceased as the IEM was informed that one of the project wildlife cameras photographed mountain goats (on June 19). The presence of mountain goats at the wildlife camera location on the left bank of Truckwash creek confirms usage of the migration corridor and suggests that mountain goats have migrated to their upper range (UL-19).</p> <p>If a mountain goat is observed within 500m line of sight of construction operations, construction must cease for at least 48 hours. The IEM must record and submit all goat observations to FLNR within 48 hours.</p>
BDRHEF intake	Portion of intake access road and intake structure within UWR u-2-002 UL 12	Mountain Goat UWR	If a mountain goat is observed within a 500m line of site of a construction activity within UWR u-2-002 UL 12, construction activities will cease for at least 48 hours. Approval from the IEM must be obtained prior to recommencing construction activities.
TX Line	Segments 8 - 16	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. The IEM must record and submit all goat observations to MFLNR within 48 hours.
		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.
		Riparian Vegetation Management Areas (RVMA)	IEM monitoring is required during clearing within RVMAs.
		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).
		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.

## 4.0 Upper Lillooet River HEF – Monitoring Results

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

#### Construction Activities:

- Routine maintenance of construction equipment within the mechanic shop and fuel management continued at the KM38 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.
- CE continued to apply water to the Lillooet River FSR and construction access roads to minimize fugitive dust production throughout the reporting period. In addition, CE applied dust suppression in the form of calcium chloride to the Lillooet River FSR between KM1.4 – KM37.7 (Photo 1).
- The crusher and screener were operating throughout the reporting period to generate riprap for the BDRHEF tailrace.

#### Environmental Summary:

- Calcium chloride was applied to the Lillooet River FSR up to 8m from a watercourse crossing according to best management practices.
- On June 22, 2016, Recreational Sites and Trails BC officially closed the Lillooet River Trail to the public, due to the presence of numerous food-conditioned bears that have accessed food left or mis-managed by campers in the vicinity of the Pebble Creek hot springs. INX completed a clean-up of the hot-spring area and trail collecting numerous bag of garbage left by trail users. Signage notifying the public of the closure is posted at a number of locations along the Lillooet River FSR (Photo 2).

#### Photos:



Photo 1 – Dust suppressant application on the Lillooet River FSR (June 28, 2016).



Photo 2 – Recreational Sites and Trails BC officially closed the Lillooet River Trail (a.k.a the Pebble Creek Hot Springs or Keyhole Falls Hot Springs trail) on June 22, 2016.

## 4.2 Intake, Concrete Arch Foundation Walls, and Upstream Tunnel

### Construction Activities:

- No activities occurred within the ULRHEF tunnel or at the intake or sluiceway structures from the evening of June 26 – July 1, 2016 due to elevated landslide risk according to the conditions of the Landslide Risk Management Plan.
- Grout injection operations and canopy tube installation at the ULRHEF upstream tunnel continued when landslide risk levels were below a High rating. Photo 3 shows the current conditions at the upstream tunnel portal.
- Formwork, rebar, and concrete works continue on the intake, sluiceway and control building structures when landslide risk levels are below a High rating (Photo 4).
- CE worked on upgrading/augmenting the piping for the dewatering system on the days that landslide risk prevented work in the tunnel (Photo 5).

### Environmental Summary:

- During grout injection, and tunnel excavation rounds in the upstream tunnel, all seepage water was directed to the ULRHEF intake sediment basins for treatment. As the intake and tunnel were not active during the second half of the reporting period, seepage water was pumped directly to the Lillooet River after water quality was confirmed to be within BCWQGs. As a result, the sediment infiltration ponds were emptied as water infiltrated to ground (Photo 6). CE's environmental management team ensured that the active treatment system was functioning and well maintained when it was in use. Water quality sampling results are available upon request.
- The IEM and CE environmental staff conducted daily site inspections to inspect sites for proper wildlife attractant management following the BCEAO Ministerial Order issued on June 17. Crews have installed signage on doors and in lunchrooms to remind crew of proper waste and wildlife attractant management at the ULRHEF headwork sites.

### Photos:



Photo 3 – Crew working on the dewatering pipes at the ULRHEF upper tunnel portal and BEBO wall work areas (June 24, 2016).



Photo 4 – Rebar and formwork for the ULRHEF sluiceway training wall (June 21, 2016).



Photo 5 – Installing new pipes to increase dewatering capacity to the ULRHEF water treatment ponds (June 28, 2016).



Photo 6 – Cell #1 of the ULRHEF intake water treatment system following 5 days of inactivity in the tunnel and at the intake due to elevated landslide risk (July 1, 2016).

### 4.3 Downstream Tunnel Portal

#### Construction Activities:

- Drilling, blasting, mucking and stabilization works (shotcrete application) within the tunnel.
- CE cleared, stripped, and grubbed the remaining OLTC area surrounding the spoil area at KM45 of the Lillooet River FSR. Ecofish completed an AMBNS and clearing authorization was granted prior to beginning the works.

