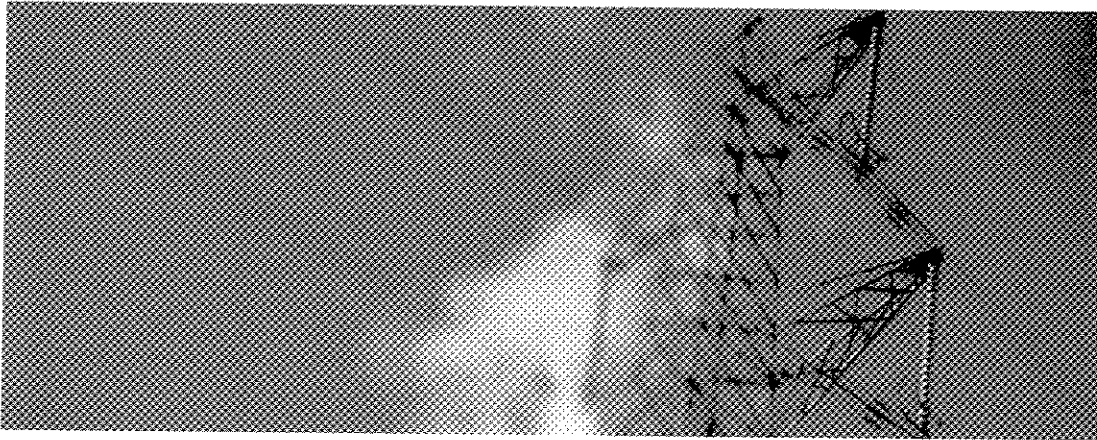


Independent Power Producer (IPP) Inspection Project Report

Stave Lake and Lamont Hydroelectric Projects



Project: Stave and Lamont hydroelectric projects

Proponent: Cloudworks Energy Inc.

Date of inspection: October 8, 2008

Staff: Josh Malt (MOE-ESD),
Jim Davies (MOE-WSD),
Paul McFadden (MOE-COS), and
Leonard Feldes (MOFR)

Contractors: Peter Kiewit and Sons,
Mike Hedberg (Forestry Consultant)

Environmental

Monitor (EM): Mac Lowry (PGL)

Sites visited: Stave camp, Stave intake, Stave access
road, Lamont intake, Lamont penstock ROW,
Lamont access road

Results

1.0 Streams and Wetlands (General)

1.1 Lamont: A 10-20 m buffer was retained around a small wetland found within the Lamont penstock ROW, with a connection to the forest on the upland side. MOE commends the adaptive approach taken in modifying the ROW alignment, as this wetland was not found in the original Environmental Assessment. (Malt)

2.0 Instream Works

2.1 Stave: As part of the clearing for the head pond at the Stave intake, trees were felled into the water course, contrary to BMPs and the CEMP. However, this appeared to be the best available option, as felling the trees to upland areas would have required additional roads and associated impacts. This activity was authorized by DFO. (Malt)

3.0 Erosion Control

3.1 Stave: Sediment control structures were not installed down-slope of large pile of crushed rock adjacent to stream (~20 m), contrary to BMPs and the CEMP. Justification given for this was the lack of organic material contained in the pile, and the placement of large rocks at the base for stabilization. (Figure 1; Malt)

3.2 Lamont: There was over-reliance on silt fencing for erosion control along the Lamont access road. Single row silt fencing should not be the only technique used for erosion control. MOE recommends the use of other techniques to provide additional lines of erosion control (such as depth). The access road and the erosion control works require a shut-down plan for stabilizing the works for winter and spring runoff conditions. (Figure 2; Davies)

3.3 Lamont: Wood and spoil from Lamont ROW clearing was decked on downstream side of road. Mac Lowry has already brought this to the attention of the contractors to be changed, and avoided in the future (Figure 3; Malt).

