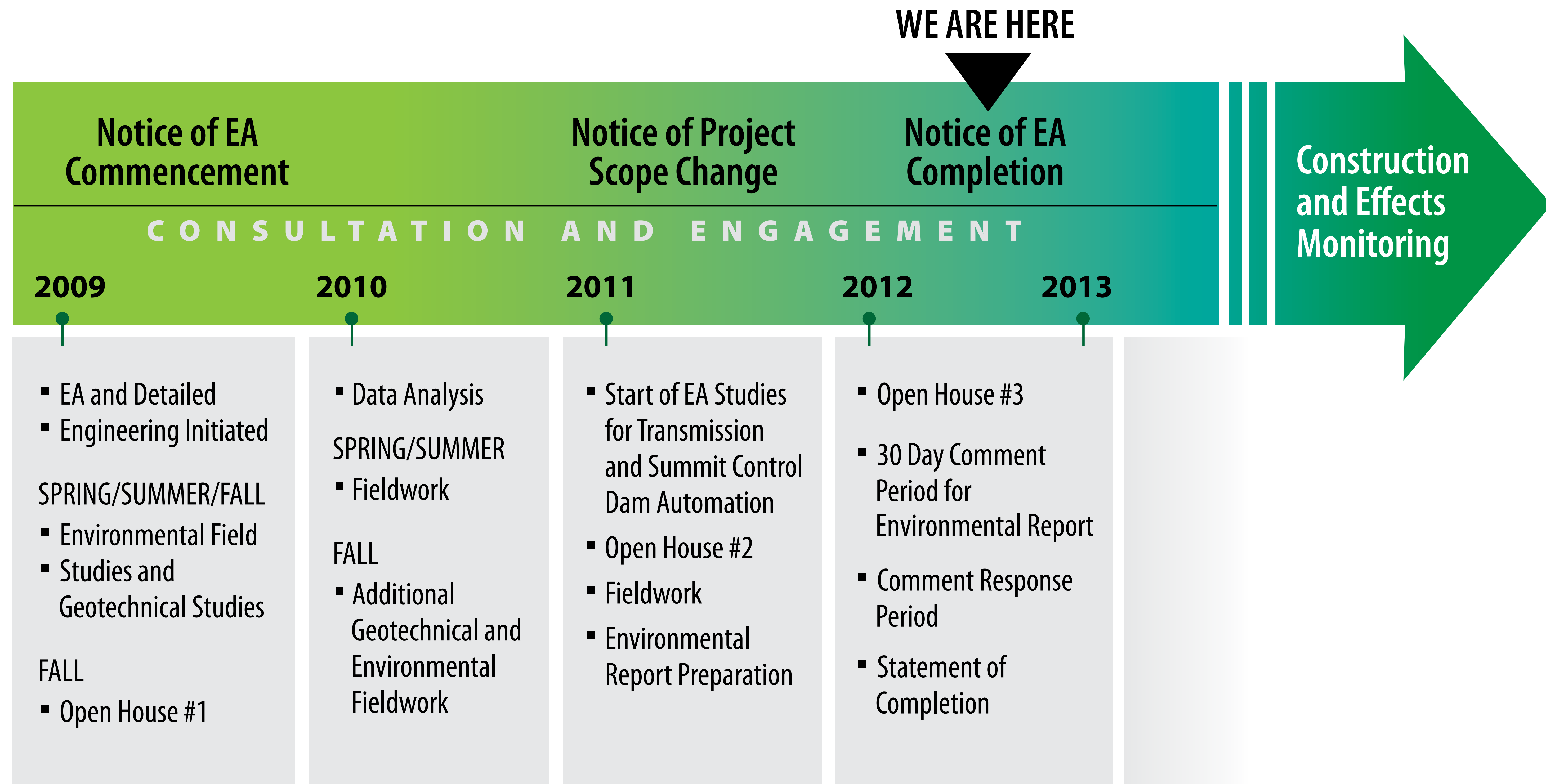


Purpose of this Open House

- Update on Ontario Power Generation Inc.'s (OPG's) proposal to develop a hydroelectric generating station (GS) on the Little Jackfish River.
- To review our preliminary conclusions on the environmental assessment and engineering studies including the proposed transmission corridor.
- To confirm we have addressed your environmental concerns and issues throughout the environmental assessment process.
- To present the next steps as we proceed to produce the Environmental Report and release it for review and comment at a later date.



Where are We in the Environmental Assessment Process?



For a full description of the planning process, refer to the Provincial Class Environmental Assessment for Waterpower Projects, approved under the *Environmental Assessment Act*, 2008. Copies are available from www.owa.ca

For information regarding the Federal Environmental Assessment process under the *Canadian Environmental Assessment Act* please visit www.ceaa.gc.ca

Proposed Generating Station

The proposed Project is an approximately 78 megawatt hydroelectric generating station (GS) on the Little Jackfish River, 75 kilometres east of Armstrong along the Pikitigushi/Jackfish Road.

