



Upper Lillooet Hydro Project

Final Environmental Monitoring Report #115

Reporting Period: June 1 – November 30, 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)

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Owner Construction Permits and Approvals

Environmental Assessment Certificate No. E13-01 (Amendment 1, 2, 3, 4, 5, 6, 7)
 Fisheries Act Subsection 35(2)(b) Authorization No. 09-HPAC-PA2-000303 (Amendment 1, 2)
 Letter of Advice for the Transmission Line No. 09-HPAC0-PA2-000303
 Leave To Commence Construction (ULRHEF) File No. 2002561
 Leave To Commence Construction (BDRHEF) File No. 2002453
 Leave To Commence Construction (TX Line) File No. 2002561/2002453
 Leave to Commence Diversion (ULRHEF) File No. 2002561
 Leave to Commence Diversion (BDRHEF) File No. 2002453
 Conditional Water Licence (ULRHEF C130613) File No. 2002561
 Conditional Water Licence (BDRHEF C129969) File No. 2002453
 Conditional Water Licence (BDRHEF C131153) File No. 2003601
 Licence of Occupation & Modification Agreement (ULRHEF #232384) File No. 2409871
 Licence of Occupation (BDRHEF #232386) File No. 2409998
 Licence of Occupation (TX Line #2423386) File No. 2410654
 Occupant Licence to Cut (ULRHEF) No. L49717(Amendments 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11)
 Occupant Licence to Cut (BDRHEF – KM38 laydown) No. L49698
 Occupant Licence to Cut (BDRHEF) No. L49816 (Amendments 1, 2, 3, 4, 5)
 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 1, 2) April 30, 2016
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	SEI	Sartori Environmental Inc.
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:

Inspection Date(s)	IEM Team Personnel	Key Monitoring Locations & Activities
June 7 & 22, 2017	TH	<p><i>ULRHEF & BDRHEF Reclamation of Intakes, Powerhouses, Lower Tunnel Portals, Construction Camp, Laydown Areas, & Spoil Areas</i></p> <p>June 2 – Lillooet River FSR KM41.2</p> <ul style="list-style-type: none"> • CE completed maintenance of the KM41.2 culvert. Ecofish performed environmental monitoring duties in coordination with the IEM, due to a scheduling error. A summary of the monitoring results (including a description of work, water quality sampling results and photos) was submitted to the IEM following completion of the works. See Section 4.1 for additional details. <p>June 7 – Inspection of reclamation works</p> <ul style="list-style-type: none"> • The IEM inspected all permanent and temporary work areas to review progress of reclamation activities. Reclamation activities were being performed as prescribed in the Upper Lillooet Hydro Project Master Reclamation Work Plan – Revision 4. <p>June 22 – BDRHEF Powerhouse</p> <ul style="list-style-type: none"> • CE completed construction of the BDRHEF powerhouse access road drainage and performed a wet connection to the BDRHEF tunnel seepage ditch under IEM supervision. All water continues to infiltrate to ground within the rock armoured drainage ditch. <p><i>TX Line Road Deactivation and Reclamation</i></p> <p>June 7 – Segments 1 – 5</p> <ul style="list-style-type: none"> • The IEM inspected road deactivation works. WEL began seasonal and permanent road deactivation according to prescriptions outlined in the Works Plan for Transmission Line Access Roads Deactivation and Rehabilitation – North Zone.
July 7 & 14, 2017	TH	<p><i>ULRHEF & BDRHEF Reclamation of Intakes, Powerhouses, Lower Tunnel Portals, Construction Camp, Laydown Areas, & Spoil Areas</i></p> <p>July 14 – Final Inspection of ULRHEF & BDRHEF Reclamation</p> <ul style="list-style-type: none"> • The IE, IEM, INX, & CE inspected all permanent and temporary work areas to review the final status of reclamation activities. One final staging area, within the TX Line right-of-way, at KM39.5 of the Lillooet River FSR remained to be reclaimed at the time of the inspection. All other planting and reclamations activities were completed according to the Upper Lillooet Hydro Project Master Reclamation Work Plan – Revision 4. <p><i>TX Line Road Deactivation and Reclamation</i></p> <p>July 7 – Spur road deactivation Segment 8</p> <ul style="list-style-type: none"> • The IEM monitored the removal of three temporary culverts and the permanent deactivation of two spur roads (184.1 and 185.1). Water quality monitoring was performed throughout the works, which were performed according to best management practices. No environmental concerns were noted. • WEL continues to complete seasonal and permanent road deactivation prescriptions according to the Works Plan for Transmission Line Access Roads – Deactivation and Rehabilitation – North Zone. Access road deactivation works from Segment 1 – 5 were completed by July 3, 2017; however planting was postponed to the fall due to drought conditions.