4.0 Bird Habitat

4.1 Stave & Lamont: Construction occurred during breeding bird season (April 1-July 31) contrary to BMPs and the CEMP. According to the

EM, bird nest surveys were conducted in all cases prior to construction. According to the EM, blasting mats were often not used, particularly in steep terrain, contrary to the CEMP. MOE recommends that blasting mats be used in all cases, excluding exceptional circumstances where their use is not possible. (Malt)

4.2 Stave & Lamont: According to the EM, Harlequin Duck surveys were not conducted prior to construction in riparian areas (i.e. within 50m of the stream), contrary to the CEMP. Professional consultant felt that these areas were unsuitable habitat because of existing impacts from high levels of activity. (Malt)

5.0 License to Cut

5.1 Lamont: Clearing of Lamont penstock/road ROW occurred immediately adjacent to the river. The Forest and Range Practices Act (FRPA) does not apply in this case because the Occupant Licence to Cut (OLTC) is exempt from Section 51 and 52 (restrictions in riparian reserve and management zones respectively) of the Forest Planning Practices Regulation (FPPR) (Feldes). However, MOE strongly discourages cutting this close to the river, as riparian areas provide high quality habitat for many wildlife and plant species, including species at risk (Figure 4; Malt).

6.0 Use of Forest Service Roads

6.1 Stave/Lamont: Works Permit pending for works on forest service road. (Feldes)

7.0 Land Clearing and Terrestrial Construction

7.1 Lamont: Clearing of ROWs was not limited to 15 m in old-growth forest and 30 m otherwise, as committed to in the CEMP. Clearing of the Lamont penstock ROW was at least 60 m in some areas, and included old-growth forest. MOE recommends that clearing of old-growth should be avoided wherever possible, and the widths of the penstock and road ROWs should be minimized. (Malt)

8.0 Waste Management

8.1 Stave camp: Waste management permit not required because less than a 100 people in camp. Application in progress for permit for next summer, when more than 100 workers are expected. (McFadden)

8.2 Stave camp: Plastic-coated wire was found in incinerator ash. This is not an acceptable item for burning in the incinerator, and this should be avoided in the future. (McFadden)

8.3 Stave camp: Blasting boxes were left outside and uncovered. It was recommended that these be covered to protect them from the elements. Also, a burning permit will be required to burn these. (McFadden)

8.4 Stave camp: MOE requested an inventory of fuel, waste oil, and any other potentially hazardous waste material at Stave Camp to determine compliance with storage requirements under the Hazardous Waste Regulation (Larsen, McFadden).

9.0 Wildlife-Human Conflict

9.1 Electric fence was not constructed around the incinerator or the camp in general. This was not considered to be problematic given the high standard of waste management being conducted and the lack of wildlife issues/sightings to date. (McFadden)

10.0 Construction Camp – Well Supply

10.1 Well identification plate number on the groundwater well that supplies drinking water to the construction camp was missing. The well identification plate number is required as the groundwater well is used for water supply (see Table 2 in the Groundwater Protection Regulation under the Water Act). The well identification plate can be obtained from the qualified well driller who installed the works. (Davies)

Figures: Stave Lake and Lamont



Figure 1. Construction at Stave intake site. Note pile of crushed rock in background (Stave river is ~ 20 m from the pile on the opposite side).

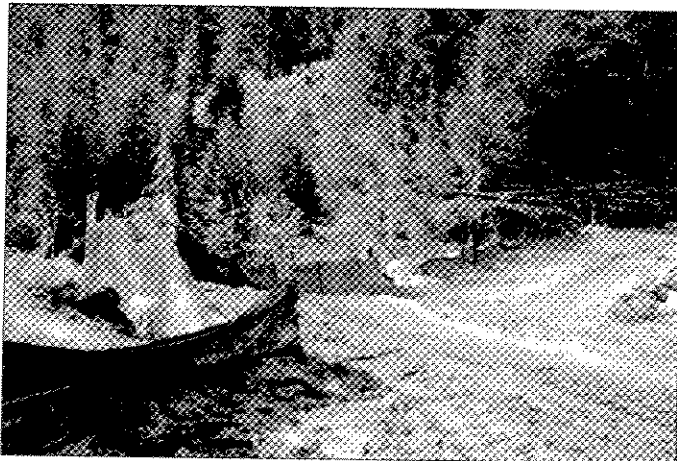


Figure 2. Silt fencing along Lamont access road.