The GS includes the following structures:

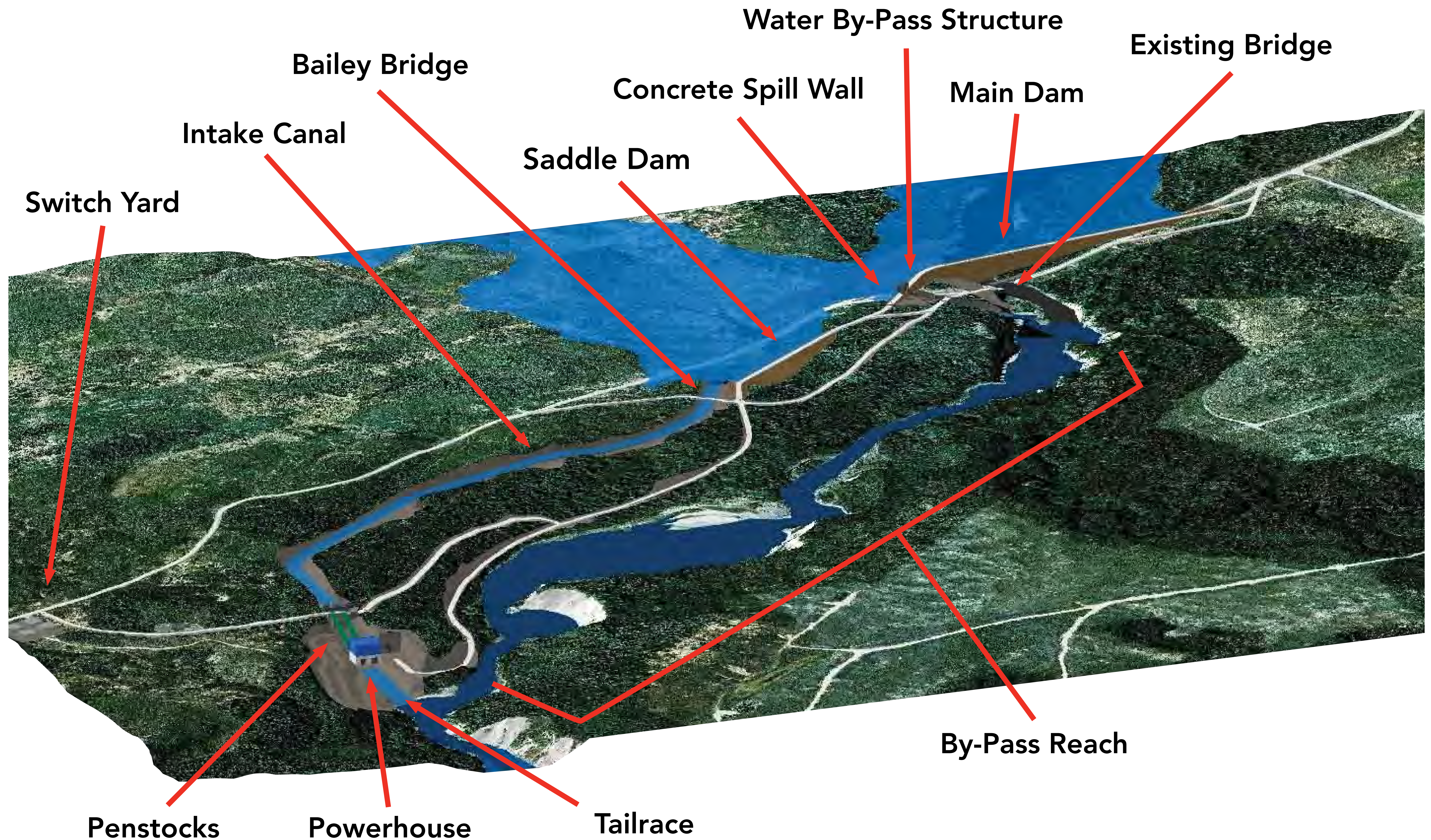
- Powerhouse to contain 2 Kaplan turbine-generator sets.
- Main earth dam 20 metres tall and 600 metres long.
- By-pass structure in the dam to pass high flows around the proposed GS.
- Smaller by-pass structure in the dam to pass continuous, year-round flow to help maintain the ecological health of the river between the dam and the powerhouse.
- 3 kilometre power canal to direct water from the head pond to the powerhouse.

During construction, access roads, a large temporary work camp to house 350 workers and a concrete batch plant would be needed near the site.