#### Environmental Summary:

- On June 21, the IEM discovered improperly managed domestic waste at the lower tunnel portal work areas. SES collected some of the domestic waste observed, and ensured it was appropriately stored at the construction camp. The IEM communicated verbally in the field, via teleconference, and via email that CE must improve domestic waste management practices immediately. CE responded to correct the issue at hand by collecting the remaining mis-managed waste. The newly prepared Waste and Attractant Management Protocol has been submitted to agencies according to the Section 34 Order issued by BCEAO (ITM ULR#56). The IEM will continue to perform daily inspections of all works areas to document that all waste and wildlife attractants are managed in accordance with the new protocols, the CEMP, and project EPPs.
- Water quality discharged from the downstream tunnel portal water-treatment system was monitored daily for compliance with BCWQG. Water quality discharged to ASTR – 03 remained within BCWQG during this monitoring period. Additional water quality sampling results are available upon request.
- Maintenance and sediment removal from the active water treatment system installed near ASTR-03 (Photo 7).
- On June 9, the BCEAO inspected all mechanic shops (KM38, BDRHEF powerhouse, and KM44.7). The officer was concerned that some machinery was in poor working order and lacked spill trays or pads underneath, potentially creating contaminated soil. As a

temporary solution to this concern, CE has removed soil from the parking areas that have received drips from leaking equipment, lined the parking areas with an impermeable liner and recovered the parking areas with road base material (Photo 8). CE will maintain these parking areas by removing soil impacted by leaking equipment on a regular basis. The IEM will monitor the new parking areas, and will close ITM ULR#56 once CE successfully implements this new strategy.

Photos:



Photo 7 – Sediment removal from the lower tunnel water treatment system (July 1, 2016).



Photo 8 – CE removed small hydrocarbon spots within the parking area for the mechanics laydown and lined the area with impermeable geo-fabric topped with road base material (July 1, 2016).

#### 4.4 ***Penstock and Truckwash Creek Penstock Crossing***

Construction Activities:

- Penstock welding and coating, as well as backfill and compaction along the penstock alignment working towards the left bank of Truckwash Creek.
- Rebar, formwork, and concrete were installed to construct the penstock protection at the Truckwash Creek penstock crossing (Photo 9).
- Re-contouring, ditching, and organic material and woody debris placement was performed along the penstock alignment between the powerhouse and ASTR-03 (Photo 10 & Photo 11).
- Welding, coating, backfill, and compaction of penstock east of Truckwash Creek.

Environmental Summary:

- The IEM was onsite to monitor all concrete pours at the Truckwash Creek crossing and no water quality concerns were noted.

Photos:



**Photo 9 – Rebar and formwork installation for protection of the penstock at the Truckwash Creek crossing (June 25, 2016).**



**Photo 10 – Repairs completed on slope adjacent to ASTR-03 penstock crossing (June 27, 2016).**



**Photo 11 – Overview of penstock alignment at ASTR-04 crossing with organic material and woody debris placement (June 27, 2016).**

## **4.5 Powerhouse, Tailrace & Access Road**

Construction Activities:

- Rebar, formwork, and concrete works for the tailrace (Photo 12).
- Andritz mechanical works in the ULRHEF powerhouse (Photo 13).
- Decommissioning of the active water treatment system following the final sensitive concrete pour for the ULRHEF tailrace.

Environmental Summary:

- The IEM monitored water quality, from the outlet of the active water treatment system during all tailrace concrete pours during the reporting period. Water discharged to the Lillooet River remained within BCWQG throughout the reporting period. Additional water quality sampling results are available upon request.

Photos:



Photo 12– Concrete pour for the ULRHEF tailrace (July 2, 2016).



Photo 13 – Mechanical works in the ULRHEF powerhouse (June 21, 2016).

### 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 have been selected to quantify WQ conditions within the Lillooet River upstream and downstream of active construction areas. The IEM acknowledges the natural variability of instream WQ conditions in the Lillooet River due to seasonal 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 (µS)	Temp (°C)
<b>Routine Water Quality</b>						
June 25, 2016	10:00	ULR Background – ULRHEF Intake	7.60	25.4	-	7.9
	10:30	ULR #0.5 – Downstream of ULRHEF intake at Keyhole Bridge	7.79	24.0	-	7.4
	11:27	ULR # 1 – Upstream of ULRHEF Powerhouse	7.82	39.0	-	9.2
	11:45	ULR #2 – Downstream of ULRHEF Powerhouse between KM 40.5 and KM 41	7.83	28.9	-	9.0

Date	Time	Sample Location Description	pH	Turbidity (NTU)	Cond (µS)	Temp (°C)
	13:15	ULR #3 – Lillooet River FSR KM 38 Laydown – D/S of Boulder confluence	7.73	24.3	-	11.3
	18:45	ULR #4 – Lillooet River FSR KM 24 – D/S of all works and Meager confluence	7.93	29.4	-	11.9
June 30, 2016	-	ULR Background – ULRHEF Intake	Not accessible due to elevated landslide risk			
	-	ULR #0.5 – Downstream of ULRHEF intake at Keyhole Bridge				
	10:30	ULR # 1 – Upstream of ULRHEF Powerhouse	7.70	36.9	44	6.8
	10:50	ULR #2 – Downstream of ULRHEF Powerhouse between KM 40.5 and KM 41	7.60	39.1	35	6.5
	9:10	ULR #3 – Lillooet River FSR KM 38 Laydown – D/S of Boulder confluence	7.00	51.7*	30	6.0
	8:20	ULR #4 – Lillooet River FSR KM 24 – D/S of all works and Meager confluence	7.50	80.8*	34	6.8

