



CLOUDWORKS
ENERGY INC.

**Statlu Creek Waterpower Project
Tretheway Creek Waterpower Project
Shovel Creek Waterpower Project
Big Silver Creek Waterpower Project**

Project Descriptions

June 10, 2008

Cloudworks Energy Inc.
403-1168 Hamilton Street
Vancouver BC V6B 2S2

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Statlu Creek Waterpower Project
Tretheway Creek Waterpower Project
Shovel Creek Waterpower Project
Big Silver Creek Waterpower Project

Cloudworks Energy Inc.

1. PROPONENT INFORMATION

The proponent of the Statlu Creek Waterpower Project, Tretheway Creek Waterpower Project, Shovel Creek Waterpower Project and Big Silver Creek Waterpower Project (the Projects) is:

Name: Cloudworks Energy Inc.

Address: Suite 403 - 1168 Hamilton St. Vancouver, B.C, CAN. V6B 2S2

Tel: (604) 633 9990

Fax: (604) 633 9991

Principals:

David Andrews, P.Eng.

Nick Andrews, LLB, MBA

John Johnson, MBA, CFA

Regulatory Contacts for this Application:

Jackie Hamilton, Vice President, Environmental and Regulatory
j.hamilton@cloudworksenergy.com

Judith Romero, Approval Manager

j.romero@cloudworksenergy.com

Company Website: www.cloudworksenergy.com

Cloudworks Energy Inc. is a privately-owned waterpower development company incorporated in British Columbia. The Incorporation number is BC0618367.

2. GENERAL BACKGROUND INFORMATION

2.1 Projects Summary

Cloudworks Energy is seeking approval of four Environmental Assessment Certificates, as follows:

1. Statlu Creek Waterpower Project, approximately 9 MW
2. Tretheway Creek Waterpower Project, approximately 23 MW
3. Shovel Creek Waterpower Project, approximately 16 MW
4. Big Silver Creek Waterpower Project, approximately 31 MW, including the Big Silver Transmission Line, 138 kV capacity, in options of approximately 17 km, 26 km, or 29 km in length

The Projects include four run-of-river waterpower projects and associated powerlines, on fast-water creeks. The electricity produced is equivalent to electricity consumed by 25,000 – 35,000 homes per year in BC. Three of the projects (Tretheway, Shovel and Big Silver Creeks) are in the region of Harrison Lake and would be connected to existing waterpower projects and substation that are under construction in the region. One project, Statlu Creek, is in the region between Harrison and Stave Lakes. It would connect via a new substation near the Chehalis IR 5.

Although the size of each project falls below the 50 MW or greater threshold identified in the Reviewable Projects Regulation, Cloudworks has requested that the projects be reviewed under Section 7 of the Environmental Assessment Act. Section 7 indicates, as below:

- (1) A person who proposes a project that is not a reviewable project under Section 6 of this Act or under the regulations may apply to the executive director for the project to be designated as a reviewable project.
- (2) An application under Subsection (1) must
 - (a) be in writing, and
 - (b) state why the applicant wishes the project to be designated as a reviewable project.
- (3) After considering an application under Subsection (1), and the accompanying reasons, the executive director by order may
 - (a) grant the application by designating the project as a reviewable project, or
 - (b) refuse to grant the application.

The Environmental Assessment Office has consented to review the Statlu Creek Waterpower Project, Tretheway Creek Waterpower Project, Shovel Creek Waterpower Project and Big Silver

Creek Waterpower Project simultaneously in order to allow for an efficient, transparent, timely and cost effective process for government agencies, First Nations and the public.

2.2 Purpose and Rationale

2.2.1 Overview of Run-of-River electricity generation

A typical run-of-river project consists of the following: an intake structure at which water is diverted, a pipeline (penstock) through which it travels downhill, a small powerhouse, and a tailrace where the water is returned to the stream above — or as close as possible to — a barrier to fish movement.

Run-of-river projects are significantly different in design, appearance and impact from conventional waterpower projects. First, there is no water storage other than the limited amount required to submerge the intake pipe. Second, there is no alteration of downstream flows, since all diverted water is returned to the stream below the powerhouse. Finally, flows in the stream between the intake and the powerhouse and works to create fisheries habitat are designed to maintain or increase habitat used by fish.

Potential run-of-river sites must offer a significant gradient (elevation drop) and sufficient annual precipitation rates. Project areas are characterized by features such as fast flows, steep canyons, waterfalls and other natural barriers. These features reduce the suitability of such sites for potentially competing land uses and, most importantly, limit fish presence and diversity. British Columbia has many such sites due to its mountainous terrain, however, not all sites are suitable for development.

Run-of-river power projects use gravity and renewable water resources to generate electricity. Water rentals are paid annually to the Province, which retains ownership of the river. Projects have a design life of 40 years, but can last for longer with refurbishments. Production from waterpower avoids or replaces the production of greenhouse gases from energy from carbon-intensive sources, such as coal and gas-fired power plants which are common in other parts of North America.

2.2.2 Context with the BC Energy Plan

Run-of-river energy projects are an important part of British Columbia's Energy Plan, which was introduced by the Province in 2002, with a significant update in 2007. The Plan sets targets for energy development, management, conservation and efficiency. Targets which are directly related to the development of run-of-river energy are discussed below:

All new electricity generating facilities constructed in British Columbia will be required to achieve zero net greenhouse gas emissions.