Figure 3. Wood decked on stream-side of river along Lamont access road.

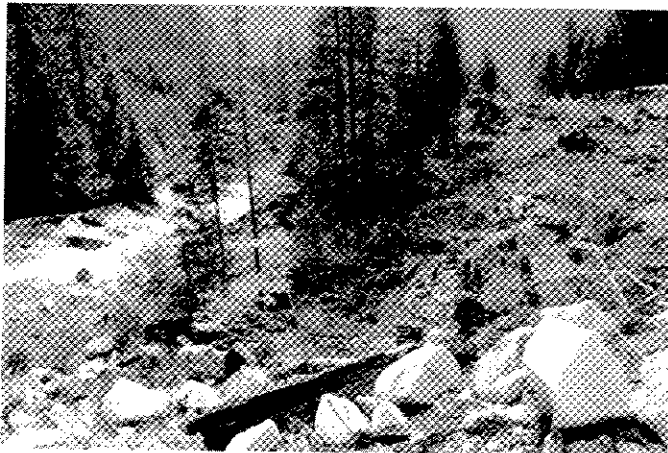
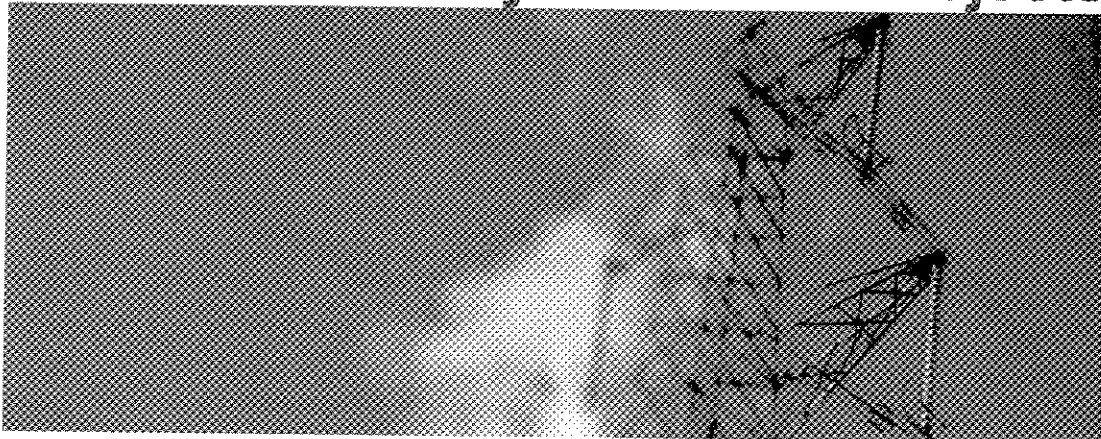


Figure 4. Clearing of Lamont penstock ROW immediately adjacent to the river.

Independent Power Producer (IPP) Inspection Project Report

Stokke and Tipella Hydroelectric Projects



Project: Stokke and Tipella Hydroelectric Projects

Proponent: Cloudworks Energy Inc.

