

PROPOSED MAYO HYDRO ENHANCEMENT PROJECT (MAYO B)



What is involved?

Electrical loads in Yukon are increasing. By 2011, Yukon Energy expects to need additional renewable power to help minimize the use of diesel to generate electricity. As outlined in Yukon Energy's 20-Year Resource Plan (found at www.yukonenergy.ca), the first priority for increasing renewable energy is through enhancements to existing hydro facilities. As such, Yukon Energy is looking at enhancing the existing Mayo hydro plant, a potential project referred to as Mayo B.



Mayo control structure

What are the benefits?

Yukon Energy is the primary generator of power in Yukon. As electrical load grows in Yukon, the opportunity exists to develop additional renewable energy rather than serve those loads with diesel. The Mayo B project, if developed, will help reduce the future need for running diesel, and enable Yukoners to offset greenhouse gas emissions of up to 28,000 tonnes a year.

Regulatory Approvals/Reviews

No decisions have been made at this time to proceed with this proposed project. Yukon Energy first plans to consult with local governments, stakeholders and the public. Before any project regarding Mayo B moves ahead, government permits and approvals would be required for land use, activities affecting water bodies, and other activities.

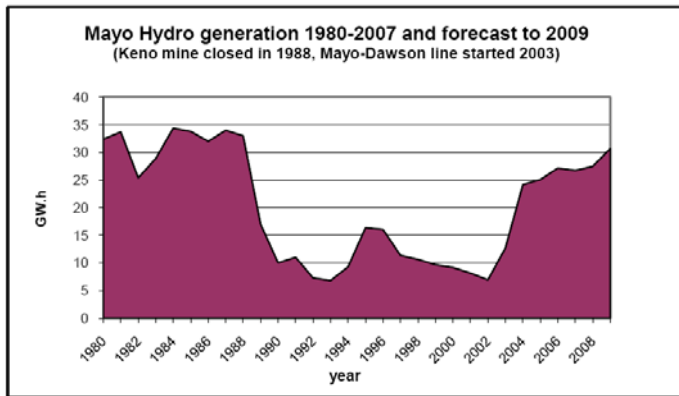
Environmental and socio-economic assessment would be needed under the *Yukon Environmental and Socio-Economic Assessment Act (YESAA)*. An Executive Committee Screening of the project would be done by the Yukon Environmental and Socio-Economic Assessment Board (YESAB). In addition, the project would need a new or revised water licence from the Yukon Water Board.

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The Existing Facility

Operation of the Mayo facility



The Mayo hydro facility supplied the loads of both the Keno mine and the community of Mayo from 1951 until the mine closed in 1988/89. During this period, the plant typically operated at full capacity, and the storage range at Mayo Lake was largely used each year. After the closure of the mine and up until the Mayo-Dawson line was energized in 2003, the plant generated power only for local loads in Mayo and Keno. Since the Mayo-Dawson line went into service, the plant has also provided power to Dawson and Stewart Crossing. The Mayo hydro facility continues to operate below its full capability. The existing

plant has an annual generation capability of just over 40 gigawatt hours (GWh) each year. Regardless of whether the Mayo B project is developed, the Mayo facility will return to operating at its full potential as loads grow and new mines go into production, including using the full range of Mayo Lake storage.

Components of the existing Mayo hydro facility

Wareham Lake: the original project involved construction of a 32 metre high earthen dam that created Wareham Lake. The dam controls the lake levels within a licensed range. From the lake, water passes through an intake structure and a tunnel (approximately half a kilometre) to the generating station.



Wareham Lake spillway



Existing Mayo plant

Generating Station: located on the Mayo River, the plant has two generating units of approximately 2.7 megawatts each, which operate with 36 metres of 'head' or vertical drop between Wareham Lake and the existing generating station.



Mayo Lake

Mayo Lake Water Storage: approximately 40 to 50 kilometres upstream of Wareham Lake, the Mayo Lake dam provides the ability to control the level of Mayo Lake. Yukon Energy's water license sets a fixed maximum controlled lake level. Yukon Energy is permitted to release water to lower the lake from this level (draw it down) by 2.5 metres, which it typically does in the winter. The released water flows to Wareham Lake where it is used to generate power. The Mayo Lake dam is a six metre high rock-filled wood structure that was rebuilt in 1988/89.

The Proposed Mayo B Project

No decisions have been made at this time to proceed with the project. Any decision to proceed will only occur after meaningful consultation with all stakeholders in the Yukon and all permits and approvals are obtained.



