John Hart Generating Station Replacement Project

April 2016 Community Construction Update Report #34

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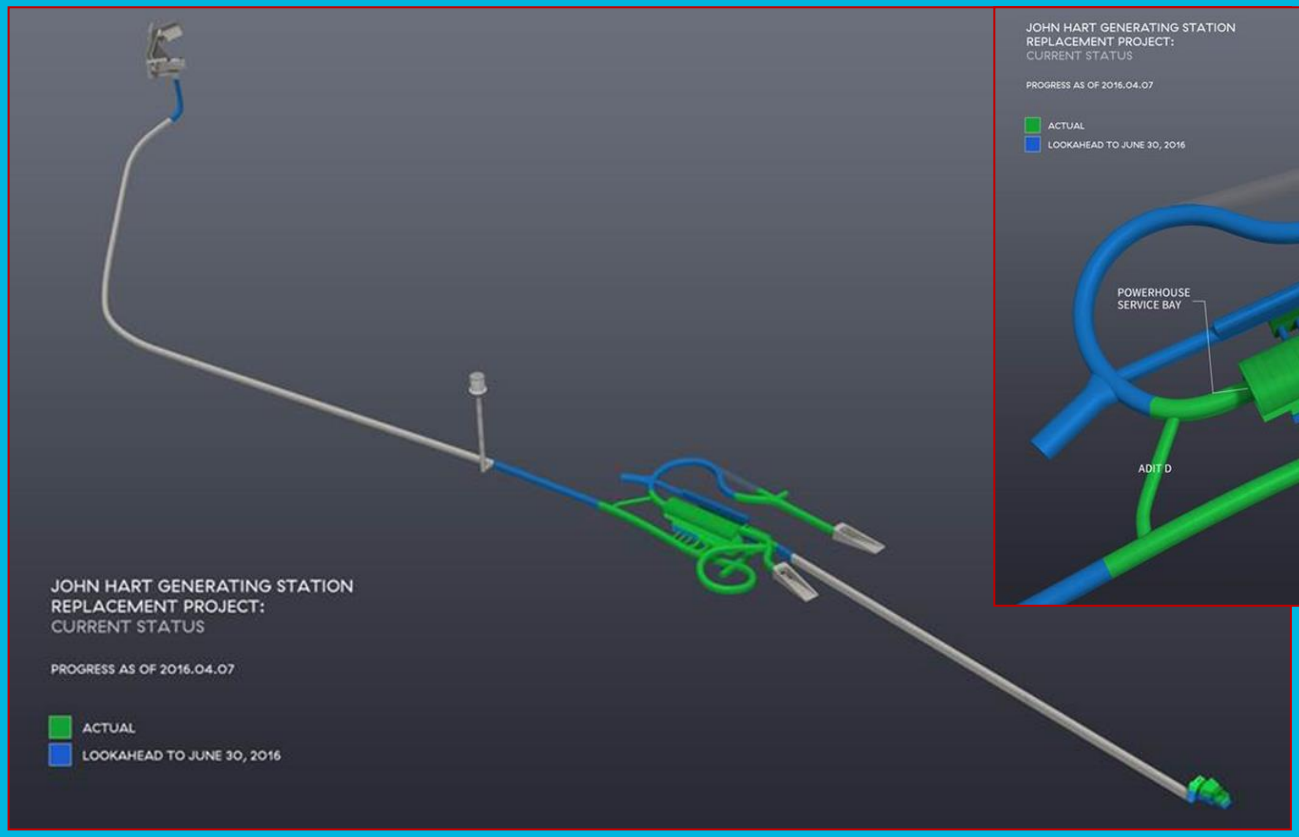
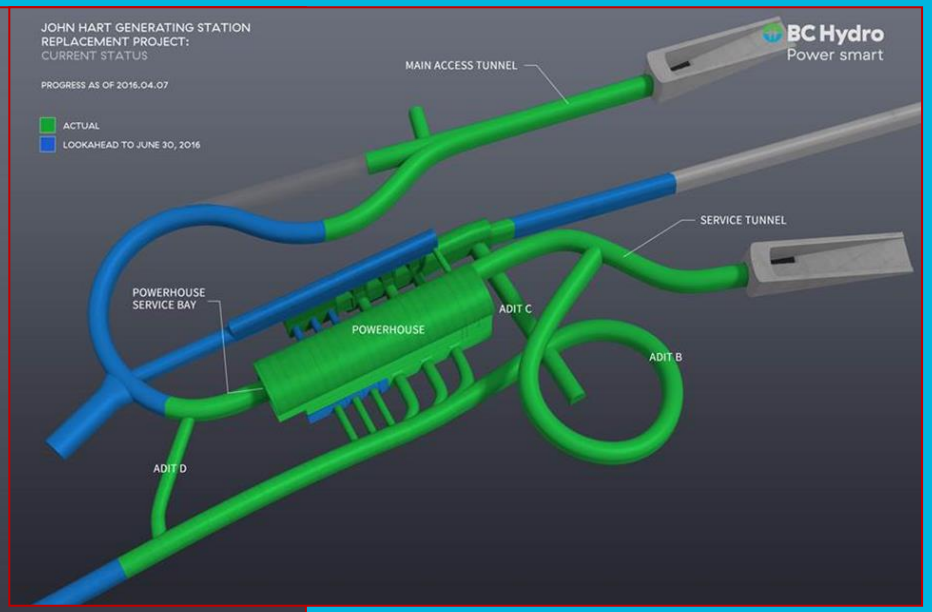
Project Status