Date of inspection: October 30, 2008

Staff: Josh Malt (MOE-ESD),
Kevin Larsen (MOE-EP)
Sisto Bosa (MOE - EP)
Paul McFadden (MOE-COS), and
Leonard Feldes (MOFR)

Contractors: Peter Kiewit and Sons,
Mike Hedberg (Forestry Consultant)

**Environmental
Monitor (EM):** Elyse MacDonald (PGL)

Sites visited: Stokke: camp, access road, intake, penstock
construction, powerhouse
Tipella: camp, access road, intake, penstock
construction, powerhouse

Results

1.0 Erosion Control

1.1 Stokke: A small slide or side cast of material was observed along the Stokke access road built under the Conditional Water License (~ station 0 + 550m). Rock and soil material had slid down the bank to the edge of Stokke Creek. Given that heavy rains were forecasted for the evening of October 8, there was a high risk of sediment entry into Stokke Creek, which would constitute a violation under the Water Act. Moreover, sediment control structures were not installed down-slope of road building at this location, contrary to commitments under the CEMP. Kiewit/Cloudworks personnel were instructed to promptly mitigate this issue at the debriefing session. The EM confirmed to J.Malt (MOE) that the slide was covered on the afternoon of October 8 to prevent entry of sediment into Stokke Creek. MOE recommends that measures be taken by Cloudworks and Kiewit to prevent similar issues from occurring in the future. (Figure 1 ; Malt, Feldes)

1.2 Stokke: MOE is concerned regarding a shipping container used to stabilize the road at the narrowest portion of the Stokke Creek canyon (the "pinch point"). Mike Hedberg stated that the container was a temporary measure that will be removed once the penstock and road construction is completed. According to the EM, a Leave to Construct had not yet been given for construction at the pinch point, although leaves had been granted for other portions of the penstock and access road. MOE recommends that road/penstock construction should not be initiated until all leaves have been granted, as non-approved temporary works such as the shipping container may be unstable and could result in environmental impacts. (Figure 2; Malt)

1.3 Stokke: A large pile of crushed rock set aside for penstock bedding material had no berm surrounding it to prevent slipping into adjacent forested areas. MOE recommends that a berm be built in this location to prevent slippage. This is particularly important on the stream side, where slippage could cause damage to riparian and instream areas. (Figure 3; Malt)

1.4 Tipella: Large amounts of sediment were observed at the discharge point of a culvert along the Tipella access road. The bank surrounding the culvert was not properly armoured, leading to collapse and high amounts of build-up behind the sediment fences. MOE recommended that the bank be properly stabilized, and the sediment build-up be removed to limit discharge into the forest. (Figure 4; Malt)

2.0 Land Clearing and Terrestrial Construction

2.1 Tipella: Revegetation of the penstock ROW at Tipella was done with a 'non-invasive' seed mix, which includes non-native species, contrary to BMPs and the CEMP. Red Alder has been added as a native component in areas where the roots won't cause damage to the penstock. MOE recommends sourcing of an all-native seed mix to meet commitments under the CEMP. (Figure 5; Malt)

2.2 Tipella: Clearing of ROWs was not limited to 15 m in old-growth forest and 30 m otherwise, as committed to in the CEMP. Clearing for the access road and penstock ROW was wider than necessary, particularly in spoil areas. For instance, clearing above the Tipella powerhouse (immediately above the steep section) was particularly wide (i.e. ~ 100m) because the alignments had been changed post-clearing (according to Hedberg). MOE recommends that clearing of ROWs be limited to the narrowest widths possible, and that respective commitments in the CEMP should be followed. (Figure 6; Malt)

2.3 Stokke: According to the EM, a rare plant community (Douglas Fir / Douglas Maple / Hooker's Fairy bells) will be impacted by the fish habitat compensation channel planned for a location near Stokke camp, contrary to BMPs and the CEMP. MOE strongly recommends all efforts be made to avoid impacts to this rare community. As habitat compensation is designed to mitigate impacts caused elsewhere, it is counterproductive if this compensation causes additional environmental impacts, particularly to an at-risk ecosystem.

2.4 Stokke: According to the EM, an old-growth management area (OGMA) was impacted by clearing of the penstock ROW directly above the Stokke powerhouse. Under the legal order for the Big Silver Landscape Unit, harvesting of OGMA's in this BEC variant (CWHms1) must be limited to a cumulative maximum of 25 ha, and be replaced by an OGMA of equivalent or better quality. According to Cory Bettles (Cloudworks), Mike Hedberg (Forestry Consultant) plans to meet this requirement. MOE staff will follow-up on this issue to ensure that this is the case.

