

Upper Lillooet Hydro Project



Weekly Environmental Monitoring Report #4

Reporting Period: October 6th – October 12th, 2013

Lillooet River Forest Service Road (FSR) realignment and Transmission Line Clearing (Seg. 1 & 2)

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)

*Environmental Assessment Certificate No.E13-01 (Amendment 1)
Occupant Licence to Cut (FSR realignment) No. L49717
Occupant Licence to Cut (TX Line S.1, S.2, S.5 Heli Pads) No. L49697
Section 57 Authorization (hiking trail construction) File No. 16660-20
Road Use Permit No. 6123-13-02*

Distribution List		Prepared By
Name	Organization	
Trevor Andrews	Fisheries and Oceans Canada	 J. Alex Sartori, R. P. Bio. Independent Environmental Monitor &  J. Stephen Sims, R. P. Bio. Delegated Environmental Monitor
James Davies	MFLNRO – Water Allocation	
Nathan Braun	BC Environmental Assessment Office	
George Steeves	True North Energy – Independent Engineer	
Jennifer McCash	True North Energy – Independent Engineer	
Krys Muniak	Innergex Renewable Energy Inc.	
Oliver Robson	Innergex Renewable Energy Inc.	
Julia Mancinelli	Innergex Renewable Energy Inc.	
Liz Scroggins	Innergex Renewable Energy Inc.	
Gaétan Turgeon	CRT-EBC Construction Inc.	
Éric Ayotte	CRT-EBC Construction Inc.	
Tim Wales	CRT-EBC Construction Inc.	
Jean Pelletier	CRT-EBC Construction Inc.	
D’Arcy Soutar	Westpark Electric Ltd.	
Pontus Lindgren	Westpark Electric Ltd.	
Harriet VanWart	Lil’wat Nation	
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ACRONYMS:

BCWQG	British Columbia Water Quality Guidelines
BDRHEF	Boulder Creek Hydroelectric Facility
CRT-EBC	CRT-EBC Construction Inc.
Ecofish	Ecofish Research Ltd.
ESC	Erosion and Sediment Control
FSR	Forest Service Road
Hedberg	Hedberg and Associates Ltd.
IEM	Independent Environmental Monitor
Innergex	Innergex Renewable Energy Inc.
ITM	Issue Tracking Matrix
LTC	Leave to Construct
MFLNRO	Ministry of Forestry, Lands and Natural Resources
MOE	Ministry of Environment
RVMA	Riparian Vegetation Management Area
SES	Sartori Environmental Services
TX Line	Transmission Line
ULRHEF	Upper Lillooet River Hydroelectric Facility
WQ	Water Quality
WEL	Westpark Electric Ltd.
WEMR	Weekly Environmental Monitoring Report
WTP	Wildlife Tree Patch

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:

Day	Date	IEM Team Personnel	Weather Conditions	Monitoring Locations & Key Environmental Information
Sunday	Oct 6	TH	Sun and cloud	<p>Lillooet River FSR Realignment at Truckwash Creek</p> <ul style="list-style-type: none"> FSR realignment works. <p>TX Line – Segment 2</p> <ul style="list-style-type: none"> Feller buncher crossed open channel stream in compliance with DFO operational statements (pole 33 - 36).
Monday	Oct 7	TH	Rain	<p>Lillooet River FSR Realignment at Truckwash Creek</p> <ul style="list-style-type: none"> FSR realignment works. Hand falling trees within 500m of Grizzly Bear Class 1 habitat. <p>TX Line – Segment 1 & 2</p> <ul style="list-style-type: none"> Log skidding and sorting within Class 1 & 2 Grizzly Bear forage habitat (poles 1 – 2). No trails were constructed. Feller buncher crossed open channel streams in compliance with DFO operational statements (pole 36 - 37.5). <p>Truckwash Creek Trail</p> <ul style="list-style-type: none"> Trail construction began.
Tuesday	Oct 8	TH,EB	Sun and cloud	<p>Lillooet River FSR Realignment at Truckwash Creek</p> <ul style="list-style-type: none"> Precautionary Coastal Tailed Frog salvage and culvert installation. <p>TX Line – Segment 1</p> <ul style="list-style-type: none"> Log loader and skidder working (poles 4-5, 8-9, 10-13). <p>Truckwash Creek Trail</p> <ul style="list-style-type: none"> Trail construction monitoring.
Wednesday	Oct 9	AS,TH,EB	Sun and cloud	<p>Lillooet River FSR Realignment at Truckwash Creek</p> <ul style="list-style-type: none"> Coastal Tailed Frog salvage and culvert installation. <p>TX Line – Segment 2</p> <ul style="list-style-type: none"> Log loader and skidder working (poles 14 – 18). Hand falling in Stream 9 RVMA. <p>Truckwash Creek Trail</p> <ul style="list-style-type: none"> Trail construction continued.
Thursday	Oct 10	EB	Sun and cloud	<p>Lillooet River FSR Realignment at Truckwash Creek</p> <ul style="list-style-type: none"> Coastal Tailed Frog salvage and culvert installation in Coastal Tailed Frog stream. <p>TX Line – Segment 2</p> <ul style="list-style-type: none"> Log loader and skidder (poles 19 -25). Hand falling within 100m (i.e. 100m to 30m buffer zone) of Coastal Tailed Frog habitat without notifying the IEM. (ITM#TL1). <p>Truckwash Creek Trail</p> <ul style="list-style-type: none"> Trail construction continued.