August 2017	No IEM Monitoring Required	
September 6 & 26, 2017	TH	<p>ULRHEF & BDRHEF Reclamation of Intakes, Powerhouses, Lower Tunnel Portals, Construction Camp, Laydown Areas, & Spoil Areas</p> <p>September 26 – EAO & Lil’wat Nation Site Inspection</p> <ul style="list-style-type: none"> Representatives from EAO Compliance and Enforcement, INX, SEI, WEL, and the Lil’wat Nation performed a site inspection of all permanent and temporary work areas to review the completed reclamation works. TX Line access road deactivation and reclamation works in Segment 1 – 5 were also inspected. No concerns were raised during the site inspections. All TX Line reclamation activities (including planting and seeding in both the North and South Zones) were completed by September 19, 2017. <p>TX Line Road Deactivation and Reclamation</p> <p>September 6 – Helicopter landing pad installations</p> <ul style="list-style-type: none"> The IEM performed a helicopter overflight of seven locations where permanent helipads are required to be installed to facilitate access for TX Line operations / maintenance. The helipad location closest to structure 376 in Segment 15 was assessed to determine whether works could proceed in advance of the fall season. Further details are provide in Section 5.1.
October 2017	TH, KF	<p>Site inspections conducted in October focused on the monitoring of repairs to the Obermeyer weir, concrete armouring, cutting and removal of a portion of the sluiceway training wall, and the installation of a de-sanding siphon/pipe within the intake structure. Daily reports were prepared and submitted by SEI to MFLRNO to summarize the environmental monitoring and water quality sampling data collected during environmentally sensitive portions of these activities. Further information pertaining to these works has been omitted from this IEM report as the works were considered to be part of the commissioning phase of the project. The report is the last and final IEM report for the ULHP. All other items are being addressed through commissioning / operation & maintenance reporting directly to MFLNRO.</p>
November 2017	No IEM Monitoring Required	

IEM Team Personnel: TH – Tom Hicks; KF – Katie Fisher

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 2	<i>Email, phone calls, kick-off meeting</i>	SEI, CE, INX, Ecofish	CE informed the IEM that the culvert maintenance works at KM41.2 of the Lillooet River FSR scheduled for June 7 were ready to proceed that day, and requested permission to proceed. As Ecofish was onsite and able to perform CTF salvage, the IEM, CE, Ecofish and INX, agreed that works could proceed with Ecofish conducting water quality sampling and monitoring of the works. The work plan was reviewed during a pre-works meeting with CE, Ecofish and the IEM over the phone and works proceeded under Ecofish supervision. A summary of the works is provided in Section 4.1.	-