For every megawatt of power generated from a run-of-river project, up to 350 tonnes of greenhouse gases are avoided if the energy were to be obtained from a combined-cycle gas-

fired powerplant¹. Currently, BC imports a portion of its electricity from sources that are generated by coal or gas-fired plants.

Ensure self-sufficiency to meet electricity needs by 2016, plus "insurance" power to supply unexpected demand thereafter.

Appropriately chosen and managed run-of-river power projects can supply a large portion of the expected and 'insurance' power demands to meet the energy self-sufficiency goal. Because projects take several years to proceed through initial assessments, approvals, and financing, calls for electricity may be significant in size in the near future in order to ensure that electricity is being produced by 2016.

Ensure clean or renewable electricity generation continues to account for at least 90 per cent of total generation.

These include sources of energy that are constantly renewed by natural processes, such as large and small waterpower, solar, wind, tidal, geothermal, wood residue and energy from organic municipal waste. Run-of-river power generation can range from a few Kilowatts to hundreds of megawatts. Most projects are in the range of 5 to 50 Megawatts.

Maintain our competitive electricity rate advantage.

Run-of-river electricity developers are able to take the long-term financial risks of identifying and developing projects, making agreements and developing infrastructure with First Nations, and arranging the complexities of private-sector construction in order to competitively bid into calls for energy with BC Hydro. The costs of identifying suitable project areas, assessing their potential, and abandoning projects if they are not suitable, are borne by private developers. Financing of projects is amortized over very long periods, keeping the cost to ratepayers competitive with other sources of new electricity in BC. BC enjoys one of the lowest rates for electricity in the world².

2.3 Project Locations

The four projects are located in the Fraser Valley Regional District, New Westminster Land District and Chilliwack Forest District, of the Lower Mainland region of southwestern British Columbia where much of the Province's electricity is consumed. Being close to the load centre, electricity

¹ This figure would be up to 855 tonnes avoided per megawatt, if the electricity is obtained from a coal-fired powerplant. Source: BC Energy Plan. 2007. Province of British Columbia. Page 25

² BC Energy Plan. 2007. Province of British Columbia. p 16

produced in this region reduces transmission losses for electricity ratepayers and mitigates the need to build large transmission lines from remote parts of the Province.

Figure 1 provides an overview of the location of the main project areas.

Statlu Creek

The Statlu Creek project is located in the valley northeast of Mount Catherwood, approximately 29 km northeast of the community of Mission, and 13 km northwest of the Chehalis IR 5. The coordinates of the powerhouse are (UTM10 NAD83) 5466626 N, 568142 E.

Tretheway Creek

The Tretheway Creek project is located near the southeast slope of Robertson Peak, approximately 64 km north-northeast from the community of Mission, and 10 km southeast of the Douglas IR 8. The coordinates of the powerhouse are (UTM10 NAD83) 5506015 N, 566483 E.

Shovel Creek

Shovel Creek project is located near the confluence of Shovel Creek and Big Silver Creek, approximately 8 km upstream (north) of the Big Silver Creek project intake site. The coordinates of the powerhouse are (UTM10 NAD83) 5514785 N, 581594 E.

Big Silver Creek

Big Silver Creek project is located in the valley southeast of Mount Breakenridge, approximately 46 km north of the community of Harrison Hot Springs, and 47 km north-northeast of the Chehalis IR 5. The coordinates of the powerhouse are (UTM10 NAD83) 5505262 N, 582253 E.

The Big Silver Transmission Line has three identified Options as described in the next section.

Figures 2 to 9 depict the project general arrangements. The projects access and general location is described below:

3. PROJECTS OVERVIEW

Each run-of-river project will consist of an intake structure to divert a regulated amount of water away from the stream, a penstock and/or tunnel to convey the water downhill, a powerhouse to enclose the generating equipment, a switchyard, and a transmission line.

3.1 Project Components

Table 1 provides a preliminary summary of the projects components.

Table 1 Preliminary Summary of Project Components

Component	Statlu	Tretheway	Shovel	Big Silver with Tunnel Option	Big Silver No Tunnel option	Big Silver TX Option 1	Big Silver TX Option 2	Big Silver TX Option 3
Gross Head (m)	71.5	262.8	120.0	114.9	114.9	-	-	-
Diversion Length (m)	1840	4435	3120	3020	3020	-	-	-
Mainstem Length (km)	20	20	28	31	31	-	-	-
Capacity (MW)	9.0	23.0	16.0	31.0	31.0	-	-	-
Intake Elevation (FSL) (masl)	286.5	262.8	542.8	245.0	245.0	-	-	-
Headpond Area (ha)	4.1	0.9	1.8	3.1	3.1	-	-	-
Powerhouse Area (m ²)	1457	4890	4450	2840	2840	-	-	-
Tunnel Length (m)	-	-	-	1800	-	-	-	-
Buried Penstock Length (m)	1865	4310	2730	800	2450	-	-	-
Buried Penstock ROW width (m)	same as road	30	30	30	30	-	-	-
Surface Penstock Length (m)	-	-	-	-	190	-	-	-
Surface Penstock ROW width (m)	-	-	-	-	30	-	-	-
New Access Road Length (m) (temporary and permanent)	1000 (temp) 1000 (perm)	1000 (perm) 3000 (temp)	500 (perm) 185 (temp)	900.0 (perm)	1300.0 (perm)	-	-	-
New Access Road ROW width (m)	10	10	10	10	10	-	-	-
Transmission Line Length – new (m)	1100	1400	0	-	-	8700	7400	2000 ¹ / 3400 ²
Transmission Line Length - existing ROW (m)	11500	6600	11000	-	-	8000	18800	23400
Transmission Line ROW width (m)	30	30	30	-	-	30	30	30
Other Construction Use Areas (ha)	6.6	5.1	5.0	6.1	4.8	-	-	-
Estimated Total Footprint Area – Construction (ha)	56	48	47	13	19	50	79	80