3.0 Streams and Wetlands (General)

3.1 Tipella: A small wetland was observed adjacent to recent transmission line clearing adjacent to the Tipella access road (~1 km marker). Although this wetland has been impacted by previous logging activities, it is still likely to be a viable site for amphibian breeding. The EM is aware of this site and will monitor it to help prevent any damage from future transmission line construction or other activities. MOE recommends

this site as a potential location for habitat restoration as a stewardship/outreach activity for Cloudworks. (Figure 7; Malt)

4.0 Waste management

4.1 Stokke & Tipella: Wood debris (i.e. business waste) piles observed at both Stokke and Tipella sites. Waste Discharge permits are required before these can be burned. (Larsen)

4.2 Tipella: MOE has concerns regarding compliance with the Municipal Sewage Regulation at the Harrison camp. The current system may not be adequate to treat sewage from a camp that size (i.e. according to the design engineer, the system was designed for a 200 worker camp, whereas there are currently 250 workers at Harrison camp). There was evidence that the system was not being operated properly: sewage was discharged directly to the final chamber and septic field, and therefore likely causing pollution. Sewage plant did not have a qualified operator, and data had not been submitted as required. A letter has been sent to Cloudworks from MOE-EP outlining these issues. (Larsen, Bosa)

4.3 Tipella: There was evidence observed at the Harrison camp that an incinerator had been used without a permit. A burning permit is required for camps with more than 100 workers. (Larsen)

4.4 Stokke & Tipella: MOE requested an inventory of fuel, waste oil, and any other potentially hazardous waste material at Stokke and Harrison Camp to determine compliance with storage requirements under the Hazardous Waste Regulation (Larsen, McFadden).

5.0 Wildlife-Human Conflict

5.1 Tipella: Evidence of bear activity was observed at the dumpster and kitchen of the Harrison camp. Garbage was observed in the forest, likely relocated from foraging bears. It appears that bears are entering through a break in the electric fence made for employees to pass through. It was recommended that a gate be installed to rectify this issue (McFadden). MOE-EP needs to issue burning permit so that garbage is no longer stored at site. (Larsen)

6.0 Bird Habitat

6.1 Stokke/Tipella: Construction occurred during the breeding bird season (April 1-July 31) contrary to BMPs and the CEMP. According to the EM, bird nest surveys were conducted in all cases prior to construction. According to the EM, blasting mats were often not used, particularly in steep terrain, contrary to the CEMP. MOE recommends that blasting mats be

used in all cases, excluding exceptional circumstances where their use is not possible. (Malt)

6.2 Stokke/Tipella: According to the EM, Harlequin Duck surveys were not conducted prior to construction in riparian areas (i.e. within 50m of the stream), contrary to the CEMP. Professional consultant felt that these areas were unsuitable habitat because of existing impacts from high levels of activity. (Malt)