Friday	Oct 11	TH	Sun and cloud	Lillooet River FSR Realignment at Truckwash Creek <ul style="list-style-type: none"> Completed tie-in of culvert extension in Coastal Tailed Frog stream. TX Line – Segment 2 <ul style="list-style-type: none"> Log loader and skidder (poles 25-28) Truckwash Creek Trail Trail construction continued.
Saturday	Oct 12	-	-	-

IEM Team Personnel: AS – Alex Sartori; EB – Enrico Barbon; TH – Tom Hicks

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.
Oct. 7	Truckwash Creek Trail construction pre-work meeting	CRT-EBC, Hedberg, Innergex, SES	<ul style="list-style-type: none"> Reviewed work plan and protocols for constructing foot paths and plank bridges around watercourses (Photo 3) 	N/A
Oct 9	TX Line RVMA clearing prescription pre-work meeting	WEL, Mumleqs, Hedberg, Innergex, SES	<ul style="list-style-type: none"> Reviewed updated clearing prescription for RVMA's for Segment 1 and 2 of the Transmission Line and discussed/reviewed the approach to temporary watercourse crossings and discussed how watercourse crossings will be conducted upon approval of the LTC. 	N/A
Oct 10	Email notification	WEL, SES	<ul style="list-style-type: none"> The IEM was notified via email that hand clearing within 100m of Boulder Creek (Coastal Tailed Frog habitat) was completed without IEM notification or presence onsite 	TL-1

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 Concern	Construction/Timing Restrictions & Mitigations
ULRHzeF	Lillooet River FSR realignment at Truckwash Creek	<i>Grizzly Bear Class 1 suitable fall forage habitat (ULL-GB05)</i>	<i>IEM was onsite during clearing to oversee clearing activities within 500m of suitable Grizzly Bear fall forage habitat and ensure clearing boundaries were minimized.</i>

TX Line	Segment 1 Pole locations 1 – 3	<i>Grizzly Bear Class 1 suitable fall forage habitat (ULL-GB06 &ULH-GB01)</i>	<i>IEM was onsite to oversee clearing activities and ensure clearing boundaries were minimized.</i>
	Segment 1 Stream 9 RVMA	<i>Working within 15m of Stream 9 (fish-bearing)</i>	<i>IEM was onsite for clearing activities (hand falling) within the Stream 9 RVMA buffer. Vegetable based bar oil was used in the chainsaws and no trees were felled into the stream.</i>
	Segment 2 Pole locations 18 - 20	<i>Coastal Tailed Frog stream (Boulder Creek)</i>	<i>IEM was not onsite and was not notified of clearing activities within the 100m stream buffer prior to hand falling. See ITM#TL1. Falling was completed within the 100m – 30m boundary and no removal of course woody debris was completed with any type of logging machinery.</i>

4.0 Upper Lillooet River Hydroelectric Facility

4.1 Monitoring Results

4.1.1 Lillooet River FSR Realignment at Truckwash Creek

Construction Activities

- Continued clearing, bulk excavation and road base construction on west side of Truckwash Creek from FSR realignment Stn 2+200m – 1+950m.
- Start of construction at the east heading, including bulk excavation; and the installation/replacement of two 600mm CSP culverts (Stn. 1+160, Coastal Tailed Frog stream; Stn. 1+170, small tributary stream)
- Hand falling trees within 500m of Grizzly Bear Class 1 habitat (suitable fall forage; ULL-GB05) occurred on October 7th, 2013. Clearing limits were minimized.