### 4.7 Recommendations

IEM recommendations for the ULRHEF are as follows:

- All water from the ULRHEF upstream tunnel heading should be conveyed to the sediment basins for treatment. CE should perform regular monitoring to ensure that the water treatment system is functioning as intended and that discharge to the Lillooet River continues to meet BCWQGs.
- CE should regularly monitor the water treatment system installed to treat water emanating from the downstream tunnel to ensure the system is functioning as intended and that discharge into ASTR-03 (non-fish bearing and non-CTF) continues to meet BCWQGs. The water treatment system capacity should be regularly assessed to ensure the system can handle the necessary volumes of water and to prevent discharging process water above BCWQGs offsite. An assessment of the Lillooet River Trail has determined that the trail must be re-routed around the section impacted by erosion and/or the trail needs to be repaired along its existing alignment. Work to repair/re-route the trail is scheduled to occur in late August or early September 2016.
- CE should continue to remove deposited material within the mountain goat UWR replacement area, as the snow melts. Once CE has removed as much of the deposited material as possible, and the snow is fully melted, the area should be inspected by a QP to determine what remedial actions are needed (ITM ULR#49; FAM#11).
- CE should perform regular inspections at all parking areas and ensure all spilled fuel and/or oil is cleaned up and disposed of in the proper disposal container, as per the Human-Bear Conflict Management Plan, and Hazardous Materials Management Plan.
- CE should continue to remind crews and enforce food and wildlife attractant management practices that adhere to the Human – Bear and Human – Wildlife Interaction Management Plans.

## 4.8 *Upcoming Works*

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

- Canopy tube installation, lattice girder installation, grout injection, drilling, and blasting in class 4CT material, will continue in the ULRHEF upstream tunnel.
- Drilling, blasting and tunnel stabilization at the ULRHEF downstream tunnel.
- Construction of the penstock protection and installation of the penstock at the Truckwash Creek crossing.
- Finalizing the structure portion of the ULRHEF tailrace.
- Sandblasting of ULRHEF powerhouse turbine inlet valves.
- Use of the ULRHEF intake sediment basins will continue.

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

### 5.1 *Access Road & Intake*

#### Construction Activities:

- Formwork, rebar, and concrete works continued on the intake and sluiceway structures (Photo 14)
- CE finalized the construction of a fixed concrete pump tower; however, a portion of the fixed line ruptured on June 20 and was not used again during this reporting period (Photo 15). Spilled concrete was removed and cured before being hauled to the KM3 spoil site.
- Blasting and excavation of the upstream tunnel portal was performed, following rounds of consolidation of the tunnel and tunnel portal, to allow for the construction of the intake-tunnel transition structure (Photo 16).

#### Environmental Summary:

- Water quality of the discharge from the Boulder Creek intake water treatment system was monitored daily for compliance with BCWQG. Water quality discharged to Boulder Creek remained within BCWQG during this monitoring period. Additional water quality sampling results are available upon request.
- Mitigation measures outlined in the Blast Management Plan and CEMP were followed and the IEM was present for all surface blasts within 30m of Boulder Creek.
- CE performed some ditch improvements between KM3.75 – KM5 of the intake access road, following the June 8, BCEAO officer recommendation. Additionally, the access road should be graded and/or capped to minimize erosion during rain events.

Photos:



**Photo 14 – Formwork, rebar, and concrete works at BDRHEF Intake structure (June 21, 2016).**



**Photo 15 – Concrete delivery pipe supplying the stationary concrete boom arm failed along BDRHEF intake access road (June 20, 2016).**



**Photo 16 – Drilling pattern for BDRHEF upstream tunnel portal excavation (June 28, 2016).**

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

### Construction Activities:

- Drilling, blasting, and tunnel stabilization in the downstream tunnel portal.
- Fish and amphibian salvage was completed prior to moving the overflow pipe, which emanates from the water extraction system that supplies clean water to the drilling operation in the tunnel (Photo 17).
- CE removed hydrocarbon-contaminated soil and lined the parking area near the mechanic laydown along the BDRHEF powerhouse access road (Photo 18).
- Electrical component installation in the BDRHEF powerhouse.
- Trenching and installation of water and septic utility lines.

- Riprap was placed along the edges of the BDRHEF powerhouse tailrace (Photo 19).