1 Land portion

2 Submarine portion

Although these projects are some distance from each other and located in three different watersheds, they can be summarized as follows:

- The combined capacity of the projects is 79 MW, this may increase or decrease slightly based on additional analyses to be conducted prior to submitting the Application
- The projects will all occupy only Provincial Crown Land
- Powerline rights of way, depending on which option is chosen, will utilize in total for the four projects of a range of 39 – 43 km of existing rights of way, and 4.5 – 11.2 km of new right of way
- Up to 10 km of penstock rights of way for the four projects will be buried adjacent to existing forestry roads, of which 1.8 km (Big Silver project) may be a tunnel.
- Approximately 0.2 km of surface penstock will be required in very steep terrain.
- New road access will be minimal, in the order of 5.5 km in total for all four projects.
- During construction, a construction camp, gravel areas, spoil areas and additional laydown and construction areas will be required but will be reclaimed upon completion of construction

All of the watercourses involved are fed by rainwater in late fall and snowmelt in spring and a small amount of melt-water from glaciers. Most of the project general areas contain little or no old growth forest as logging has been going on throughout the region for several decades. There are extensive logging road networks throughout the watersheds.

The penstocks and powerlines will use existing FSRs wherever possible for construction and operations general access. New access road alignments, culverts, bridges, and diversion ditches within the project corridor will be designed, constructed and maintained in accordance with the guidelines of the Ministry of Forests for road construction.

3.2 Preliminary Hydrology and Proposed Works

3.2.1 Statlu Creek

Preliminary Hydrology

Statlu Creek flows east-southeast into Chehalis River and is located approximately midway between Stave Lake and Harrison Lake. Statlu Creek is at the southern limit of the Pacific Range of the Southern Coast Mountains. Most mountain peaks in the immediate area have moderately gentle, rounded, glaciated summits and spur ridges. Valley sides can be quite steep and are typically U-shaped. The nearest long-term WSC gauge is at Chehalis River near Harrison Mills. Correlation with the WSC gauging was undertaken to allow projections of flow for 19 years. The watershed above the intake is 84.6 km² in area. Stream gauging has been in place since 2007. The nearest Water Survey of Canada gauge is at Chehalis River.

Proposed Works

The Statlu Creek Project intake works will consist of a reinforced concrete weir, coanda screen, intake chamber, head control gate, sluice gates, riprap armour, and concrete wing walls. At a normal operating level, the headpond will be sufficient in depth to maintain the submergence of the intake pipe.

The penstock will consist of a combination of low pressure Weholite pipe and high pressure steel pipe. The low pressure penstock will exit the intake structure on the right bank of the river and will be buried along the uphill shoulder of a new access road until the point where it will cross the creek with a pipe bridge and continue to be buried along the uphill shoulder of a left bank new access road. The last section of penstock will consist of buried high pressure and will descend to the powerhouse located on the left bank of Statlu Creek.

The powerhouse will be sited above or armoured to withstand the 200 year flood level. The discharge from the powerhouse will be directed back to a point on Statlu Creek near the powerhouse through a short concrete culvert and a lined canal. The powerhouse will contain two Francis turbines and associated generating equipment that will be utilized to meet plant capacity. The Francis turbines will be designed to continue to accept stream flows if the plants need to shut down suddenly. An outdoor switchyard will be constructed adjacent to the powerhouse. Approximately 1 km of new access road will be required to reach the powerhouse site.

The transmission line will exit the switchyard and will follow a new access road on the left bank of the river until it meets the existing Statlu FSR. The line will follow this existing road heading east to the Chehalis FSR then will continue south along the Chehalis FSR to the BCTC 500 kV right of way. The transmission line will follow the BCTC existing right of way heading east, then will branch away heading south to a new proposed switchyard located near the Chehalis IR 5 that will serve as the interconnection point to the provincial electricity grid.

The project will require the temporary use of land for purposes which may include laydown, spoil, storage (e.g. fuel, explosives) and gravel extraction. Other facilities associated with the project may include a batch plant and construction camp.

3.2.2 Tretheway Creek

Preliminary Hydrology

The project watershed is located in the Harrison Lake drainage area, in the Lillooet Range of the Coast Mountains. Tretheway is on the leeward side of Robertson Peak and tends to have a climate more associated with interior than coastal characteristics. The watershed above the intake is 82 km² in area. Stream gauging has been in place since 2007. The nearest Water Survey of Canada gauges are located at Nahatlach River, below Tachewana Creek, and Stave River above Stave Lake.

Proposed Works

The Tretheway Creek Project intake works will consist of a reinforced concrete weir, coanda screen, intake chamber, head control gate, sluice gates, riprap armour, and concrete wing walls. At a normal operating level, the headpond will be sufficient in depth to maintain the submergence of the intake pipe.