Date	Communication Type	Participants	Issues Discussed	ITM ID No.
June 5	<i>Email</i>	SEI, CE, INX	SEI circulated an updated ITM matrix providing notification that ULR#64 was considered closed as the material at Truckwash Creek the appears to be stable from an ESC perspective. Some minor planting remains to be completed in the area; however as the material does not currently pose an ESC risk the item has been closed.	ULR#64
June 12	<i>Email</i>	INX, SEI, JEM, Ecofish, Knight-Piesold	INX circulated the MFLNRO issued Addendum No.3 for the BDRHEF leave to commence diversion (LTCD).	-
June 20	<i>Email</i>	CE, INX, SEI	CE supplied an email confirming the quantity and location of blast rock generated during tunneling activities by the use of ANFO.	-
July 10	<i>Email</i>	WEL, SEI, INX	WEL informed the project team that access road decommissioning works were suspended due to the hot, dry weather and fire risk. Notification will be provided once works are scheduled to resume.	-
July 14	<i>Email</i>	CE, SEI, INX	CE provided the IEM with documentation prepared by their QP, confirming that the reclamation activities at the BDRHEF temporary mechanic shop and laydown were complete. The submission of this report closes the last outstanding project related environmental issue (ULR#58).	ULR#58
July 15	<i>Email</i>	CE, SEI, INX	CE provided confirmation that the wastewater treatment system and septic field used for the ULHP construction camp had been decommissioned according to the BC Ministry of Heath Sewerage System Standard Practice Manual.	-
July 17	<i>Email</i>	SEI, INX, CE, JEM	The IEM provided a summary of the July 14 inspection of the final condition of the BDRHEF and ULRHEF following completion of reclamation activities. The IEM requested documentation to confirm completion of site reclamation works, including: confirmation of water well decommissioning; cancellation of the registration under the Municipal Wastewater Regulation (file number 107032); and a QP prepared report documenting completion of reclamation activities according to the ULHP Master Reclamation Plan – Revision 4.	-
July 28	<i>Email</i>	CE, INX, SEI, JEM	CE provided the documentation requested by the IEM in their July 17 email (see above). The KM39.5 laydown will be reclaimed by WEL and is the last remaining area to be reclaimed on the BDRHEF and ULRHEF.	-
August 7	<i>Email</i>	WEL, INX, SEI	WEL provided an update confirming works had resumed on the deactivation and reclamation of access roads in the South Zone. Deactivation works in the Ryan River drainage were completed; however WEL was waiting for suitable weather to complete the necessary planting in the area. WEL confirmed that they will continue to update the IEM of activities and provide 48 hour notice of activities requiring IEM monitoring.	-
August 28 & September 2	<i>Email</i>	WEL, INX, SEI	WEL submitted a memo confirming that soil sampling within the KM39.5 laydown area was completed and that the laboratory results confirmed that soil contamination levels were well below the soil quality thresholds outlined by the British Columbia Contaminated Sites Regulation for Wildland Standards. WEL recommended that reclamation works be completed as soon as possible. On September 2, WEL provided photos confirming that the reclamation	-