Figures: Stokke Creek and Tipella

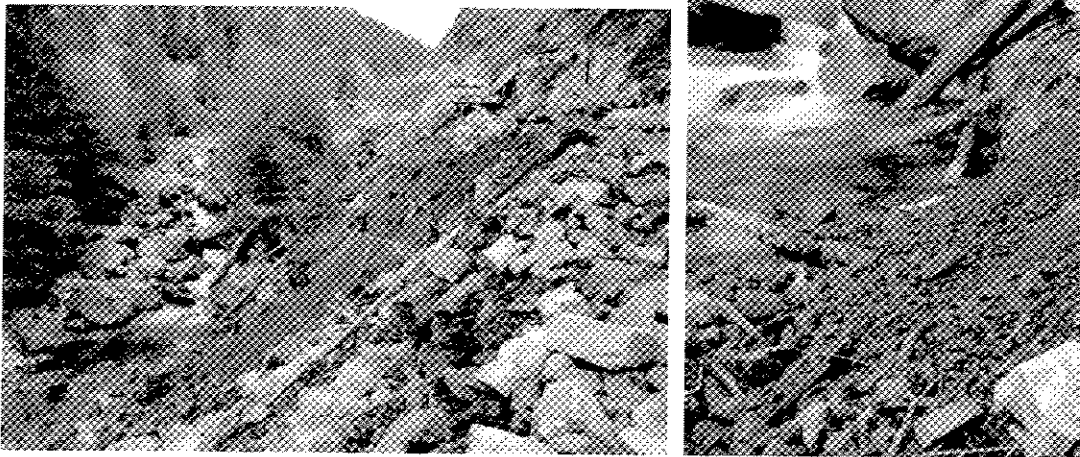


Figure 1. Slide during construction of Stokke access road (left). Material reached edge of Stokke Creek (right).

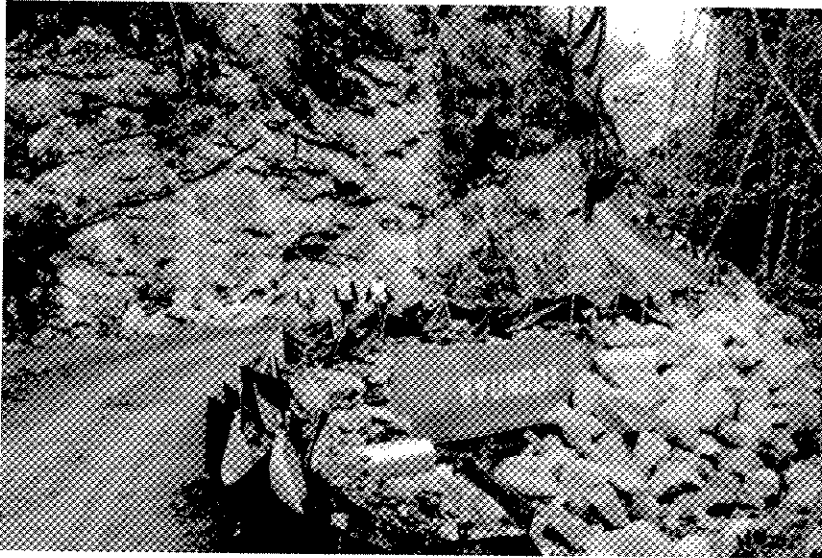


Figure 2. Shipping container used to stabilize the road at the “pinch point” of the Stokke access road.



Figure 3. Crushed rock lacking berm, adjacent to the Stokke access road.



Figure 4. Sediment build-up below culvert along the Tipella access road (left), and collapse of bank adjacent to culvert (right).

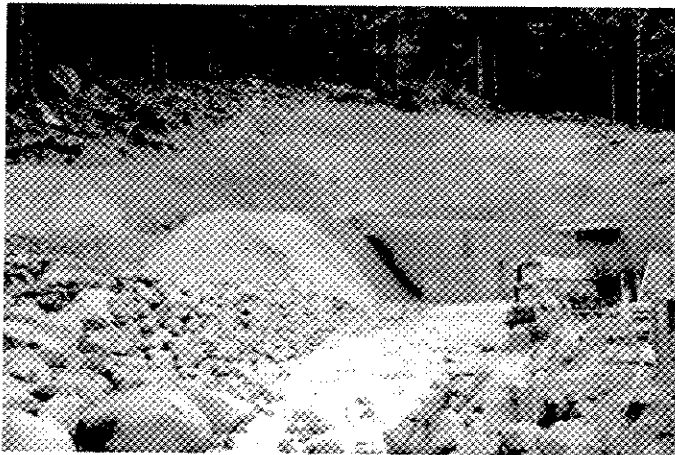


Figure 5. Revegetation above construction of the Tipella intake.



Figure 6. Penstock and access road clearing at Tipella.



Figure 7. Small wetland adjacent to Tipella transmission line clearing (damage is from previous forestry activities).