The penstock will consist of a combination of low pressure Weholite pipe and high pressure steel pipe. The low pressure Weholite will exit the intake on the right bank and will be buried slightly uphill and parallel to the existing FSR and will feature a secondary intake located on Coon Creek (a small tributary to Tretheway Creek). The Weholite will continue to be buried parallel to the existing road then will change to buried high pressure steel pipe and continue parallel the road before descending the powerhouse located on the right bank near the outflow of Tretheway Creek. Three kilometres of temporary access to the penstock route will be required for construction purposes.

The powerhouses will be sited above or armoured to withstand the 200 year flood level. The discharge from the powerhouse will be directed back to a point on Tretheway Creek near the powerhouse, through a short concrete culvert and a lined canal. Two pelton turbines and associated generating equipment will be utilized to meet plant capacity. The pelton turbines will have deflectors for each of the jets in the units, which can deflect the flow away from the runners into the inside casing of the units if the plants need to tripped off suddenly. An outdoor switchyard will be constructed adjacent to the powerhouse. The project will require less than 1 km of new access road to reach the powerhouse site, or the powerhouse site may be deemed boat access only.

The transmission line will exit the Tretheway switchyard and will head west along the existing BCTC 360 kV right of way until it meets the existing forestry road that it will follow heading west to the switchyard belonging to the Tipella Creek Project (currently under construction). From there, the Tretheway transmission line will follow the existing Tipella transmission line rights of way to the Lower Lillooet Substation (currently under construction by the Harrison Hydro LP), which will serve as the interconnection point to the provincial electricity grid.

The project will require the temporary use of land for purposes which may include laydown, spoil, storage (e.g. fuel, explosives) and gravel extraction. Other facilities associated with the project may include a batch plant and construction camp.

3.2.3 Shovel Creek

Preliminary Hydrology

Shovel Creek is a large tributary to Big Silver Creek, comprising of approximately one third of the total Big Silver Creek project watershed. Both Creeks are located on the windward side of the Lillooet range with peaks up to 2300 m, therefore they receive considerable precipitation although its inland location tends to a continental climate. The watershed above the Shovel Creek intake is 101 km² in area. Stream gauging has been in place on Big Silver Creek since 2005. The nearest Water Survey of Canada gauges are located at Nahatlach River, below Tachewana Creek, and Stave River above Stave Lake.

Proposed Works

The Shovel Creek Project intake works will consist of a reinforced concrete weir, coanda screen, intake chamber, head control gate, sluice gates, riprap armour, and concrete wing walls. At a normal operating level, the headpond will be sufficient in depth to maintain the submergence of the intake pipe.

The penstock will consist of a combination of low pressure Weholite pipe and high pressure steel pipe. The Weholite will exit the intake on the left bank of the river and will be buried along the uphill shoulder of the existing FSR. The low pressure penstock will change to high pressure steel and will continue to be buried along the uphill shoulder of the road for before it descends to the powerhouse located on the left bank of Big Silver Creek.

The powerhouse will be sited above or armoured to withstand the 200 year flood level. The discharge from the powerhouse will be directed back to a point on Big Silver Creek near the powerhouse through a short concrete culvert and a lined canal. The powerhouse will contain two Francis turbines and associated generating equipment that will be utilized to meet plant capacity. The Francis turbines will be designed to continue to accept stream flows if the plants need to tripped off suddenly. An outdoor switchyard will be constructed adjacent to the powerhouse. Less than 500 m of new access roads will be required to reach the intake and powerhouse locations.

The transmission line will exit the switchyard and cross Big Silver Creek to follow the existing Forestry Service Road heading south along the right bank of Big Silver Creek to the Big Silver Creek Project switchyard where the Shovel transmission line will terminate and the project will then share the Big Silver Creek transmission line which will ultimately interconnect (see Options 1-3) to the provincial electricity grid via the Lower Lillooet Substation (currently under construction).

The project will require the temporary use of land for purposes which may include laydown, spoil, storage (e.g. fuel, explosives) and gravel extraction. Other facilities associated with the project may include a batch plant and construction camp.

3.2.4 Big Silver Creek

Preliminary Hydrology

The project watershed is located in the Harrison Lake drainage area, in the Lillooet Range of the Coast Mountains. The Creek is located on the windward side of the Lillooet range with peaks up to 2300 m, therefore it receives considerable precipitation although its inland location tends to a continental climate. The watershed includes alpine areas in the upper watershed and forested coniferous slopes on the lower mountain sides. The valley is characterized by steep, fast-moving water in the stream, with quick responses to rainfall events. Freshet is typically April/May. The watershed above the Big Silver intake is 292 km² in area. Stream gauging has been in place on Big Silver Creek since 2005. The nearest Water Survey of Canada gauges are located at Nahatlach River, below Tachewana Creek, and Stave River above Stave Lake.

Proposed Works

Presently there are two types of intakes/diversion works being considered for Big Silver due to the high sediment and debris load experienced by the Creek. The first option is to use a reinforced concrete weir, rubber dam, and radial gate to divert the water through a side trashrack into a short tunnel leading to a long concrete settling basin. The other option is to use a large coanda screen intake, head control gate, sluice gates, riprap armour, and concrete wing walls. At a normal operating level, the headpond for either option will be sufficient in depth to maintain the submergence of the intake pipe.