- Blasting on the upstream side of the John Hart dam within the cofferdam area has begun, and is progressing well. This will remove 20 metres of depth of rock to allow for the work to begin on the intake gate structure. Eight metres have been removed to date;
- Power tunnel water intake shaft excavation on the downstream side of the John Hart dam has begun. The shaft is 6.5 metres in diameter;
- Crews are beginning the roughly three months of work to complete the narrow and deep (4.5 metres by about 100 metres) vertical surge shaft. Soil and rock excavation at the site continues in preparation for this work;
- All water inlets and outlets within the powerhouse cavern have been excavated and are complete;
- The powerhouse cavern excavation is expected to be finished in early May;
- The tunneling work is now focused on the power tunnel – the 1.5 km tunnel that connects the powerhouse to the John Hart reservoir; and
- The realigned main access tunnel continues forward.

Project Schedule

- May: Concrete work in powerhouse cavern underway;
- May: Tailrace tunnel (6.5 metres x 10.5 metres) excavation will begin;
- June: Power tunnel reaches the surge shaft location;
- June: Intake maintenance gate (upstream) excavation complete;
- July: Power intake shaft (downstream) excavation complete; and
- July: Main access tunnel meets Adit D.





Construction Pictures – John Hart Dam Area

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Construction Pictures – Cofferdam Area

Top picture shows rock removal beside the John Hart dam.

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Construction Pictures – Downstream Work Area Below John Hart Dam Area

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Construction Pictures – Downstream of John Hart Dam

The excavation of the upper part of the vertical intake shaft that will join up with the 1.5 km horizontally located underground power tunnel.

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Construction Pictures – Downstream of John Hart Dam

Before and after from generally the same picture location at the new water intake site on the downstream side of the existing John Hart dam.

Construction Pictures – Surge Tank Area

At top, before and after pictures of the access road to the surge tank work area. Below, the latest work in preparing for the surge tank shaft rock excavation.

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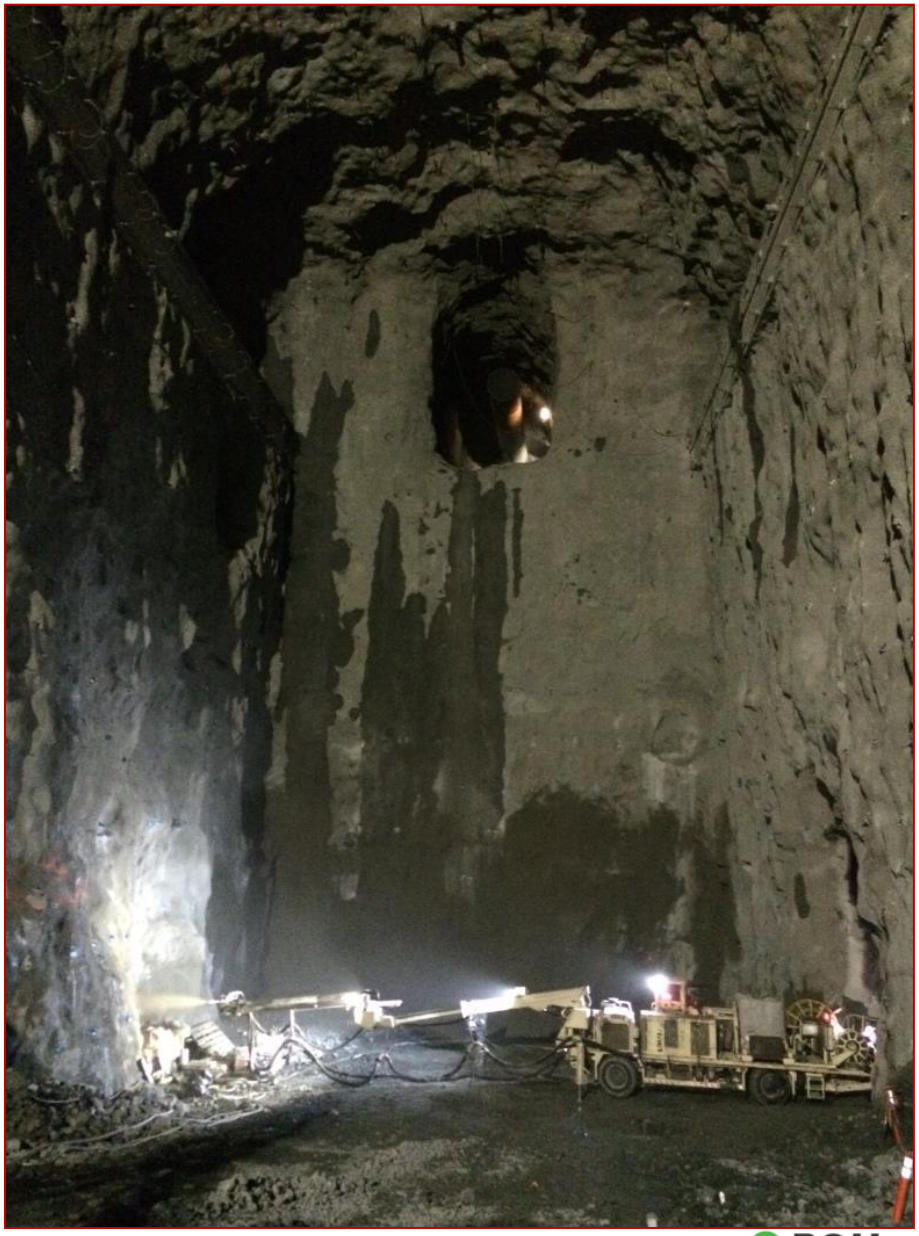
Construction Pictures – Powerhouse Cavern