Date	Communication Type	Participants	Issues Discussed	ITM ID No.
			works had been completed with the exception of seeding with non-legume seed mix.	
August 29	<i>Email</i>	WEL, INX, SEI	WEL confirmed that all planting in the Ryan River was completed within the approved Ryan River Drainage TX Line construction period (June 1 – September 1).	-
September 6	<i>Email</i>	SEI, INX, Hedberg	The IEM distributed an email summary of a helicopter overflight assessment conducted on September 6. The assessment was conducted at 7 permanent helicopter landing pad locations. The helipad location closest to structure 376 in Segment 15 was assessed to determine mitigation measure to be implemented during the works to prevent displacing grizzly bears from GB59 fall forage habitat. As the helipad was not located within the GB59 polygon, the main mitigation measure to protect the habitat was to minimize flights to and from the area to the extent possible, and follow the pre-determined flights path agreed upon during the flight. No grizzly bears were observed within GB59 or in the surrounding area during the flight assessment. As outlined in the work plan, all grizzly bear sightings were to be reported to the IEM immediately and work to cease in the area until further direction was provided by the IEM. Based on the proposed mitigation measures and the works required to install the helipads the IEM determined that monitoring would not be required.	-
September 18	<i>Email</i>	Herberg, SEI, INX	Hedberg confirmed that all works at the helicopter landing pad near structure 376 and the grizzly bear habitat polygon GB59 were completed on September 15. No grizzly bears were observed during any of the helicopter flights to or from the work site.	-
September 20	<i>Email</i>	INX, SEI, JEM	INX informed the IEM and IE that the Operators residence location was moved from the old construction camp location, to a location near the BDRHEF powerhouse just above the Boulder Creek fan and adjacent to the BDRHEF tunnel spoil area. The IEM reviewed the work plan and confirmed that environmental risk in the area was low and would not require IEM monitoring. One crossing of the existing perimeter ditch was required to construct access to the Operators residence location. As water within the perimeter ditch infiltrates to ground and does not discharge offsite, work to install a culvert presents minimal risk to downstream surface water quality. As these works present low environmental risk and are not bound by timing restrictions, the IEM will not be reporting on the completion of construction of the Operators residence. Monitoring of these work activities will occur on an opportunistic basis thorough October and November. Work will begin on the Operators residence upon issuance of the occupational licence to cut (OLTC) for the area.	-
October 12	<i>Email</i>	INX, SEI	INX forwarded the MFLNRO issued OLTC L49816 amendment 5 authorizing the removal of trees to construct the Operators residence	-
October 17	<i>Email</i>	INX, MFLNRO, EAO, DFO, SEI, Hedberg,	INX submitted two QP prepared reports confirming that ULHP Transmission Line temporary access roads and temporary work spaces had been deactivated and reclaimed/revegetated according to conditions of the approved work plan.	-

Date	Communication Type	Participants	Issues Discussed	ITM ID No.
October 27	Email	INX, MFLNRO, JEM, SEI	INX circulate the IEM prepared memorandum, confirming that reclamation of all temporary disturbed works areas associated with the Upper Lillooet Hydro Project is completed; the Alena Creek fish habitat enhancement was successfully completed; and all temporary mitigation measures have been removed, and no outstanding environmental issues pertaining to construction remain onsite.	-

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	Mountain Goat UWRs & Migration Corridor	If a mountain goat is observed within 500m line of sight of construction operations, construction must cease for at least 48 hours. Approval from the IEM must be obtained prior to recommencing construction activities, and the IEM must record and submit all goat observations to MFLNRO within 48 hours.
TX Line	All Segments	Mountain Goat UWRs SO-04 & SO-08	If a mountain goat is observed within 500m line of sight of construction operations, construction must cease for at least 48 hours. Approval from the IEM must be obtained prior to recommencing construction activities, and the IEM must record and submit all goat observations to MFLNRO within 48 hours.
		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. Clearing and construction should avoid the fall season to avoid displaying bears at GB26; GB33; GB53; & GB59.
		Riparian Vegetation Management Areas (RVMA)	IEM monitoring is required during clearing within RVMAs.
		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.
		Ryan River Drainage	Construction of the transmission line into and across the Ryan River drainage must occur from June 1 – September 1.

4.0 Upper Lillooet River HEF & Boulder Creek HEF – Monitoring Results

4.1 *Intakes, Powerhouses, Lower Tunnel Portals, Construction Camp, Laydown Areas, & Spoil Areas*

Construction Activities:

- On June 2, CE completed maintenance of the KM41.2 culvert under the supervision of Ecofish. Ecofish conducted a CTF salvage of the works area, prior to the start of works. No CTF were observed or captured during the salvage operation. To repair the culvert inlets, water was diverted to river left culvert first, which allow excavation and rock armouring of the river right and center culverts to proceed in isolation of the majority of the flow (Photo 1). Once this work was completed, CE diverted flow to these newly repaired culverts which allow the remaining rock armouring and culvert repair on river left to be completed in the absence of the majority of the flow. Ecofish monitored water quality throughout the works. Temporary pulses of turbid water were generated during the flow diversions, resulting in temporary exceedance of BCWQGs for a period of less than two hours (maximum turbidity = 804AU), and works were complete in under three hours (Photo 2). Detailed water quality results are available upon request.
- On June 22, CE completed construction of the BDRHEF powerhouse access road drainage and performed a wet connection to the BDRHEF tunnel seepage ditch under IEM supervision (Photo 3). All water continues to infiltrate to ground within the rock armoured drainage ditch and to water quality concerns were noted.
- Construction of the Operators residence began following issuance of the OLTC (L49818 amendment 5) obtained to allow clearing of the site footprint. Following a pre-work meeting and based on a review of the site conditions and lack of environmental sensitivities, the IEM determined that full time monitoring of construction of the Operators residence would not be required as works presented low environmental risk. Opportunistic monitoring of the area occurred and no environmental concerns were noted (Photo 13).

Reclamation Activities:

- CE demobilized construction equipment and materials throughout the reporting period. Reclamation of temporary works areas involved contouring, soil de-compaction, spreading of stockpiled organic soils, placement of woody debris, seeding, and planting. Prior to implementing reclamation activities CE removed construction waste and performed soil sampling (in laydown areas, parking areas, and hazardous material storage areas) to confirm that soil quality met BC CSR Wildland Standards.

Environmental Summary:

- On July 14, the IE, IEM, INX, and CE conducted a final inspection of all ULRHEF and BDRHEF construction areas to inspect reclamation activities to confirm that no outstanding issues remained (Photo 4 - 11). One small laydown area, within the TX Line right-of-way, remained to be reclaimed at the time of the inspection (KM39.5 of the Lillooet

River FSR). It was determined that WEL would be completing reclamation of this area at a later date. Following the inspection the IEM requested supporting documentation to confirm that all reclamation activities had been completed according to the ULHP Master Reclamation Plan – Revision 4. The IEM received supporting documentation confirming that reclamation of the BDRHEF and ULRHEF was completed on July 28. Confirmation of the completion of final reclamation of the KM39.5 laydown was provided to the IEM on September 2 (Photo 12– Final reclamation of the KM39.5 laydown (September 2, 2017)).

- On September 26, EAO Compliance and Enforcement performed a site tour to inspect site conditions following completion of reclamation activities. The site tour was also attended by the IEM, INX, WEL, and members of the Lil'wat Nation. No concerns with the current site conditions was presented by the EAO Compliance and Enforcement officer following the site inspection.

Photos



Photo 1 – Excavation and armouring of the KM41.2 culvert inlets with the majority of flow diverted (June 2, 2017).



Photo 2 – Completed excavation and rock armouring of the KM41.2 culvert inlets (June 2, 2017).



Photo 3 – Drainage tie-in at the completed BDRHEF powerhouse drainage ditch. All water infiltrated to ground and no surface water discharged offsite (June 22, 2017).



Photo 4 – Overview of the final condition of the ULRHEF intake river right area (July 14, 2017).



Photo 5 – Overview of the final condition of the ULRHEF intake river left area, slopes have been planted (July 14, 2017).



Photo 6 – Final condition of the ULRHEF downstream tunnel portal and Truckwash Creek Mountain goat migration corridor and riparian area (July 14, 2017).



Photo 7 – Final condition of penstock leading to ULRHEF powerhouse. Alder seed has been spread (July 14, 2017).



Photo 8 – Final condition of the ULRHEF powerhouse riparian area. The area has been planted (September 22, 2017).



Photo 9 – Final condition of the two main BDRHEF intake spoil areas. Alder seed has been spread (July 14, 2017).



Photo 10 – Final condition of the KM38 laydown area (July 14, 2017)



Photo 11 – Final condition of the ULHP construction camp area following reclamation (July 14, 2017).



Photo 12 – Final reclamation of the KM39.5 laydown (September 2, 2017)



Photo 13 – Completed residence (November 16, 2017).