There are two options for the Big Silver Creek Penstock. The first option will consist of a section of buried steel pipe which will exit from the settling basin and lead to a lined tunnel. Upon exiting the tunnel, the penstock will consist of buried high pressure steel pipe which will descend to the powerhouse. The second option will consist of steel pipe that will exit the settling basin and be buried along the uphill shoulder of the existing FSR for the majority of its length. The last segment of penstock will consist of surface mounted high pressure steel which will descend to the powerhouse located on the right bank of Big Silver Creek.

The powerhouse will be sited above or armoured to withstand the 200 year flood level. The discharge from the powerhouse will be directed back to a point on Big Silver Creek near the powerhouse through a short concrete culvert and a lined canal. The powerhouse will contain two francis turbines and associated generating equipment that will be utilized to meet plant capacity. The Francis turbines will be designed to continue to accept stream flows if the plants need to tripped off suddenly. An outdoor switchyard will be constructed adjacent to the powerhouse. Approximately 1 km of new access to reach the powerhouse site will be required including rebuilding an old bridge across the creek. The transmission line will require an access track in order to construct the line, which will be used for operations and maintenance access post-construction.

There are three options being considered for the Big Silver Creek transmission line:

Option 1 – Interconnection to Stokke switchyard via Mount Breakenridge: This proposed route leaves the Big Silver Creek switchyard (located adjacent to the Big Silver Creek Powerhouse) and heads south along Big Silver Main FSR then turns west up the Breakenridge Creek valley, continues northwest to Stokke Creek, then follows the Stokke Creek FSR downstream to connect to the switchyard for the Stokke Creek waterpower project which is currently under construction. The Stokke Creek powerline continues to the Lower Lillooet substation at the north end of Harrison Lake near the Douglas First Nation village of Tipella that is currently under construction.

Option 2 – Interconnection to Stokke switchyard via Gold Creek: This proposed route leaves the Big Silver Creek switchyard and heads north along Big Silver Main FSR, then turns north-northwest up Gold Creek valley, continues west-southwest to Stokke Creek, then follows the Stokke Creek FSR downstream to connect to the switchyard for the Stokke Creek waterpower project that is currently under construction. The Stokke Creek powerline continues to the Lower Lillooet substation at the north end of Harrison Lake near the Douglas First Nation village of Tipella.

Option 3 – Interconnection to Tretheway switchyard: This proposed route leaves the Big Silver Creek switchyard and heads south-southwest (mostly along existing Forest Service Roads) to the eastern shore of Harrison Lake. There it goes into a small switchyard where it becomes a 4 km submarine cable crossing of Harrison Lake (a single insulated ~ 20 cm diameter cable containing three or four lines). The route then follows the Harrison West FSR north to the proposed Tretheway Creek project's switchyard. The Tretheway Creek powerline continues to the Lower Lillooet substation at the north end of Harrison Lake near the Douglas First Nation village of Tipella.

The three options currently being considered are shown in Figures 7 to 9.

3.3 Potential Effects

Run of river waterpower projects are an efficient, renewable and sustainable method of generating electricity, however, their construction requires major civil works. During construction, there are temporary, and potentially significant, effects from clearing and construction activities, most notably potential effects from sediment that could be introduced to streams and temporary effects on wildlife during construction. During operations, the most commonly noted concerns include regulating the instream flows in both fish-bearing and recreationally valuable streams, and potential effects of removal of wildlife habitat along powerline routes.

A detailed Environmental Management Plan has been approved for Cloudworks' other projects in the Harrison Lake region, this will be modified and submitted with the project assessments.

Land and Water Use

None of the project areas are within close proximity to communities. Forestry operations are the main activity in the project areas. Removal of forest timber land base and accommodation of forestry activities will be effects that will be assessed. Mineral tenures exist in the vicinity of the project footprints, however they are not expected to be in conflict as there are no known current mine permit applications in the region. The projects or their powerlines do not affect any designated parks or protected areas.

Heritage and Cultural

Although there are no known archaeological concerns at any of the project locations to date, archaeological impact assessments will be included as part of the Application for an Environmental Assessment Certificate.

Noted below are some additional descriptions and potential effects that are particular to each project:

3.3.1 Statlu Creek

Land and Water Use: The project is entirely located on Provincial Crown Land. Crown Land Licences of Occupation, and eventually, leases, will be sought for the project components. Powerlines will eventually be converted to statutory rights of way. There are no interests in federal

land or federal funding associated with the project at this time, although if the federal government's EcoEnergy incentive program is extended, an application may be submitted for this project. The nearest Indian Reserve is IR5, Chehalis, approximately 13 km southeast of the project. The area has been extensively logged, and forestry is active in the area. There is some recreational kayaking use of Statlu Creek, with a put-in noted on maps, downstream from the powerhouse. Mineral claims are in the region of the project and a mineral 'no-staking' reserve has been applied for by Cloudworks, for waterpower purposes. There are no other water licences, applications, or known water uses on the creek.

Wildlife: Wildlife potentially affected will be species typically associated with riparian areas. These can include Western Screech-owl, tailed frog, and Harlequin Duck (regional concern). The project, particularly the transmission line, is on the edge of the range for Pacific water shrew; however, the line typically follows an existing logging road, passing through extensively logged areas. Assessments will include consideration of a number of species including Northern Goshawk, Spotted Owl, Western Screech-owl, red-legged frog, and Pacific water shrew.