Environmental Summary:

- Ecofish was onsite to conduct a fish and amphibian salvage of a short section of channel created by the overflow bypass pipe, which emanates from the water extraction system that supplies clean water to the drilling operation in the tunnel (Photo 17). The salvage was deemed necessary because of the surface water connection between the channel and Boulder Creek. No fish or amphibians were captured during the salvage operation.
- On June 9, the BCEAO inspected all mechanic shops (KM38, BDRHEF powerhouse, and KM44.7). The officer was concerned that some machinery was in poor working order and lacked spill trays or pads underneath, potentially creating contaminated soil. As a temporary solution to this concern, CE has removed soil from the parking areas that have received drips from leaking equipment, lined the parking areas with an impermeable liner and recovered the parking areas with road base material (Photo 18). CE will maintain these parking areas by removing soil impacted by leaking equipment on a regular basis. The IEM will monitor the new parking areas, and will close ITM ULR#56 once CE successfully implements this new strategy.
- All wastewater related to the BDRHEF tunnelling works was contained and pumped to the downstream portal settling ponds for treatment (Photo 20).

Photos:



Photo 17 – Fish and amphibian salvage conducted during removal of process water overflow pipe (June 27, 2016).



Photo 18 – CE removed hydrocarbon-contaminated soil and lined the parking area near the mechanic laydown along the BDRHEF powerhouse access road (June 29, 2016).



Photo 19– Placing riprap protection along the edges of the tailrace (July 2, 2016).



Photo 20 – Conditions of the BDRHEF settling ponds (June 22, 2016).

### 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 Boulder Creek 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 exceedances are marked by an asterisk (\*).

Date	Time	Sample Location Description	pH	Turbidity (NTU)	Cond (uS)	Temp (°C)
<b>Routine Water Quality</b>						
June 25, 2016	12:10	BDR BG – Upstream of BDRHEF intake	7.70	13.7	-	7.6
	12:13	BDR #1 – Downstream of BDRHEF intake	7.71	11.4	-	7.6
	12:35	BDR #2 – Upstream of BDRHEF Powerhouse	7.75	18.8	-	9.8
	12:45	BDR #3 – Downstream of BDRHEF Powerhouse at Pebble Creek Bridge	7.72	13.6	-	9.1
June 30, 2016	15:44	BDR BG – Upstream of BDRHEF intake	7.30	32.0	31	10.0
	15:55	BDR #1 – Downstream of BDRHEF intake	7.30	35.5	25	10.0
	9:50	BDR #2 – Upstream of BDRHEF Powerhouse	6.80	28.0	29	6.2
	9:40	BDR #3 – Downstream of BDRHEF Powerhouse at Pebble Creek Bridge	6.90	29.4	30	6.2

## 5.4 *Recommendations*

IEM recommendations for the BDRHEF are as follows:

- All construction related wastewater should continue to be directed to the water treatment systems. CE to continue regular inspections of the water treatment systems to ensure that the systems are in good condition, and all maintenance activities are performed as outlined in the work plan.
- CE should regularly monitor the BDRHEF intake active water treatment system to ensure the system is functioning as intended and that discharge into Boulder Creek is within BCWQGs. The water treatment system capacity should be regularly assessed to ensure the system can handle the necessary volumes of water.
- CE should ensure that all surface blasts continue to follow the Blast Management Plan by adding blast mats and any other mitigations necessary to protect Boulder Creek and the intake structure from fly-rock.
- CE should ensure that their domestic and construction waste are properly disposed of in the appropriate containers to avoid animal attractants, and to continue to abide by the Human-Wildlife Interaction Plan.
- CE should perform regular inspections at all parking areas and ensure spilled fuel and/or oil is cleaned up and disposed of in the proper disposal container, as per the Human-Bear Conflict Management Plan, and Hazardous Materials Management Plan.

## 5.5 *Upcoming Works*

The following new and/or environmentally sensitive construction activities are scheduled to occur at the BDRHEF during the next reporting period:

- BDRHEF downstream tunnelling works will continue.
- Electrical component installation will continue at the BDRHEF powerhouse.
- Rebar, formwork, and concrete works will continue for the Intake structures.
- Excavation, blasting, and consolidation will continue for the upstream tunnel portal and tunnel entrance.

## 6.0 **Transmission Line – Monitoring Results**

### 6.1 *Transmission Line Construction Activities*

#### Construction Activities:

##### **Segment 9**

- Ground prep for structure 223; 226-227 & setting poles via helicopter at structures 203-222.
- Road repairs at rockslide near RVMA 205a along the Salmon main.

**Segment 10**

- Preparing poles and stringing conductor at structures 231- 242 & straightening/backfilling poles 259 & 260

**Segment 11**

- Machine ground prep for structures 272, 275-280 including blasting.

**Segment 12**

- Dust control product application along Miller Bench FSR (KM0 - KM3)
- Mumleqs constructing spur road to access structure 305.

**Segment 13**

- Machine ground prep including structure 307-313.

**Segment 15**

- Ground prep and pole setting, including digging and blasting throughout Segment 15 with the exception of structure 376.

**Segment 16**

- Framing pole structures 385-391.

Environmental Summary:

- The IEM inspected the Segment 12 dust control application to verify that the product was not applied within 8m of a watercourse crossing (Photo 21). No concerns were noted.