Environmental Summary:

- IEM was onsite periodically throughout this reporting period to oversee general construction activities and full-time during clearing in Grizzly Bear Class 1 suitable fall forage habitat (ULL-GB05).
- Culvert replacements occurred at Stn. 1+160 and Stn. 1+170 during this reporting period. Precautionary Coastal Tailed Frog (CTF) isolation and salvage occurred at Stn. 1+170, prior to culvert installation (Oct. 9). No

CTFs were observed or captured. A CTF isolation and salvage of the Stn. 1+160 culvert replacement work area occurred on Oct. 9 prior to culvert replacement works, which occurred on Oct. 10 & 11 (Photo 1). In total 26 tadpoles were captured and relocated to suitable habitat upstream of the work area. A survey of the riparian area was completed to ensure no adult CTF were located within the works area. Culvert replacement works were performed under full time supervision of the IEM and employed standard dewatering BMPs (Photo 2). A pulse of elevated turbidity was observed during commissioning of the of Stn. 1 +160 culvert resulting in a temporary exceedance of BCWQG, which lasted less than 30 minutes (see WQ results presented below).

- No further environmental issues were observed.

Photos:



Photo 1. Finalizing the culvert replacement at Stn. 1+160 (Oct 11, 2013).



Photo 2. Coastal Tailed Frog tadpoles captured and relocated to suitable upstream habitat within the Stn. 1+160 watercourse (Oct 9, 2013).

Water Quality Results

Date	Time	Sample Location Description	pH	Turbidity (NTU)	Temperature (°C)
Oct. 8	11:00	Small tributary at Stn. 1+170 – upstream of works	6.78	1.03	7.0
	10:50	Small tributary at Stn. 1+170 – downstream of works	6.61	2.08	7.0
	15:15	Small tributary at Stn. 1+170 – downstream of works during re-watering	6.95	7.82	10.6
Oct. 9	8:05	Coastal Tailed Frog stream at Stn. 1+160 – upstream of works	-	0.27	-

Date	Time	Sample Location Description	pH	Turbidity (NTU)	Temperature (°C)
	9:05	Coastal Tailed Frog stream at Stn. 1+160 – downstream of works	-	0.61	-
	14:43	Coastal Tailed Frog stream at Stn. 1+160 – upstream of works during re-watering	-	0.55	-
	15:00	Coastal Tailed Frog stream at Stn. 1+160 – downstream of works during re-watering (peak pulse)	-	15.17	-
	15:12	Coastal Tailed Frog stream at Stn. 1+160 – downstream of works during re-watering	-	4.35	-
Oct. 10	10:25	Coastal Tailed Frog stream at Stn. 1+160 – upstream of works	7.76	0.34	7.3
	10:30	Coastal Tailed Frog stream at Stn. 1+160 – downstream of works	7.75	2.58	6.7
	11:15	Coastal Tailed Frog stream at Stn. 1+160 – downstream of works during culvert extension placement	7.81	2.70	7.1
	11:40	Coastal Tailed Frog stream at Stn. 1+160 – downstream of works upon completion	7.79	3.42	7.2

4.1.2 Truckwash Creek Trail Construction

Construction Activities

- Crews began the construction of a rough trail along the new Truckwash Creek Trail alignment on Oct. 7, 2013. Hand tools were used to grub and clear a footpath along a surveyed/flagged centerline.

Environmental Summary:

- No environmental issues were observed.

Photos:



Photo 3. Truckwash Creek Trail pre-construction meeting (Oct 7, 2013).



Photo 4. Looking towards the waterfall above first watercourse crossing along the trail alignment. (Oct 8, 2013).

Water Quality Results

Date	Time	Sample Location Description	pH	Turbidity (NTU)	Temperature (°C)
No WQ measurements were recorded during this reporting period. Trail construction activities had no visual effect on WQ.					

4.2 Recommendations

The following recommendations are provided for this reporting period:

Install a visual barrier along the perimeter of the stream located at the intersection of the east Truckwash Creek work heading and the current FSR alignment. A visual barrier will help to protect the watercourse from potential impacts resulting from equipment working within close proximity.

4.3 Upcoming Works

The realignment of the Lillooet River FSR and Truckwash Creek Bridge Crossing work is scheduled to continue for the next 4 - 5 weeks. Work will continue on both the east and west headings of the alignment during the next reporting period. The installation of the 1600mm culvert at the east heading and blasting at the west heading is expected to occur next week.