4.2 ***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 or Boulder Creek. Water quality monitoring was performed during all construction and commissioning activities that had the potential to affect downstream water quality including; repairs to the KM41.2 culverts. Water quality sampling results are discussed in Section 4.1 and detailed results are available upon request.

4.3 ***Recommendations***

IEM recommendations for the ULRHEF are as follows:

- No recommendations are provided. As the project moves through the commissioning phase and into the operations phase, INX will monitor survivorship of planted reclamations areas to fulfill long-term monitoring commitments.

5.0 **Transmission Line – Monitoring Results**

5.1 ***Transmission Line Construction Activities***

Construction Activities:

- WEL environmental manager provided the IEM with regular scheduling updates on the access road deactivation and reclamation activities, in order to allow the IEM to determine the need for IEM monitoring during the works. As deactivation activities and reclamation works were occurring on existing access roads, the majority of these works presented low environmental risk. The IEM performed inspections of access road deactivation and reclamation works on June 7, June 22, July 7, July 14, and September 26. Road deactivation and reclamation works began in early June and were completed by mid-September. The IEM has requested to receive documentation prepared by a QP to confirm that all TX Line access road deactivation, reclamation and revegetation activities were completed as per the Upper Lillooet Hydro Project Transmission Line Access Road Deactivation Plans for the North and South zones. These reports were provided to the IEM on October 17, 2017. The IEM prepared an issued a memo on October 27, 2017 confirming that all TX Line access road deactivation, reclamation and revegetation activities were completed.

Environmental Summary:

- On July 7, the IEM monitored the removal of three temporary culverts (non-fish bearing & non-CTF bearing streams) and the permanent deactivation of two spur roads (184.1 and 185.1). Water quality monitoring was performed throughout the works, which were performed according to best management practices. Minimal flow was present during the removal of the culvert on access road 185.1 and the second culvert on access road 184.1, and works were completed without affecting downstream water quality, as water infiltrated into ground following removal of the culverts (Photo 17 & 18). The removal of the 600mm CSP on access road 184.1 required pumps to divert flow around the work area during the

culvert removal (Photo 19 & 20). A temporary pulse of turbid water was generated during removal of the culvert and rock armouring of the channel. The temporary pulse occurred as some water bypassed the pumps and flowed through the work area once the culvert was removed. The temporary pulse of turbid water resulted a temporary exceedance of BCWQGs (duration = <25 minutes; max turbidity = 1076 AU). No lasting environmental impacts are expected to have resulted as a result of the temporary increase in turbidity.

- On September 6, the IEM participated in a helicopter overflight assessment to inspect conditions at 7 permanent helicopter landing pad locations. The helipad location closest to structure 376 in Segment 15 was assessed to determine whether an adaptive management approach could be developed to permit the construction of the helicopter pad, while minimizing the potential to displace grizzly bears from utilizing the GB59 fall forage habitat. As the helipad was not located within the GB59 polygon, no clearing was required, and conditions typical of fall were not yet apparent (Photo 21), the IEM determined works could proceed provided helicopter flights to and from the area were minimized to the extent possible, and that all flights followed a pre-determined flight path agreed upon during the overflight assessment. No grizzly bears were observed within GB59 or in the surrounding area during the overflight assessment. As outlined in the work plan, all grizzly bear sightings were to be reported to the IEM immediately and work was to cease in the area until further direction was provided by the IEM. Based on the proposed mitigation measures and the works required to install the helipads the IEM determined that monitoring would not be required. Installation of the helipad near structure 376 was completed by September 15, and no grizzly bear sightings were reported during the works.
- Maintenance of the avalanche path at KM26 of the Lillooet River FSR was completed in October 2017. These works involved the removal of residual avalanche debris that remained underneath the TX Line following the January 20, 2017 avalanche. These works were not considered part of the construction phase of the Project; however, INX requested that SEI oversee the works and review the work plan prior to the start of works. No environmental concerns were noted during the monitoring of the works.
- The installation of 7 helicopter landing pads were completed by the end of November 2017. These activities posed low environmental risk and were completed according to the IEM and IE approved work plan and within project approved timing windows (Photo 22).