Photos:



**Photo 21 – Dust suppression product application along the Miller Bench FSR. Notice the gap left at the watercourse crossing (June 24, 2016).**

## 6.2 Recommendations

IEM recommendations for the Transmission Line are as follows:

- WEL’s Environmental Manager continues to provide regular scheduling updates to permit the IEM to assess environmental risks and coordinate monitoring requirements. Any changes to the weekly schedule and/or updates should continue to be provided with a minimum of 48 hours’ notice if the need for IEM presence is required or expected to be required.

## 6.3 Upcoming Works

The following new and/or environmentally sensitive construction activities are scheduled to occur for construction of the Transmission Line:

- Road repairs and pole installation via helicopter in Segment 9.
- Application of calcium chloride for dust control in Segment 12.

## 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 June 2016:

Upper Lillooet Hydro Project - Wildlife Observation Form					
Date	Time	Observer (Company)	Species or Description	Location	Comments
6/1/2016	6:00	Robin Ouellet	Wolverine	FSR 40.5	
6/1/2016	18:45	Oliver James (CRT-EBC)	Black Bear	43.7 KM	
6/2/2016	6:30	Eric Ayotte	Cougar	KM 9	ran across road
6/2/2016	10:00	Robin Ouellet	Black Bear	Boulder Intake	
6/2/2016	14:45	Samuel Talbot	Black Bear	KM 2.5 boulder	Ran from road
6/3/2016	9:30	Rock truck driver	Black Bear	pebble creek bridge	crossing the bridge

Upper Lillooet Hydro Project - Wildlife Observation Form					
Date	Time	Observer (Company)	Species or Description	Location	Comments
6/3/2016	10:45	Anne Sutherland	Wolverine	Plinth Mountain	harassing a nanny with newborn
6/8/2016	20:45	Catherine Waters	Black Bear	Boulder Intake 4 km	
6/8/2016	22:50	Thunder Grandbois	Black Bear	FSR 42 KM	
6/10/2016	16:04	Marc Imbeault	Black Bear	42.3 KM FSR	
6/12/2016	17:20	Sebastien Hamelin	Black Bear	42.3 KM FSR	
6/12/2016	21:10	Catherine Waters	Black Bear	42.25 KM FSR	
6/12/2016	13:40	Jean Pelletier	Black Bear	42.5	
6/13/2016	8:30	Eric Langlois	Black Bear	near the penstock at 41.7 km	
6/14/2016	10:42	David Hughes	Black Bear	FSR km 46	cub
6/14/2016	8:00	Stephanie Ellis	Black Bear	FSR KM 31.5	Cinnamon sub adult
6/14/2016	6:35	Thunder Grandbois	Moose	FSR KM 43.5	
6/14/2016	20:00	Gabriel Ross	Black Bear	FSR KM 42.2	
6/14/2016	18:50	Timothy Dan	Black Bear	FSR KM 43.4	
6/15/2016	8:00	Stephanie Ellis	Black Bear	FSR KM 10	Cinnamon bear on bridge
6/15/2016	9:50	Ruby Joe	Coyote	FSR 37.5 (gate)	Standing on the edge of the treeline
6/15/2016	10:30	Simon Munneke	Black Bear	FSR KM38.2	
6/15/2016	14:00	Danita Abraham	Black Bear	FSR 46.2	Mom with 4 cubs
6/16/2016	9:15	Lianne Leblond	Black Bear	33.5	On road
6/16/2016	9:55	Ian McKeachie	Mule Deer	1.25 KM Camp Road	
6/16/2016	8:30	Daniel Paquet	Black Bear	Boulder Intake 0.75KM	
6/16/2016	17:00	Joseph McIntyre	Black Bear	Camp Road 0.25	
6/16/2016	16:05	Cindy McPherson	Black Bear	KM 48.3	Just off Roadway
6/17/2016	11:00	Lisa Andrews	Black Bear	KM 44.7 lunch room	3 cubs Inside/around trailer
6/17/2016	21:15	Brittany Linnet	Black Bear	KM 42	Hotsprings parking lot
6/18/2016	11:00	Stephanie Ellis	Black Bear	FSR KM 41.2	2 sub adults
6/18/2016	19:30	Stephanie Ellis	Black Bear	FSR KM 10	Cinnamon juvenile
6/19/2016	8:18	Stephanie Ellis	Moose	FSR KM 22	Ran along road
6/19/2016	11:30	Gabriel Ross	Black Bear	39.7	Ran across road
6/20/2016	21:00	Stephanie Ellis	Cougar	FSR KM 35	Ran into bushes
6/21/2016	15:30	Brittany Linnet	Moose	42.5	On road
6/22/2016	6:30	Corey Newsome	Wolf	FSR KM 18	Wolf cubs on road
6/23/2016	14:45	Darwin (Pacific Coast Fire Protection)	Black Bear	FSR KM 46	Mom with 4 cubs
6/23/2016	19:00	Cameron Jones (Andritz)	Black Bear	Outside electric fence camp Pad 1	
6/25/2016	11:30	Gaetan Turgeon	Black Bear	FSR KM 45	Mom with 4 cubs
6/25/2016	14:30	Samuel Talbot	Black Bear	BDR Access Rd KM 2.5	
6/25/2016	17:10	Ruby Joe	Black Bear	Camp Road	Mom with 1 cub
6/25/2016	18:35	Gabriel Ross	Black Bear	FSR KM 42.5	