Truckwash Creek Trail construction will continue next week. Crews will likely complete the clearing and grubbing of a rough trail next week. The IEM was notified that once construction of a rough trail is complete, crews will begin constructing elevated footpaths through wet sections of the trail, and will also work to improve some steep and/or rocky sections.

5.0 Transmission Line

5.1 Monitoring Results

5.1.1 Segment 1 and 2 Clearing (poles 0 – 40)

Clearing Activities

- Log loader and skidder were active within Class 1 Grizzly Bear forage habitat (poles 1 - 4.5).
- Feller buncher clearing progressed to pole 37.5 this week. Temporary crossings were completed according to DFO operational statement to access previously decommissioned roads. All streams were crossed by placing logs on the stream banks and walking the tracked machine over the logs while ensuring no impact to the channel substrates or banks. The environmental monitor was present for all stream crossings and for placement of logs on the stream banks. No WQ or stability concerns were observed. (Photo 5).
- Feller buncher completed clearing activities in Segment 1 and began clearing in Segment 2 during this reporting period. Clearing with the Feller Buncher has now progressed to pole 33.
- Hand falling within the Stream 9 RVMA was monitored on Oct. 9. No environmental concerns were noted (Photo 6).

Environmental Summary:

- IEM was onsite during clearing activities to oversee clearing activities and ensure clearing boundaries within Grizzly Bear suitable Class 1 fall forage habitat (ULL-GB06 & ULH-GB01) were minimized. No environmental concerns were noted.
- Hand falling within 100m (outside the 30m buffer) of Boulder Creek, a CTF stream, occurred on Oct. 10 without IEM notification or presence (*ITM#TL1*). The environmental impact resulting from this scheduling error was low as buncher falling had previously occurred in this area and the environmental monitor conducted a walk-through of the clearing area the previous week; No significant CTF habitat existed in the area at the time of clearing. There is a low probability of a re-occurrence as the IEM has discussed this mistake with the TX Line construction team and an improved scheduling program has been implemented.
- No ESC or WQ issues were observed throughout the active works areas.

Photos:



Photo 5. One example of a temporary crossing installed by the feller buncher to cross an open channel without impacting the stream banks or substrate (Oct. 7, 2013).



Photo 6. Conditions within stream 9 RVMA following hand clearing. No trees were felled into the watercourse. (Oct. 9, 2013).

Water Quality Results

Date	Time	Sample Location Description	pH	Turbidity (NTU)	Temperature (°C)
No WQ measurements were recorded during this reporting period. No clearing with RVMAs was completed during this reporting period. Clearing activities had no visual effect on WQ.					

5.2 Recommendations

The IEM recommends improving scheduling and a means to improve the communication of the schedule to the IEM. Improvements to communications have been made by providing daily scheduling updates via email, however the IEM recommends preparing and providing a weekly “look-ahead” schedule to prevent re-occurrence of the issue identified as *ITM#TL1*.

5.3 Upcoming Works

Transmission line clearing work will continue in Segments 1 & 2 next week. No temporary or permanent access road construction or transmission line infrastructure construction will occur as part of the currently scheduled clearing activities. Clearing within RVMAs will continue next week, pre-work reviews of clearing prescriptions will continue to be completed for each RVMA prior to clearing.

6.0 Wildlife Sightings Report, Period

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) and will be submitted to the IEM on a weekly basis. Wildlife Observation forms will be summarized on a monthly basis and appended to the first WEMR of the following month. 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

7.0 Environmental Issues Tracking Matrix (ITM)

7.1 Hydroelectric Facilities (ULRHEF & BRDHEF)

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 Completion Date	Date Completed
<i>No outstanding environmental issues.</i>							

7.2 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 Completion Date	Date Completed
TL1	Closed	Within 100m of left bank of Boulder Creek	Hand fallers cleared trees within the 100m Coastal Tailed Frog buffer (outside the 30m buffer) without notifying the IEM or having the IEM onsite on October 10, 2013	This issue created low environmental impact. The feller buncher had previously worked in the area and the IEM was present and walked the site prior to the initial clearing activities. The issue arose as a result of a scheduling error and mis-communication between WEL and Mumleqs. The IEM has asked for a weekly work schedule that identifies where work activities require IEM presence.	WEL notified the IEM of the mistake on October 10, 2013	N/A	October 11, 2013