Photos



Photo 14 – Typical access road reclamation works in the North Zone (KM23 of the Lillooet River FSR; June 7, 2017).



Photo 15 – Access road seasonal deactivation and reclamation (Segment 5 near the Lillooet River crossing; June 22, 2017).



Photo 16 – Access road reclamation (spur at KM29 of the Lillooet River FSR; June 22, 2017).



Photo 17 – Reclamation of the 185.1 access road in Segment 8 following culvert removal. Minimal flow infiltrated to ground following culvert removal (July 7, 2017).



Photo 18 – Reclamation of the 184.1 access road in Segment 8 following removal of the smaller of the two culverts. Minimal flow infiltrated to ground following culvert removal (July 7, 2017).



Photo 19 – Removal of the 600mm CSP culvert on the 184.1 access road in Segment 8 with bypass pumps in place (July 7, 2017).



Photo 20 – Conditions ~30 minutes following the removal of the second culvert on the 184.1 access road in Segment 8 with bypass pumps removed and water flowing clear (July 7, 2017).



Photo 21 – Conditions within GB59 as seen from the helipad location during the overflight assessment. Note: Fall conditions have not yet arrived (September 6, 2017)



Photo 22 – Helipad H376 final condition (September 15, 2017).

5.2 **Water Quality Results**

The IEM performed water quality monitoring during all access road deactivation and reclamation works that had the potential to affect downstream water quality including; removal of culverts along the 184.1 and 185.1 access roads in Segment 8. Water quality sampling results are discussed in Section 5.1 and detailed results are available upon request.

5.3 **Recommendations**

IEM recommendations for the Transmission Line are as follows:

- No recommendations are provided. As the project moves through the commissioning phase and into the operations phase, INX will monitor survivorship of planted reclamations areas to fulfill long-term monitoring commitments.

6.0 **Wildlife Sightings**

Project Personnel are required to regularly update the wildlife sighting record and it is mandatory for all personnel to report wildlife sightings. 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

No wildlife sightings were reporting to the IEM by the Owner or their Contractors, during this reporting period.

7.0 **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 not involve loud construction activities.
- To mitigate potential impacts to mountain goats, 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.

8.0 Environmental Issues Tracking Matrix (ITM)

8.1 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 July 14 – CE provide a memo from their QP (Cascade Environmental) confirming that the temporarily stockpiled the material in the mechanics yard has been removed and buried at the appropriate depth in the Boulder Spoil pile, and that the remaining soils under the stockpiled material are free of contamination.			July 14, 2017

ULR #64	OPEN	Penstock access road and riparian area on the left bank of Truckwash Creek	Organics, mineral soils, and snow were mixed during construction of an access path on the left bank of Truckwash Creek	<p>1. Soils (organics and mineral soil) were mixed with snow and placed on an access path constructed to perform Truckwash Creek over-drain repairs. This material is placed on the permanent penstock access road and in the riparian area of Truckwash creek, which will need to be reclaimed in 2017. The mixed material (organics, soils, and snow) are to be removed upon completion of the penstock over-drain repair works, to eliminate the ESC risk.</p> <p>Update June 5, 2017 – This material appears stable from an ESC perspective. Some minor planting remains to be completed in the area; however as the material does not currently pose an ESC risk the item has been closed.</p>	December 1, 2016	Upon completion of Truckwash Creek over-drain repairs	June 5, 2017
<i>No outstanding environmental issues (next ITM – BDR#28 & ULR#66)</i>							

8.2 Transmission Line

ITM Tracking Legend:		<i>Work Item Open</i>					
Issue Tracking		<i>Work Item Complete</i>					
Environmental Issue		<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>							