Fisheries: The powerhouse is located over 5 km from the confluence with Chehalis River, on the left bank of the creek. Up to the anadromous fish barrier at the powerhouse site, the creek is inhabited by summer run steelhead, coho salmon, sockeye salmon, longnose dace, Dolly Varden and rainbow trout. Rainbow trout and Dolly Varden are present above this barrier at the powerhouse. The Application will consider instream flows according to published guidelines from federal and provincial agencies.

Cumulative Effects: Impacts from this project in combination with other projects in the region may result in cumulative effects that need to be addressed. Statlu Creek is in the region of several proposed hydro projects, and proposed gravel extraction operations. The status of the approvals process for these projects is currently unknown, but will be investigated for assessment in the Application. The assessment would follow the requirements under the Canadian Environmental Assessment Act.

3.3.2 Tretheway Creek

Land and Water Use: The project is entirely located on Provincial Crown Land. Crown Land Licences of Occupation, and eventually, leases, will be sought for the project components. Powerlines will eventually be converted to statutory rights of way. The nearest Indian Reserve is Douglas IR 8, and the closest community is the Douglas Band community of Tipella (pop. 34), some 11 km northeast of the powerhouse. There are no interests in federal land or federal funding associated with the project at this time, although if the federal government's EcoEnergy incentive program is extended, an application may be submitted for this project. The area has been extensively logged, and forestry is active in the area. Mineral reserves have been placed over Tretheway Creek for waterpower project purposes and there are no prior mineral claims. There are no other water licences, applications, or known water uses on the creek.

Wildlife: Wildlife potentially affected will be species typically associated with riparian areas. These can include Western Screech-owl, tailed frog, and Harlequin Duck (regional concern). There has been a considerable amount of logging within the area with little old or mature forest remaining;

therefore impacts to old-growth dependent species are not anticipated. Goat Winter Ranges are found within the watershed, more than 1 km upstream from the intake. These ranges should not be affected during project construction or operation. Assessments will include consideration of a number of species including Northern Goshawk, Spotted Owl, and red-legged frog.

Fisheries: The powerhouse is located within 60 m of Harrison Lake on the right bank of the creek. A barrier to anadromous fish is located 200 to 300 m above the powerhouse. The diversion reach contains rainbow trout and cutthroat trout. The Application will consider instream flows according to published guidelines from federal and provincial agencies.

Cumulative Effects: Impacts from this project in combination with other projects in the region may result in cumulative effects that need to be addressed. While it is a separate watershed, Tretheway is in the region of a run-of-river project being constructed on Tipella Creek, approximately 4 km north.

3.3.3 Shovel Creek

Land and Water Use: The project is entirely located on Provincial Crown Land. Crown Land Licences of Occupation, and eventually, leases, will be sought for the project components. Powerlines will eventually be converted to statutory rights of way. There are no nearby Indian Reserves. There are no interests in federal land or federal funding associated with the project at this time, although if the federal government's EcoEnergy incentive program is extended, an application may be submitted for this project. There are recreation areas at the mouth of Big Silver Creek approximately 24 km from the Shovel Creek powerhouse. Forest road access in the project area is good in summer, and there may be some temporary effects on recreation during construction. Mineral claims are common in the watershed, though there are no active mines and no known mine permit applications in process at present. The area has been extensively logged, and forestry is active in the area. First Nations land use plans for the vicinity identify the Big Silver watershed as having traditional use as a travel corridor – Shovel Creek is a tributary of Big Silver Creek. There are no other water licences, applications, or known water uses on the creek.

Fisheries: It is confirmed that there are no fish in the Shovel Creek project area based on a historical reconnaissance (Whelen and Associates 1999) and follow up sampling during 2006.

Wildlife: The area has been affected from past logging, but some remnant older forest is present further up the side slopes; however, these areas will not be directly affected during construction. Riparian species present could include Harlequin Duck (regional concern), Western Screech-owl, and tailed frog. Tailed frogs are typically found in creeks in this region, a Species at Risk Act species of concern; however, there are routine methods of mitigation used in the region to protect them. The project is not located on any Goat or Deer Winter Ranges, although they are present approximately 500 metres from proposed facilities. Assessments will include consideration of a number of species including Northern Goshawk, Spotted Owl, Western Screech-owl, grizzly bear, and red-legged frog.

Cumulative Effects: Impacts from this project in combination with other projects in the region may result in cumulative effects. The Big Silver project is 10 km downstream of the Shovel Creek

project, which is in the Big Silver watershed. These two projects are in the region of the Stokke Creek project (currently under construction) that is located in another watershed approximately 14 km northwest. The assessment would follow the requirements under the Canadian Environmental Assessment Act.