Upper Lillooet Hydro Project - Wildlife Observation Form					
Date	Time	Observer (Company)	Species or Description	Location	Comments
6/25/2016	13:45	Danny Dugas	Black Bear	KM 38.5	
6/22/2016	14:30	Shea Irving	Black Bear	Structure 229	1 adult
6/28/2016	17:30	Nichole Boulton	Wolf cub	FSR KM 18.5	a black cub, 25-30lbs standing on road
6/29/2016	2:20	Theo	Cougar	FSR KM 47.5	-
6/30/2016	9:00	David Gagnon	Coyote	FSR KM 37.5	Crossing the road

## 8.0 Mountain Goat Monitoring Program

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

- The IEM or designate performed spot checks from June 16 – June 28 to monitor Mountain Goat activity within 500m of construction activities at the ULRHEF intake and the ULRHEF downstream tunnel portal, since mountain goat were still observed at UL-11 on June 15. Mountain goats spot checks were performed at two 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,
- The Monitoring effort was minimized to 15 minutes per location during daylight hours. The order of site visits rotated daily. Construction activities must cease if a goat(s) is/are observed within a 500m line of site of a construction activity.
- On June 28, daily spot checks ceased as the IEM was informed that one of the project wildlife cameras photographed mountain goats on June 19. The presence of mountain goats at the wildlife camera location on the left bank of Truckwash Creek suggests that the mountain goats have migrated from their winter range at Keyhole Falls (UL-11), through the Truckwash Creek mountain goat migration corridor, to their upper range on Mt. Athelstan (UL-19).

## 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#51	OPEN	Woodbox Culvert at KM41.2 if the Lillooet River FSR	The watercourse over topped the woodbox culvert requiring emergency works to install an additional culvert next to the woodbox to handle the additional flow. The woodbox culvert may have been compromised by the additional flows and the temporary culvert installed as an emergency measure may need to be extended.	<ol style="list-style-type: none"> <li>Assess the woodbox culvert and develop a plan to replace it with QP designed crossing structure during the instream work window or according to the recommendations of a QP if it has been compromised.  Update June 8, 2016 – CE is working on a revised design for drainage currently being diverted to the crossing structure at KM41.2. A drainage plan and/or crossing structure repair or replacement remains outstanding. The IEM understands that the repairs must be completed prior to the delivery of the ULRHEF generators. This item will continue to be tracked until repairs are completed and the drainage design finalized; however the current conditions do not present an imminent risk to the environment. The ditch lines remain sufficiently armoured against erosion and the IEM has been informed that the crossing structure is currently stable.</li> </ol>	April 8, 2016	April 22, 2016	-
ULR#54	Open	ULRHEF intake concrete sump pumping capacity & pumping shutdown	The IEM issued FAM#12 as untreated water that did not meet BCWQGs was discharged directly to the Lillooet River to prevent overtopping of the concrete sump.	<ol style="list-style-type: none"> <li>Upgrade the pumping capacity in the concrete sump to ensure all water from the BEBO wall excavation, intake and upstream tunnel can be directed to the treatment ponds simultaneously when water quality conditions require. Update May 20 – CE has ordered pumps and will upgrade the pumping capacity once the material arrive. Update June 14, 2015 – Pumping capacity upgrades have yet to be finalized.</li> <li>Stage work activities at the intake, sluiceway, tunnel and BEBO wall to ensure that all water not meeting BCWQGs can be pumped to the treatment ponds through the concrete sump. This may require that some work activities remain on hold until the pumping capacity of the system is increased. Update May 20 – CE confirmed that works will be staged to prevent exceeding the existing pumping capacity.</li> </ol>	May 17, 2016	May 24, 2016	May 20, 2016

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#56	OPEN	All ULRHEF and BDRHEF work areas.	BCEAO Inspection & Section 34 Order	1. <i>Improper waste management</i>	June 9, 2016	June 30, 2016	
				a. <i>Prepare EIR024 to document American marten attraction to waste in the KM48 construction waste.</i>			June 12, 2016
				b. <i>Prepare a Waste Management Protocol/Strategy to clean-up all mis-managed waste onsite and improve onsite waste management procedures.</i>			
				2. <i>Improve equipment maintenance and storage practices to prevent soil contamination from small leaks (use spill trays/tarps/absorbent pads, etc.) and perform regular clean-up of any leaks or spills that reach the ground.</i>			
				3. <i>Improve ditches and road run-off management along the BDRHEF intake access road.</i>			July 2, 2016
<i>No outstanding environmental issues (next ITM – BDR#28 &amp; ULR#57)</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>							