Site for the proposed hydroelectric generating station

Design Concept

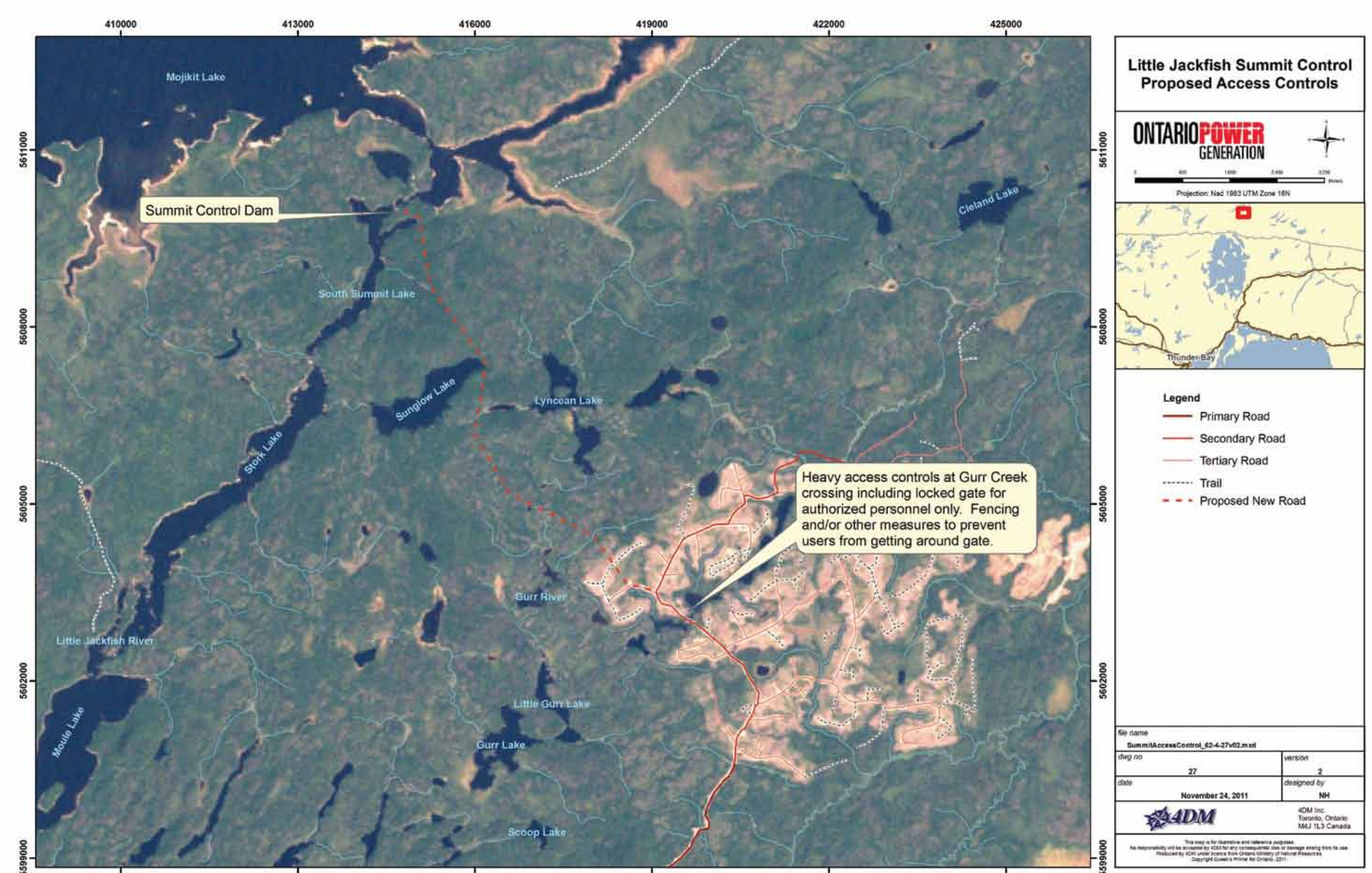


Automation of Summit Control Dam

- The existing Summit Control Dam, located at the north end of the Little Jackfish River and south of Mojikit Lake, needs to be automated to allow for improved storage in the Ogoki Reservoir to optimize electricity production at the GS.
- Three new automated vertical lift gates, complete with hoists and hoist towers, will be added to the dam. The existing manually operated sluice gates will also be maintained and the dam will also be repaired to extend its useful life.
- Access to the dam will be required for construction, operations and to provide electricity to power the automated gates:
 - Existing primary "North" Road will be used for construction and operation access. This road extends north from the GS site but does not reach the dam.
 - 10 kilometres of new road to be constructed to provide full road access.
- Proposed access restrictions and controls at Gurr River would prevent non-traditional access beyond this point and maintain remoteness of the area.