3.3.4 Big Silver Creek

Land and Water Use: The project is entirely located on Provincial Crown Land. Crown Land Licences of Occupation, and eventually, leases, will be sought for the project components. Powerlines will eventually be converted to statutory rights of way. There are no Indian Reserves in the vicinity of the project. Culturally sensitive areas have been identified in the region, at the mouth of the creek (15 km downstream of the project area), at the Clear Creek hot springs (Clear Creek is a tributary to Big Silver located below the Big Silver project area) and in the glaciated area atop Mount Breakenridge. There are no interests in federal land or federal funding associated with the project at this time, although if the federal government's EcoEnergy incentive program is extended, an application may be submitted for this project. The area has been extensively logged, and forestry is active in the area. There are recreation areas at the mouth of Big Silver Creek approximately 14 km downstream from the powerhouse. A put-in for paddling is noted on maps, downstream of the powerhouse. Forest road access in the project area is good in summer; hence there may be some temporary effects on recreation during construction. A mineral reserve has been placed over the project area for waterpower purposes, and mineral claims are common in the watershed, though there are no active mines and no known mine permit applications in process at present. There are no other water licences, applications, or known water uses on the creek.

Wildlife: The Big Silver Creek area has been extensively logged in the past with old logging camp sites along the Creek and by Harrison Lake and a well established network of roads. Riparian species present along the creek could include both Western Screech-owl and tailed frogs. Tailed frogs are likely to be present as they are typically found in creeks within coastal watersheds (there are routine methods of mitigation in place to protect them). In addition, Harlequin Ducks, a species of regional concern, likely breed along suitable portions of the creek. Assessments will include consideration of a number of species including Northern Goshawk, Spotted Owl, Western Screech-owl, grizzly bear, and red-legged frog.

Fisheries: The powerhouse is located about 15 km upstream from its outlet to Harrison Lake and 30 m from the left bank of the Big Silver Creek. There are several fish barriers downstream of the powerhouse. A semi-selective barrier located approximately 6 km upstream from the confluence with the lake (i.e., 9 km downstream from the powerhouse location) prohibits the passage of anadromous fish. Resident rainbow trout and Dolly Varden are found from the mouth upstream past the 6 m falls to another barrier located approximately 16 km upstream. No fish have been found upstream of this barrier despite extensive sampling efforts over two years. The barrier at 16 km is located about 500 m above the proposed powerhouse location, thus, the remaining 2.6 km of diversion reach is non fish-bearing.

Cumulative Effects: Impacts from this project in combination with other projects in the region may result in cumulative effects that need to be addressed. The Big Silver project is some 10 km downstream of the Shovel Creek project, which is also in the Big Silver watershed. These two

projects are in the region of the Stokke Creek project, located in another watershed approximately 14 km northwest, which is currently under construction.

Big Silver Transmission Line

Land and Water Use: The transmission line is entirely located on Provincial Crown Land. Crown Land Licences of Occupation, and eventually, statutory rights of way, will be sought for the project components. There are no Indian Reserves in the vicinity of the powerline Options. There are no interests in federal land or federal funding associated with the project at this time. First Nations land use plans for the vicinity identify the Big Silver watershed as having traditional use as a travel corridor. The upper elevations of Mount Breckenridge have been identified as important for cultural purposes. Option 1 skirts the identified boundaries of this culturally significant area and Option 2 avoids the area by routing the powerline on the back (east) side of Mount Breckenridge.

Fisheries: Stream crossings will be clear-spanned, and any riparian clearing will be compensated for according to requirements in the Fisheries Act authorization.

Wildlife: Options 1 and 2 of the powerline are located as high an elevation as possible within technical limitations, and there are expected to be few wildlife concerns as an access restriction plan will be implemented. Option 3 follows an existing road and powerline route along the western shore of Harrison Lake, thereby minimizing impacts to wildlife habitat.

Cumulative Effects: Impacts from this project in combination with other projects in the region may result in cumulative effects that need to be addressed. Forestry is the main activity in the region. A number of mineral claims are present in the region, although there are no known active mine permit applications in review. The transmission line (Options 1 and 2) would connect to the switchyard at the Stokke Creek powerhouse site, which is currently under construction. Stokke Creek is in an adjacent watershed. Option 3 of the line would connect to the proposed Tretheway Creek project's switchyard, which is in a watershed across Harrison Lake and some distance north and west of the project area. Potential effects and residual effects of the connection into Stokke Creek or Tretheway Creek projects would be assessed. The assessment would follow the requirements under the Canadian Environmental Assessment Act.

4. CONSULTATION

Cloudworks Energy Inc. has identified the following First Nations groups that have encompassed the respective project areas in their traditional use territories:

- Douglas First Nation, part of the In-SHUCK-ch Treaty Society: Big Silver Creek, Big Silver transmission line, Shovel Creek, Tretheway Creek
- Chehalis First Nation; Big Silver Creek, Big Silver transmission line, Shovel Creek, Tretheway Creek, Statlu Creek
- Kwantlen Nation: Tretheway Creek, Statlu Creek
- Sto:lo Nation: Tretheway Creek, Statlu Creek

Cloudworks will be providing information to the First Nations, and requesting information on current and traditional uses in the respective areas, which will be assessed for the Environmental

Assessment Act review process. A Traditional Use Study and archaeological overview and impact assessments are currently underway. Cloudworks has contacted Douglas First Nation and Chehalis First Nation to discuss the projects. Cloudworks has met with Kwantlen Nation about other projects in their traditional territories, but has not been successful in obtaining Kwantlen contact about the Projects at this time. No specific comments or concerns about the environmental, social or economic resources affected by the project have been identified to date, although future discussions will request specific input on these topics from First Nations. Participation agreements are being discussed in some cases.