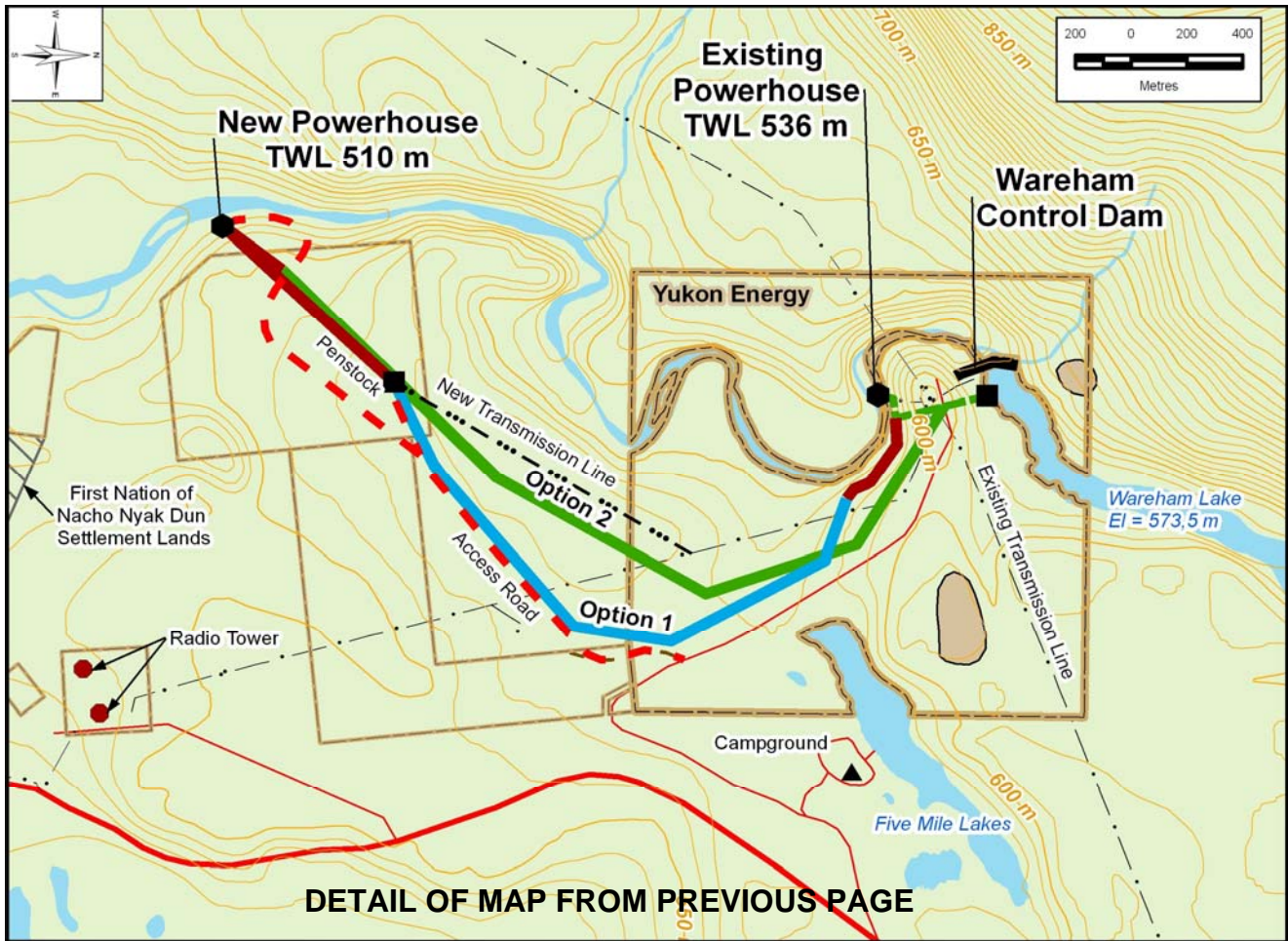
The proposed Mayo B project involves construction of a new powerhouse about three kilometres downstream from the existing powerhouse. The project will approximately double the amount of energy that can be generated from the Mayo River. No changes would be required at Wareham Lake or to the Wareham dam. The current plan is to maintain the existing power house for use as required in the future.

Yukon Energy is proposing to enhance the storage at the Mayo dam by lowering the current licensed minimum level for Mayo Lake. This would allow up to one metre of additional winter drawdown range, leading to a lower spring level than is currently permitted in the water licence. With the large natural spring inflows to the lake, this lower lake level would be temporary each spring.

Mayo B would be developed to help supply Yukon-wide power loads, which is conditional upon the completion of Stage 2 of the Carmacks-Stewart Transmission Project to interconnect the Mayo-Dawson and WAF (Whitehorse-Aishihik-Faro) systems.

Dam safety

The existing Mayo hydroelectric facilities are inspected to ensure the safety of the operation. This includes routine inspections (day to day observations, monthly checklist-driven inspections, and 24 hour equipment monitoring), annual formal inspections by Yukon Energy engineering staff, and an independent dam safety review every five years as per Canadian Dam Association guidelines and current licence requirements. The most recent five-year review was completed in November 2005.