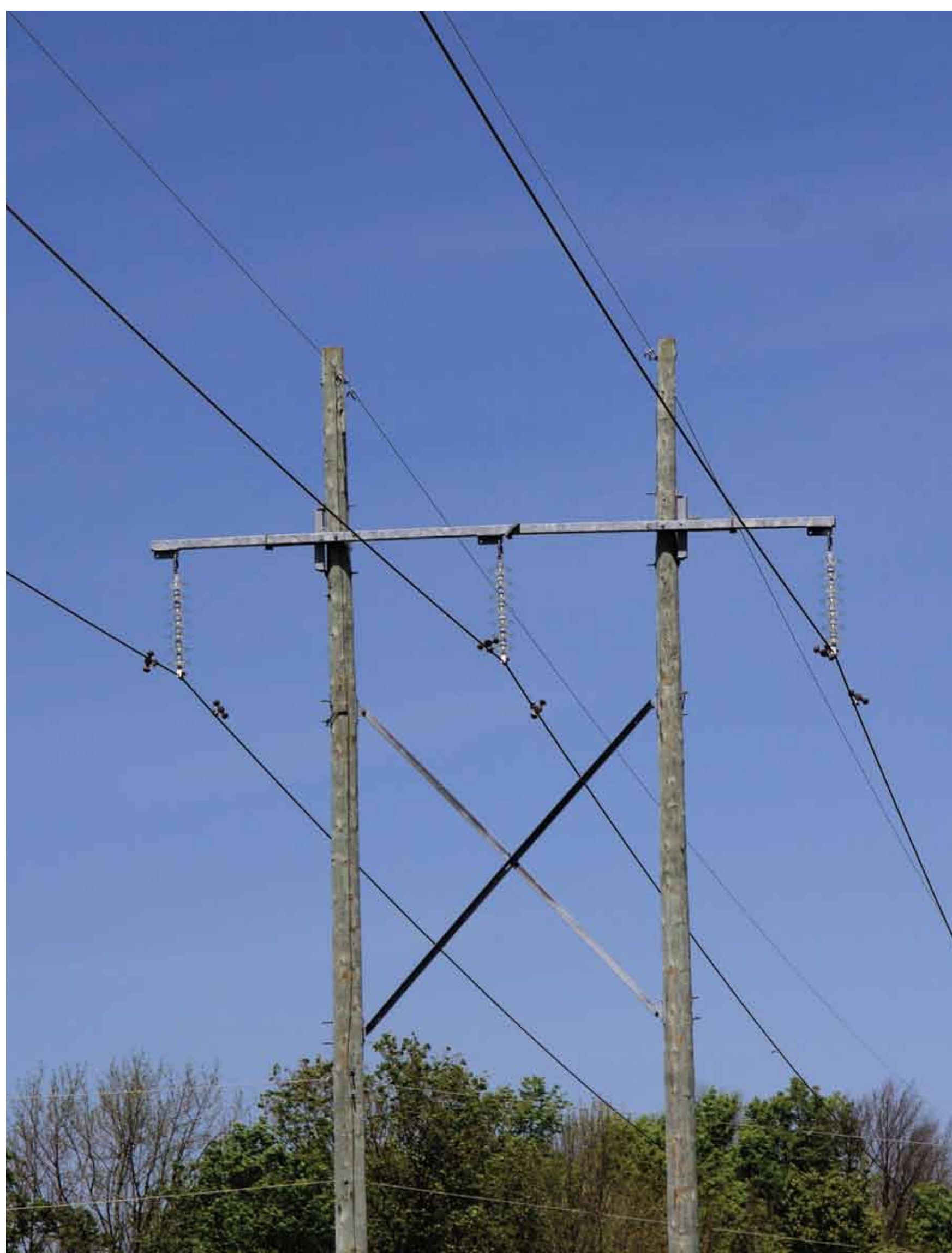
Summit Control Dam at the south end of Mojikit Lake



Proposed new road to complete road access to Summit Control Dam

Proposed Transmission Facilities

- New substation (100 metres by 100 metres) near the powerhouse to transfer the electricity from the GS to the transmission lines.
- New 230 kilovolt transmission line from the GS to the provincial grid, east of the Town of Nipigon, at Kama Bay
 - 180 kilometres long
 - 45 metre wide corridor
- New 25 kilovolt transmission line to connect the GS to Summit Control Dam
 - 40 kilometres long
 - 8 metre wide corridor
- New transformer station along Highway 17, near Kama Bay, to connect the transmission lines to the provincial energy grid.