## Environmental Incident Reporting Form

<b>General Information</b>	
<b>Project Name:</b> Upper Lillooet Hydro Project	<b>Project Component:</b> Upper Lillooet Downstream Portal – Lunchroom (near 44.7 km on the FSR)
<b>Time/Date of Incident Start:</b> 2016-06-17, around 11:00 AM	<b>Time/Date Incident Stopped:</b> 2016-06-17 around 11:15 AM
<b>Date of Report:</b> 2016-06-17	<b>Project Incident Report Number:</b> 2016-06-17 CE-EIR-025
<b>Report Prepared By:</b> Jean M. Pelletier/ Lianne Leblond	
<b>Contractors Environmental Manager:</b> Jean M. Pelletier/Lianne Leblond	
<b>Independent Environmental Monitor:</b> Tom Hicks, Stephanie Ellis	
<b>Licensee’s Environmental Coordinator:</b> Julia Mancinelli	

<b>Contact Information for Company Involved in Incident</b>	
<b>Company:</b> CRT-ebc, s. e. n. c.	<b>Address:</b> PO Box 585, Pemberton BC – V0N 2L0
<b>Phone #:</b> 604-894-5002	<b>Email:</b> jdrapeau@crtconstruction.ca
<b>Contact Person:</b> Jonathan Drapeau	<b>Position:</b> Project Manager

<b>Incident Type (check all that apply)</b>			
<b>Encroachment of an Environmentally Sensitive Area (e.g. Riparian/Wildlife Buffer)</b> Please provide details in “Description” section below.	<input type="checkbox"/>	<b>Adverse Impacts to Fish/Wildlife (e.g. Mortality/Injury)</b> Please provide details in “Description” section below.	<input type="checkbox"/>
<b>Water Quality/Quantity</b> Please provide details in “Description” section below.	<input type="checkbox"/>	<b>Hazardous Material Spills (to ground or water)</b> Please provide details in description section in regards to: <ul style="list-style-type: none"> <li>Perceives extent of damage</li> <li>Type, quantity and area of the spill</li> <li>Containment Procedures</li> <li>Environmental features in close proximity to the spill</li> </ul>	<input type="checkbox"/>
<b>Disturbance of known or unknown archeological /heritage site</b> Please provide details in “Description” section below.	<input type="checkbox"/>	<b>Air Quality</b> Please provide details in “Description” section below.	<input type="checkbox"/>
<b>Spill reported to external agencies</b> If yes, describe the receiving environment and substance/quantity spilled.	<input type="checkbox"/>	<b>Other</b> Please provide details in “Description” section below.	<input checked="" type="checkbox"/>

### Incident Profile

<b>Weather at time of incident</b>	 <input type="checkbox"/> Clear	 <input checked="" type="checkbox"/> Partly Cloudy/ Variable	 <input type="checkbox"/> Cloudy	 <input type="checkbox"/> Showers/ Periods of Rain	 <input type="checkbox"/> Rain	 <input type="checkbox"/> Heavy Rain (>25mm in 24hr)	 <input type="checkbox"/> Storm (Heavy rain and high winds)	 <input type="checkbox"/> Snow
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**Specific Location:** Upper Lillooet Downstream Portal – Lunchroom (near 44.7 on the FSR)

#### Description and Cause of Incident:

**Description:** At around 11:00 AM, a maintenance worker entered the trailer lunch room near the Upper Lillooet Downstream portal. As she entered, 2 cubs escaped from the lunch room while another entered. She retreated to her pick-up truck and called CRT-EBC Environment Team and the IEM. Both Stephanie Ellis (SES Monitor on site), and Matt Fallaise (Env. Manager for CRT-EBC) responded to the call. They arrived on site about 15 minutes later. At that time the lunch room was empty. Upon inspecting the lunch room they found no bear attractants and no food waste inside. Walking the perimeter around the lunch room, they found fresh bear scat in the forested area nearby.

**Cause:** The exact cause of this incident is unknown, since no bear attractants were found on site. The mother bear and her cubs have been reported by CRT-EBC staff to CRT-EBC’s environmental managers many times over the past few months. She and the cubs have not shown human food habituation. She and her cubs have also been sighted by tourists visiting the Keyhole Hotsprings. See below for recent sightings:

April:

4/19/2016	12:30	Luc Morin	Black Bear & 4 cubs	Truckwash Creek, near laydown
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May:

5/7/2016	14:30	Marie-Claude	Black Bear & 4 cubs	UL downstream portal
5/9/2016	07:00	Kevin Barns	Black Bear & 4 cubs	Penstock near 42.5 km
5/17/2016	11:30	Stephanie Ellis	Black Bear & 4 cubs	KM 47 FSR
5/17/2016	18:00	Real Dupont	Black Bear & 4 cubs	KM 49 FSR (Keyhole Bridge)
5/18/2016	17:30	Miners	Black Bear & 4 cubs	KM 49 FSR (Keyhole Bridge)
5/21/2016	08:50	David Bourgouin	Black Bear & 4 cubs	FSR 46 KM
5/24/2016	10:00	Francois Pelletier	Black Bear & 4 cubs	FSR 45.5 KM

June:

6/12/2016	17:20	Sebastien Hamelin	Black Bear & 4 cubs	42.3 KM FSR
6/12/2016	21:10	Catherine Waters	Black Bear & 4 cubs	42.25 KM FSR
6/14/2016	20:00	Gabriel Ross	Black Bear & 4 cubs	FSR KM 42.2
6/14/2016	18:50	Timothy Dan	Black Bear & 4 cubs	FSR KM 43.4
6/15/2016	14:00	Danita Abraham	Black Bear & 4 cubs	FSR 46.2
6/17/2016	11:00	Lisa Andrew	3 black bear cubs	KM 44.7 DSP lunch room



<b>Incident Witness:</b> Lisa Andrew			
<b>Were there any Potential Environmental impacts as a result of the incident?</b> (e.g., surface contamination, storm sewers, or fish/wildlife mortalities)	<b>Yes</b> <input type="checkbox"/>	<b>None Observed</b> <input checked="" type="checkbox"/>	
<b>If Yes, please describe:</b>			
<b>Has Wildlife Salvage Protocol been followed?</b>	<b>Yes</b> <input type="checkbox"/>	<b>No</b> <input type="checkbox"/>	<b>N/A</b> <input checked="" type="checkbox"/>
<b>If No, please explain:</b>			
<b>Water Quality Samples Collected?</b>	<b>Yes</b> <input type="checkbox"/>	<b>No</b> <input type="checkbox"/>	<b>N/A</b> <input checked="" type="checkbox"/>
<b>If yes, attach results of water quality analysis to report in table format. Include Laboratory analysis if completed. If No please explain:</b>			
<b>Have applicable photos and/or drawings been attached to the incident report?</b>	<b>Yes</b> <input checked="" type="checkbox"/>	<b>No</b> <input type="checkbox"/>	<b>N/A</b> <input type="checkbox"/>
<b>Incident Response Measures</b>			
<ol style="list-style-type: none"> <li>Upon arrival the cubs were gone, the mother was nowhere to be seen. There was no damage inside the lunch room. There was no bear attractant inside, and there was no waste inside.</li> <li>Signage related to proper food management and bear presence in the area was posted as well as in the parking lot for campers at km 42 and at the trail entrance and information board (See photos attached).</li> <li>The door to the lunchroom will remain closed at all times. Signage has been posted on all doors of the lunchrooms (see photos attached).</li> </ol>			
<b>Actions to Prevent Incident Recurrence</b>			
<ol style="list-style-type: none"> <li>We are already in the process of improving waste management on site. Workers will be reminded to close the door of the lunch rooms at all times.</li> <li>Inspection of the lunch rooms by the Environmental Team to ensure compliance with Waste management, human bear conflict management plan and wildlife management plan.</li> <li>Bin inspection by the nightshift manager to make sure compliance is observed.</li> </ol>			

<b>Notification Record</b>						
<b>Agency Reported to</b>	<b>Contact Information</b>	<b>Agency Contacted</b>		<b>Date Reported</b>	<b>Reported By</b>	<b>Method of Reporting</b>
		<b>Yes</b>	<b>No</b>			
<b>External</b>						
MFLNRO	James Davies	<input checked="" type="checkbox"/>	<input type="checkbox"/>	June 17, 2016		Email
BCEAO	Chris Parks & Justin Carlson	<input checked="" type="checkbox"/>	<input type="checkbox"/>	June 17, 2016	Oliver Robson	email
Lil'wat Nation	Harriet VanWart	<input checked="" type="checkbox"/>	<input type="checkbox"/>	June 17, 2016		email



Notification Record						
Agency Reported to	Contact Information	Agency Contacted		Date Reported	Reported By	Method of Reporting
		Yes	No			
PEP	1-800-663-3456	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
DFO	Herb Klassen	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
Environment Canada	604-666-6100	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
Canadian Coast Guard	604-666-6011	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
Local Fire Rescue	911	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
RAPP reporting line and Sea-to-sky Conservation Officer	1-877-952-7277 Tim Schumacher 604 905-2797	<input checked="" type="checkbox"/>	<input type="checkbox"/>	June 17, 2016	Tom Hicks	Phone Call
Internal						
Innergex	Oliver Robson	<input checked="" type="checkbox"/>	<input type="checkbox"/>	June 17 <sup>th</sup> 2016	J.M.Pelletier	Email
IEM	Tom Hicks	<input checked="" type="checkbox"/>	<input type="checkbox"/>	June 17 <sup>th</sup> 2016	J.M.Pelletier	Email
IE	Jenn McCash	<input checked="" type="checkbox"/>	<input type="checkbox"/>	June 17, 2016	Tom Hicks	Email

**Independent Environmental Monitor:**

Tom Hicks	IEM – Sartori Environmental Services		June 17 <sup>th</sup> 2016
Print Name	Position and Company	Signature	Date

**Contractor's Manager:**

Lianne Leblond	Project Manager – CRT-ebc		June 17 <sup>th</sup> 2016
Print Name	Position and Company	Signature	Date



1- Additional signage at the lunch room



2 - Additional signage at the trailhead message board



3 - Additional signage at the Keyhole trail access



4 - Additional signage at KM 42 parking area