Left view is looking west, and the right is the east side with the service tunnel entrance near the top.

Construction Pictures – Powerhouse Cavern

This shows two of the three inlet tunnels that will pass water from the power tunnel to spin the three turbines within the powerhouse.

Construction Pictures – Main Access Tunnel

Comox Valley MLA Don McRae, to the right in picture at top left, visited the site to see the project advancements since 2015.

Construction Pictures – Tailrace

Rock scaling – removing loose rock from the wall.

Economic Update – A Good Team

- As of March, project contractor InPower BC has about 285 people working on the site in Campbell River. In total, including the Vancouver-based design and management team, around 310 people are currently working on the project.

- Of the 285 jobs in Campbell River:
  - 60% are original local residents and 12 per cent have moved here for the project;
  - Another 25% are BC residents who maintain permanent addresses elsewhere on the Island or in the province but who are working at the Campbell River site full time (many renting apartments, etc.); and
  - The final 3% are staff from Canada or the United States.

- BC Hydro also has a site team of about ten people working full-time on the project that live in Campbell River. Some have moved to Campbell River. Like InPower BC, there is also a project team based in the Lower Mainland.

Environment Update

- With white-nosed syndrome confirmed in a bat in Washington State, ecologists are watching closely for the potential spread to Vancouver Island of this invasive condition that is severely harming bat colonies in other parts of North America. As a result, the environmental team have provided training for workers on site – particularly those working underground – about what to look for, what to do if a distressed/dead bat is found, and how to report it properly.
- As part of the environmental monitoring plan for near-water blasting, regular nitrogen samples are taken in the river and reservoir. All results to date indicate no impact from the intake blasting on the adjacent waters.
- ASL-JV is working to reduce the spread of invasive plant species – in particular pulling significant amounts of broom (shown below) recently before it bloomed and adding hydroseed to exposed slopes to discourage establishment of the plants.

BC Hydro Capital Projects

Hydro projects to sustain North Island building boom

CARLA WILSON
Times Colonist

The government-funded construction boom on northern Vancouver Island will continue under plans being developed by B.C. Hydro.

While costs are not finalized, Hydro is aiming to invest in major infrastructure projects near Campbell River beyond the $1.093 billion already allocated for the new John Hart Generating Station replacement project, which is under construction.

Future work includes plans to seismically upgrade dams on the Campbell River water system, expand an existing substation and improve other key pieces of infrastructure.

"The context for this is that B.C. Hydro is currently spending about $2.4 billion a year on capital," said Energy Minister Bill Bennett. That figure includes the contentious Site C hydroelectric dam in northeast B.C.

"There was a period of time back in the 1990s when there was very little investment made in infrastructure," Bennett said.

Dams, generating stations, turbines and transmission and distribution lines "have all gotten older so there is a need to upgrade all of this infrastructure," he said.

Hydro has a total of 572 capital projects underway, Bennett said.

The Strathcona dam is the largest on Vancouver Island at 53 metres high and 511 metres wide. B.C. Hydro is proposing a low-level outlet tunnel, in rock, to go underground and around the dam and deep into the Upper Campbell reservoir. This will allow for better water level draw-down capabilities following an earthquake to ease the pressure on the earthfill dam. B.C. HYDRO

The John Hart Generating Station project has 245 people on the job, he said.