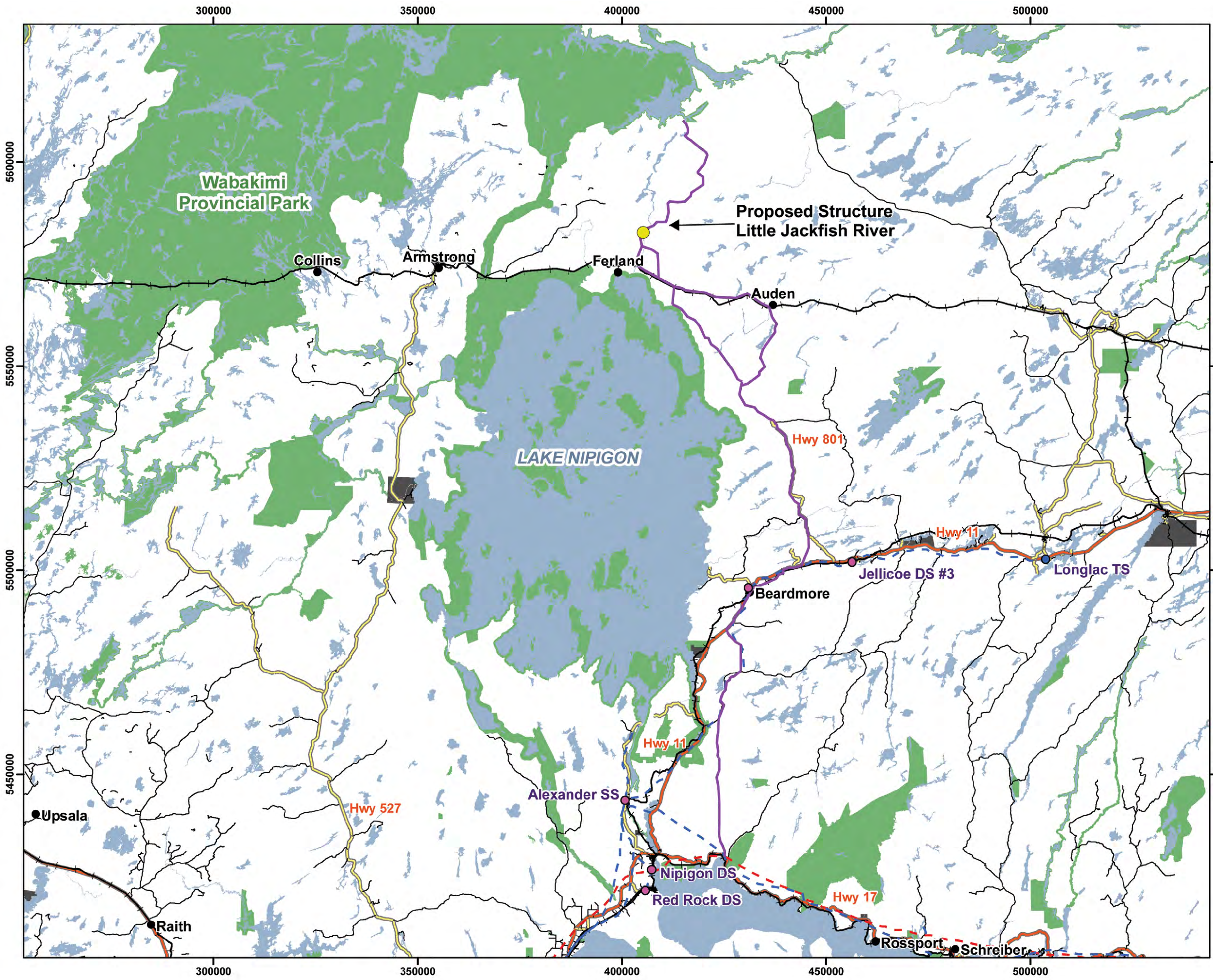


Example of a wood pole transmission line



Example of a substation, Pine Portage GS

Proposed Transmission Corridor



Proposed Little Jackfish River Transmission Line

01020304050

km

Projection: Nad 1983 UTM Zone 16N

Proposed Little Jackfish Development

- Proposed LJF Structure
- Proposed Transmission Line

Transmission & Distribution

115 kV Circuit	115kV Transmission Station
230 kV Circuit	Distribution Station

Base Layers

Railway	Settlement
Highway	First Nation
Primary Road	Protected Area
Secondary Road	Waterbody

file name Centreline_62_4-31v03_11x17.mxd	
dwg no 31	version 3
date January 20, 2012	designed by NH

4DM Inc.
Toronto, Ontario
M4J 1L3 Canada

This map is for illustrative and reference purposes.
No responsibility will be accepted by 4DM for any consequential loss or damage arising from its use.
Produced by 4DM under license from Ontario Ministry of Natural Resources.
Copyright Queen's Printer for Ontario, 2012.
Copyright Department of Natural Resources Canada. All rights reserved.

Transmission

Route Selection Strategy

- Find the shortest route that follows existing features such as:
 - permanent primary roads
 - railway lines
 - temporary and decommissioned roads
 - previously harvested forest blocks
 - existing transmission lines
- Find the route that avoids:
 - long water crossings
 - wetlands and wet forest types
 - steep slopes
 - lodges, trapper cabins and homes
- A 400 metre corridor is proposed to provide flexibility during construction when selecting pole locations and the final 45 metre right-of-way.

Construction of the Transmission Line involves the following activities:

- clearing the right-of-way of trees and shrubby vegetation (ground cover to remain)
- timber sorted as per forestry directives
- non-merchantable wood made available for community fuelwood
- slash burnt or chipped and spread on site
- poles embedded into ground and stabilized to site conditions
- wood pole structure assembled
- stringing of wires