Referrals for these projects have been issued to all the above First Nations by Integrated Land Management Bureau in the past year. The Province of BC and Government of Canada have signed an Agreement in Principle with the In-SHUCK-ch Treaty Society, to enter into negotiations for a Treaty that covers the area of the following projects: Big Silver Creek, Shovel Creek, and Tretheway Creek. None of these projects are located within the In-SHUCK-ch Treaty Settlement (Core) Lands. A First Nations engagement plan will be provided as part of the Environmental Assessment Act Terms of Reference.

Cloudworks has undertaken limited consultation with government agencies at this stage. This project is part of the Fraser Valley Regional District (FVRD). The FVRD remains supportive of green energy production in the regional district and re-zoning is not required. Cloudworks plans to continue to meet with the FVRD to provide information and obtain feedback on projects, as well as hold public open houses in nearby communities during the pre-application and application review periods.

5. SCHEDULE

The EA terms of reference is likely to be submitted in June 2008, with the application expected to be submitted in November 2008.

The proposed development schedule is being prepared for submission in the BC Hydro 2008 Energy Call. If successful in the Call, construction is expected to commence in the early 2010. Development of these projects is expected to follow a design-build approach.

The anticipated project lifespan is at least 40 years, much longer with refurbishments. Some waterpower projects have been operating for close to 100 years. The water licence for these projects is issued for 40 years, and renewal requires an application and re-review of the project. Therefore, a schedule for decommissioning is not foreseeable at this time.

Project phases will follow the approximate schedule below:

Pre-construction: Present to Spring 2010

Construction: Spring 2010 to Fall 2011

Operation and Maintenance: Fall 2011 to Fall 2051 and beyond

Decommissioning/abandonment: approximately 100 years

6. REQUIRED PERMITS

Table 2 provides a listing of permits that are required, or likely to be required for the projects to complete construction. Upon acceptance into the EA process, Cloudworks would seek concurrent permitting for the appropriate provincial permits (i.e. Water Licences, Licences of Occupation).

Table 2 Construction and Operating Approvals

Permit Name	Fed/ Prov/Local	Act/Regulation	Stage Required	Applicant
Temporary (Explosives) Magazine License	Federal	Canada Explosives Act	Construction	Contractor
Crossing Permit for Operation of Commercial Vehicle Across a Highway	Provincial	Commercial Transport Act	Construction	Contractor
Overload Permit for Operation of Commercial Vehicle Along a Highway	Provincial	Commercial Transport Act	Construction	Contractor
Oversize Permit for Operation of Commercial Vehicle Along a Highway	Provincial	Commercial Transport Act	Construction	Contractor
Electrical Work Permit	Provincial	Electrical Safety Act, Electrical Safety Regulation	Construction	Contractor
Road Use Permit or Road Use Agreement (if using existing Forest Services Road or Licensee Road for industrial purposes)	Provincial	Forest and Range Protection Act	Construction	Contractor
Permit to Construct a Waterworks System	Provincial	Health Act, Safe Drinking Water Regulation	Construction	Contractor
Permit to Construct Sewage Disposal System (Option: new septic field discharging <22.7m ³ /day to ground)	Provincial	Health Act, Sewage Disposal Regulation/Environment Management Act	Construction	Contractor
Transport of Dangerous Goods	Provincial	Transport of Dangerous Goods Act	Construction	Contractor
Storage and Dispensing of Fuels Permit	Provincial	Fire Services Act	Construction	Contractor/Owner
CEAA Screening	Federal	Canadian Environmental Assessment Act	Construction	Owner
Environmental Assessment Certificate	Provincial	BC Environmental Assessment Act	Construction	Owner
Fisheries Act Authorization	Federal	Fisheries Act, s. 35(2)	Construction	Owner
Permit for Heritage Inspection	Provincial	Heritage Conservation Act	Construction	Owner
Permit for Heritage Investigation	Provincial	Heritage Conservation Act	Construction	Owner
Licences of Occupation (Crown Land tenure)	Provincial	Land Act	Construction	Owner
Exemption from Requirements Under the Utilities Commission Act	Provincial	Utilities Commission Act	Construction	Owner
Water License	Provincial	Water Act	Construction	Owner
License to Cut (forest on Crown Land, if applicable)	Provincial	Forest and Range Protection Act	Construction	Contractor/Owner
Permit for On-Site Storage of Fuel	Provincial	Environment Management Act	Construction & Operations	Contractor

Authorization to Use Electrical Equipment	Provincial	Electrical Safety Act	Operations	Contractor
Authorization to Operate Sewage Disposal System (if required for a camp) (Option: new septic field discharging <22.7 m ³ /day to ground)	Provincial	Health Act, Sewage Disposal Regulation/Environment Management Act	Operations	Contractor
Air Emissions Permit	Provincial	Environment Management Act	Operations	Contractor
Annual Permit for Electrical Equipment	Provincial	Electrical Safety Act, Electrical Safety Regulation	Operations	Owner
Utility Permit	Provincial	Electrical Safety Act, Electrical Safety Regulation	Operations	Contractor/Owner

7. REFERENCES

M.A. Whelen M.A. and Associates Ltd Fisheries Resources Services. 1999. Big Silver Creek Reconnaissance (1:20,000) Fish and Fish Habitat Inventory. Consultant's report prepared for International Forest Products Ltd.

Figures