Studies to date

Field studies on the local environment (water, land, wildlife, heritage resources) have been done and preliminary information collected on how people use the area or may be affected by the project.

The following studies have been completed:

- Geotechnical studies (test holes) to assist in determining which project options are feasible;
- Specific aquatic information on the use of the Mayo River by Chinook salmon and the use of Mayo Lake by lake trout, to enable Yukon Energy to address potential effects on the aquatic environment;
- and
- A heritage resources assessment has been completed.

The collection and analysis of data is on-going and will be used to help predict the potential effects of Mayo B on the existing environment and assist in shaping the project details.

The project concept is still being developed. Results of the public consultation process will help shape the project.



Project Components and Options

There are four parts to the Mayo B proposed project:

New Powerhouse

The new powerhouse will result in a total head or drop in elevation (between Wareham Lake and the new powerhouse) of 65 metres. By developing more head, the same water can be used to generate more power. It would include two to three turbines with a plant capacity of approximately 13 megawatts. The plant would be large enough to allow most of the river flow to be used to generate power, compared to the existing plant that results in some of the water being spilled or wasted.

The powerhouse would be set back from the river and would be built on a bedrock foundation. Its tail-race (a component of the powerhouse that directs the flow of water once it has passed through the turbines) would extend to the Mayo River.

Water Diversion Options

A major part of the Mayo B project would be the construction of a mechanism to divert water from the existing intake to a new powerhouse.

Option 1 - canal and/or penstock (see map page 4)

Moving water at or near the land surface using a canal and/or a penstock (a pipe likely buried about one to two metres beneath the surface). This conveyance would begin at the existing intake tunnel and be approximately three kilometres long. It would follow the land contours before heading off the ridge into the new powerhouse.

Option 2 - tunnel (see map page 4)

Moving water using an underground tunnel approximately 3.5 metres in diameter and 3,200 metres long. It would be buried 65 to 100 metres below the ground surface tapping into the existing tunnel near the intake at Wareham Lake. Located near the new powerhouse, the tunnel would convert to a penstock that would run about 200 metres into the powerhouse.

Water Storage Improvements

Revising the licensed drawdown range at Mayo Lake (from 2.5 metres today to 3.5 metres) requires very little change to the Mayo Lake dam. Some of the pipes that release water would need to be replaced with larger pipe, to allow the lower storage range to be used.

Additional Infrastructure

- New all-weather access road along the Option 1 alignment to the new powerhouse.
- Possible changes to the sub-station at the existing Mayo generating station
- Distribution line to new plant
- Pits for sand and gravel if Option 1 is chosen
- Site for stockpiling tunnel rock if Option 2 is chosen
- Temporary work camp for 50-75 people for up to two years

Construction activities would include clearing, tunnelling and/or penstock excavation, and heavy equipment operations associated with building an access road and power house.

Opportunities for Public Engagement

Public involvement is important to help Yukon Energy plan and shape the Mayo B Project, and to help YESAB carry out its environmental and socio-economic assessment of potential project effects. Yukon Energy's consultations to date with key stakeholders in the vicinity of Mayo (First Nation of Nacho Nyak Dun, Village of Mayo and the Mayo Renewable Resources Council) focused on summer and fall field study issues. More consultation opportunities are now planned with the First Nation of Nacho Nyak Dun, key stakeholders in the Mayo and Whitehorse areas, and the broader Yukon public. Future consultation will occur in the New Year after Yukon Energy's filing with YESAB.

Public Involvement Opportunities Before a Filing with YESAB

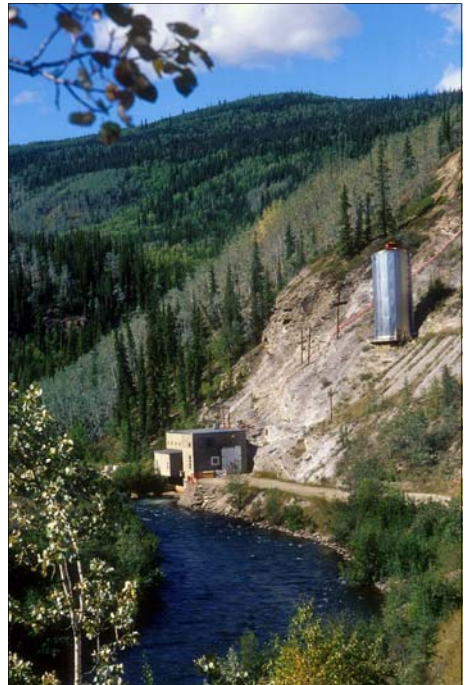
Project Introduction and Issues Identification

Potential Project Effects and Mitigation

Public Communication After a Filing with YESAB

Fall 2008
Yukon Energy is currently introducing the project and seeking feedback on issues of concern, planning options, potential project effects and mitigations.

First Quarter 2009



Existing Mayo generating plant



Mayo control structure

Comments? Questions?

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