Steep slope to navigate



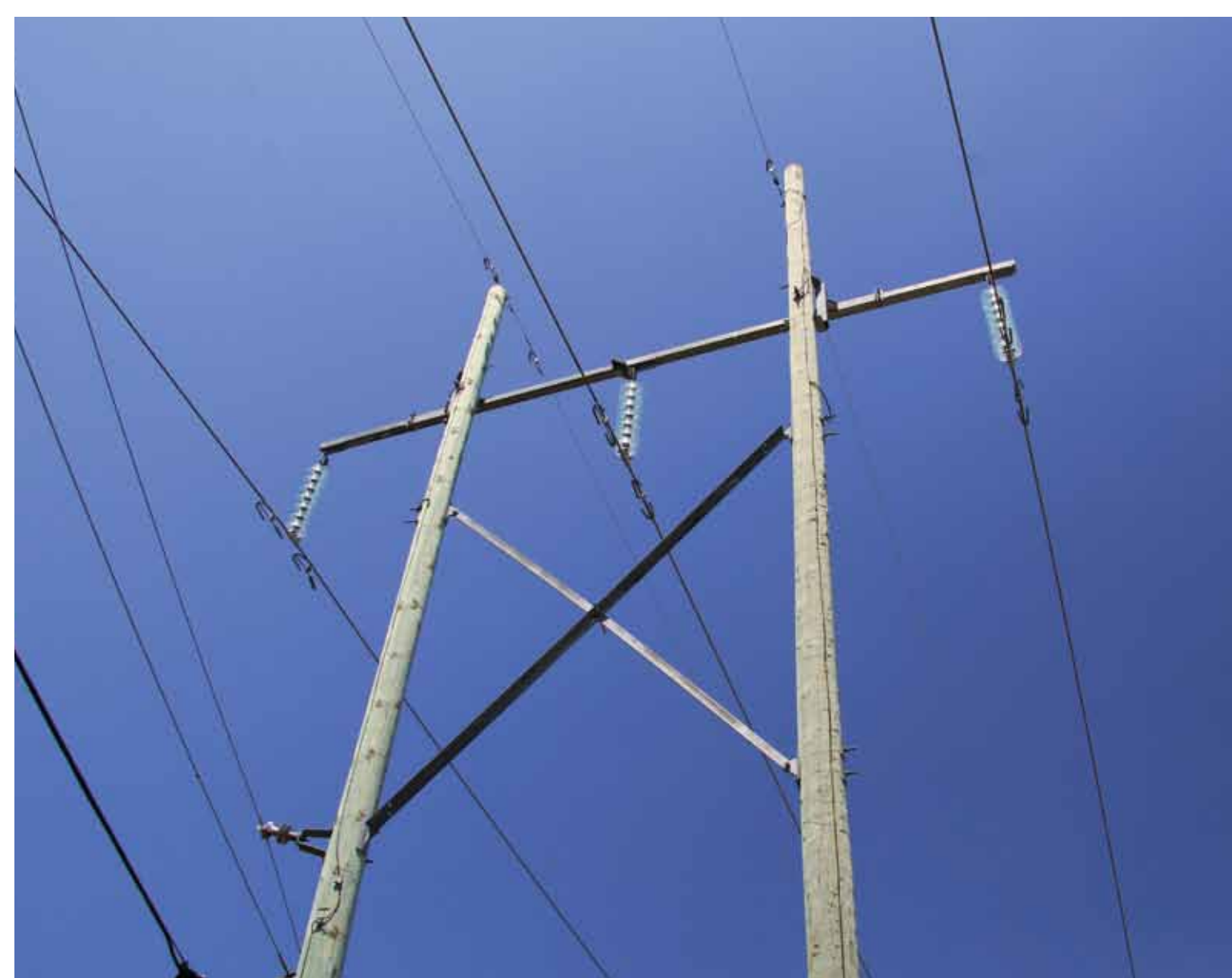
Camp 75 road to follow



Bald Eagle nest at Burnt Island, Frank Lake to protect

Transmission Line Operations

- Inspections and maintenance will be carried out according to best industry practices and legal frameworks.
- **Vegetation Control Program:**
 - ensures there are minimum safety clearances
 - occurs on a five to seven-year cycle
 - promotes compatible ground-level vegetation (grasses)
 - inhibits long-term growth of vegetation that can cause problems
 - involves a combination of methods including, manual/mechanical controls
 - promotes vegetation communities that benefit woodland caribou - a Species at Risk
 - limits the use of herbicides by applying only on areas absolutely necessary with hand-held or vehicle-mounted equipment
- Any herbicide application will require appropriate public notification. Products used will only be those approved for and typically used in right-of-way management in Ontario and Canada, and in accordance with all statutes and regulations.



Summary of Potential Environmental Impacts - Key Findings

Area of Concern	Key Findings	Recommended Mitigation Compensation or Commitment
Terrestrial Environment <i>Wildlife and wildlife habitat</i>	<ul style="list-style-type: none"> Project to use 1,220 hectares of land: 80% for transmission lines, GS, new roads and other ancillary facilities. Remaining 20% required for temporary construction. Project linear infrastructure (roads and transmission corridor) could potentially have negative short or long term effects on woodland caribou. Wildlife populations will be disturbed during construction. 	<div>✓</div> <div>✓</div> <div>✓</div>
Aquatic Environment <i>Fish, fish habitat, river ecosystem erosion</i>	<ul style="list-style-type: none"> Little Jackfish River system is primarily a cool water system with walleye as the main sport fish. Northern pike are also present. Telemetry studies found that fish (mainly walleye) move upstream in the Little Jackfish River system to Zigzag Lake. A barrier to further upstream movement exists at Seven Veil Falls. Two other barriers to upstream migration occur at moderate/high flows below proposed dam site: <ul style="list-style-type: none"> chute beneath the CNR bridge bedrock outcrop in river upstream of proposed powerhouse location. Proposed dam would prevent upstream fish movement to Zigzag Lake. While sturgeon are present in Mojikit Lake, Zigzag Lake and Lake Nipigon, no evidence was found of sturgeon spawning or larval sturgeon around the proposed GS site. Sturgeon do not appear to move upstream beyond the CNR Bridge during spring spawning period. Brook trout are in the vicinity of Major Creek and the junction of the Little Jackfish River. Some fish habitat would be destroyed by GS facilities, and some will be created by new head pond. Mercury levels in fish are predicted to increase in Zigzag Lake, the new head pond, and in the river down stream from the proposed GS. 	<div>✓</div> <div>✓</div> <div>✓</div> <div>✓</div>
Cultural Heritage Environment	<ul style="list-style-type: none"> Archaeological resources identified in areas already disturbed and normally under water as a result of Ogoki Diversion. Artifacts recovered/stored per requirements of <i>Ontario Heritage Act</i>. No archaeological resources found at proposed GS site, ancillary facilities or area to be flooded for new reservoir. No registered archaeological sites identified within the transmission corridor. 	<div>✓</div> <div>✓</div> <div>✓</div>
Socio-economic Environment <i>Jobs, contracting, energy demand, access, tourism industry, construction noise and dust</i>	Provincial and Regional <ul style="list-style-type: none"> Proposed GS would provide up to 78,000 homes with power from renewable energy resource. Provincial electricity demands better met with facility that can take advantage of stored water. \$300 - \$400 million (estimated) in economic spinoffs to the region. 250 jobs (estimated annual average) for 3 years for construction of proposed GS and facilities. 80 jobs (estimated annual average) for 18 months for construction of proposed transmission facilities. Increased demand for sub-contractors, suppliers, labourers, cement workers, equipment operators, carpenters and other key trades people around the region. Local <ul style="list-style-type: none"> Potential effects from pressures of transportation route and construction site outside Armstrong. Minimal impact on forest industry; mining opportunities potentially advanced. Negative effects on remote tourism operation on Zigzag Lake. Access to fishing location at proposed GS site will be removed. 	<div>✓</div> <div>✓</div> <div>✓</div> <div>✓</div>