Also under construction is the North Island hospitals project. A $331.7-million hospital is being built in Courtenay and a $274.5-million hospital is going up in Campbell River.

Hydro's plans will provide contracts to the construction sector and create jobs on the north part of the Island, even after the generating station is finished.

Work is beginning on a $30-million Hydro substation upgrading project in Campbell River, Bennett said.

That project will add another transformer and four circuits or feeders to the existing station. This will allow it to supply more power as single-family and multi-family housing is being developed.

The substation work is expected to be finished by fall 2017, B.C. Hydro spokesman Stephen Watson said.

Deborah Sargent, Campbell River chief administrative officer, said that this and other Hydro projects are "preparing Campbell River for the 21st century in terms of the substation upgrade and ensuring we have sufficient power as our city grows — and it is growing."

Hydro is eyeing two main upgrading projects to its John Hart Dam and its Strathcona Dam on the Campbell River. The projects are contingent on funding approval from Hydro's board of directors and approval from the B.C. Utilities Commission.

Dam improvements would include seismically strengthening spillway gates to ensure they would survive a one-in-10,000-year earthquake, Watson said.

In the event of an earthquake, the goal is to lower the reservoir as safely as possible to reduce pressure on the dam.

Rebuilding the 810-metre-long earth-and-concrete John Hart Dam would begin after the generating station project is complete, Watson said. Work would probably start in summer 2019 and run for three years, generating jobs for hundreds of workers.

The dam's design is expected to be ready next spring, with an application going to the utilities commission in fall 2018, he said.

Improvements to the Strathcona Dam, which is about half a kilometre long, would follow, but plans are not as advanced as the John Hart Dam.

This project might start about 2020 and last a number of years, Watson said. Hydro would then look at upgrading the dam and eventually replace its power house.

The Ladore Dam, also on this water system, is in line for seismic upgrading of its three spillway gates. The work will likely cost tens of millions of dollars and start about 2018, Watson said.

Hydro's agenda calls for a three-part project to improve the Salmon River diversion canal. A more efficient fish ladder is planned, with work starting this spring.

The concrete canal is to be upgraded in 2017, and an improved system to help salmon and steelhead return to the ocean is slated for 2018.

Campbell River Mirror story on a John Hart project update:
http://www.campbellrivermirror.com/news/374941971.html

People Profile – Nigel Dick

About Nigel

Background:

Currently in Grade 11, Nigel attends Carihi Secondary and is in a co-op program that has connected him with the John Hart project for three months, transitioning into a summer job for July and August.

Home:

Nigel has lived in Campbell River for his entire life.

Hobbies:

Aside from school and work, Nigel also plays rugby, skis, and spends time dirt biking with friends.

Project Responsibility:

As a co-op student, Nigel is on hand to both help the ASL-JV team and to learn from them. He updates documents on site, assists with determining amounts of concrete based on drawings, and provides administration support for field engineers.

“Working on the John Hart project has really helped me choose a future career as an engineer and plan for university. It is a great experience that I will carry with me for the rest of my life.”

Construction – Point Of Interest

Each month, BC Hydro and InPower BC will provide a construction fact, occurrence, or situation.

Tailrace rock blasting and diligently protecting downstream fish habitat.

- InPower BC is excavating downward into the rock and is now encountering conditions that require more sensitive controlled rock blast areas near the operating and aged John Hart generating station. Due to the facility's age, some blasts – even when within all prescribed thresholds – have knocked a turbine offline. Without alternative plans, an unexpected change in turbine activity can affect downstream flows. To be cautious during the tailrace work and with the goal of always protecting downstream fish habitat, on April 13, BC Hydro transferred some flow from the generating station to Elk Falls Canyon during such a blast; the first time we've done that. The operational redirection of flow ensured that fish habitat in the lower Campbell River remains fully covered with water.

- The increased flows in the canyon over a short duration of time was to protect fish habitat downstream of the generating station during a potentially higher vibration blast to start the next level of rock excavation of the tailrace water outlet. The tailrace water outlet facility requires about a 20 metre deep excavation through the rock adjacent to the river. This is being excavated in layers. The initial controlled blast for the start of each layer may have higher levels of rock vibration. The April 13 potentially sensitive blast, and a second one on April 26, presented no issues for the six operating generators.

- Water flows in the canyon were increased to about 80 m3/s and then reduced back to the minimum canyon water flow. Water flow coming from the generating station was adjusted by an equal and opposite amount with the canyon water release. The flow adjustments, from start to finish, were done over about a 12 hour period. Campbell River flows below the generating station remained the same. This type of sensitive blast and a short duration spill event may happen again in the future.

- Campbell River Mirror story link: http://www.campbellrivermirror.com/news/375445911.html

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