Existing Barriers to Upstream Fish Migration on the Little Jackfish River System



Narrow CNR Chute



Seven Veil Falls



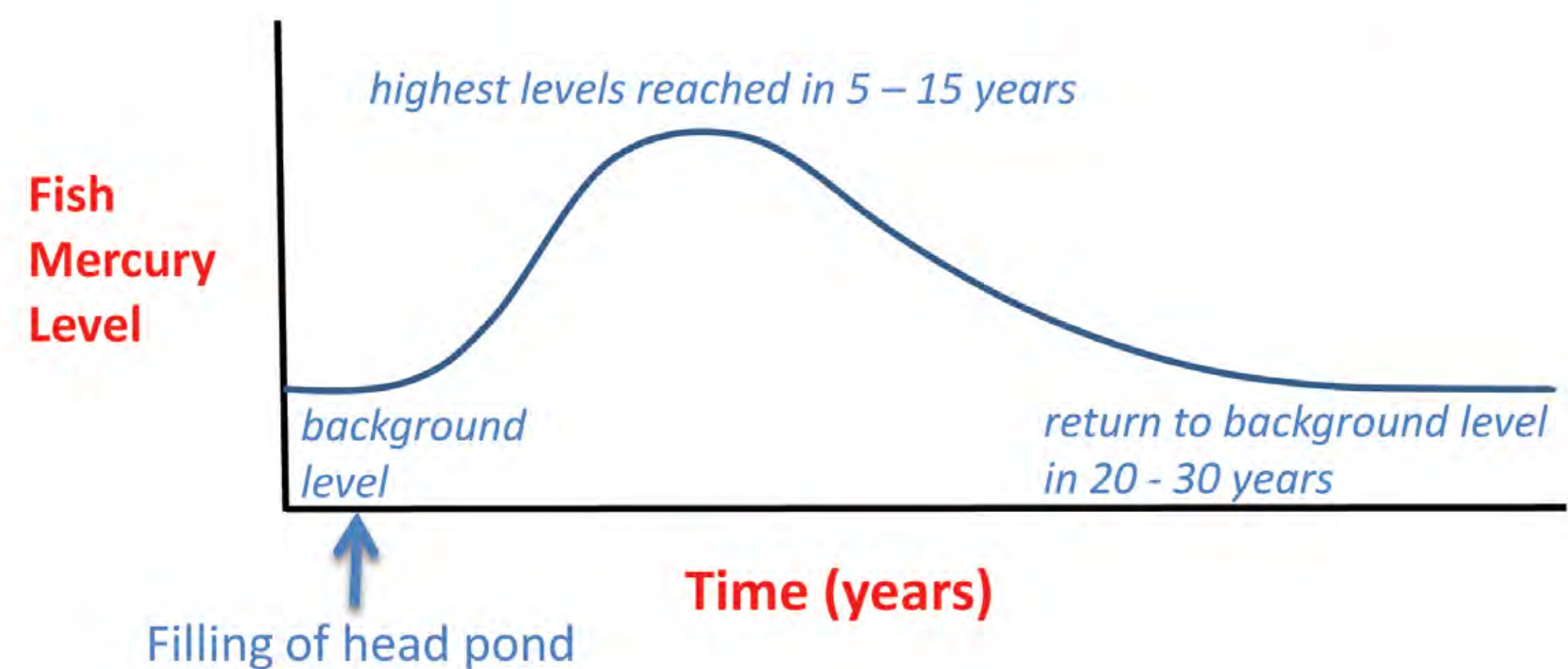
Bedrock Outcrop

Summary of Potential Effects on Fish Mercury Levels

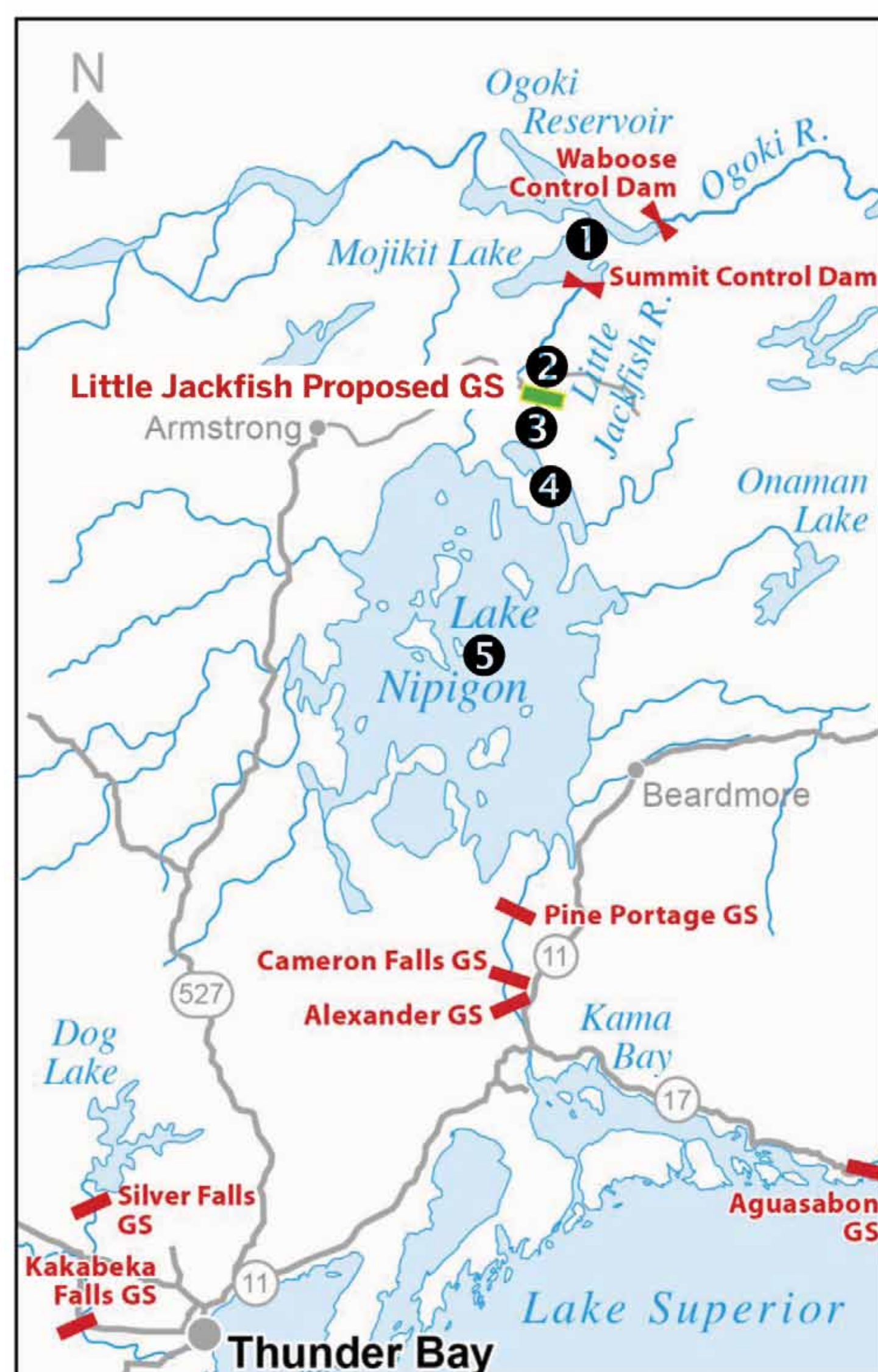
The Project has been carefully developed with concerns about increases in fish mercury levels in mind. While this is a temporary phenomenon, lasting 20 to 30 years, the potential for adverse effects will be limited by reducing the size of the new head pond for the GS, clearing trees before reservoir is flooded and managing operations to limit water retention time.

An open and transparent Post-Construction Monitoring and Communication Program will be carried out with concerned people, the commercial fishing industry and regulatory authorities in order to address concerns about this issue, such as providing updated fish consumption advice to help ensure human health is protected.

Typical rise and fall of fish mercury after filling of head pond for future use in generating electricity



Estimated Change in Fish Mercury Levels for Different Areas of Concern and Consumption Advice*



5 Lake Nipigon

- predict no change to fish consumption advice, subject to monitoring
- predict no increase for fish that do not enter Ombabika Bay or the Little Jackfish River
- individual walleye and pike that travel into Ombabika Bay, stay up the river near GS for a lot of time and later return to Lake Nipigon are predicted to have increased levels
- predict whitefish levels will remain below commercial sale thresholds

4 Ombabika Bay

- predict fish can still be consumed but fish consumption advice may need to be changed following monitoring
- predict increase in mercury levels in water column, lower food web and fish to decline with distance from mouth of river due to natural removal mechanisms
- predict amount of increase in fish to be less than in the area below proposed dam

3 Below proposed dam in Little Jackfish River

- predict fish can still be consumed, but fish consumption advice may need to be changed following monitoring
- predict increase 2-3 times above baseline levels in walleye and other fish-eating species that live in the river all of the time
- fish that spend a lot of time close to GS are predicted to have largest increase (within 2-3 times baseline)

2 Above proposed dam in head pond and Zigzag Lake

- predict fish can still be consumed, but fish consumption advice may need to be changed following monitoring
- predict increase in fish mercury 2-3 times above baseline levels

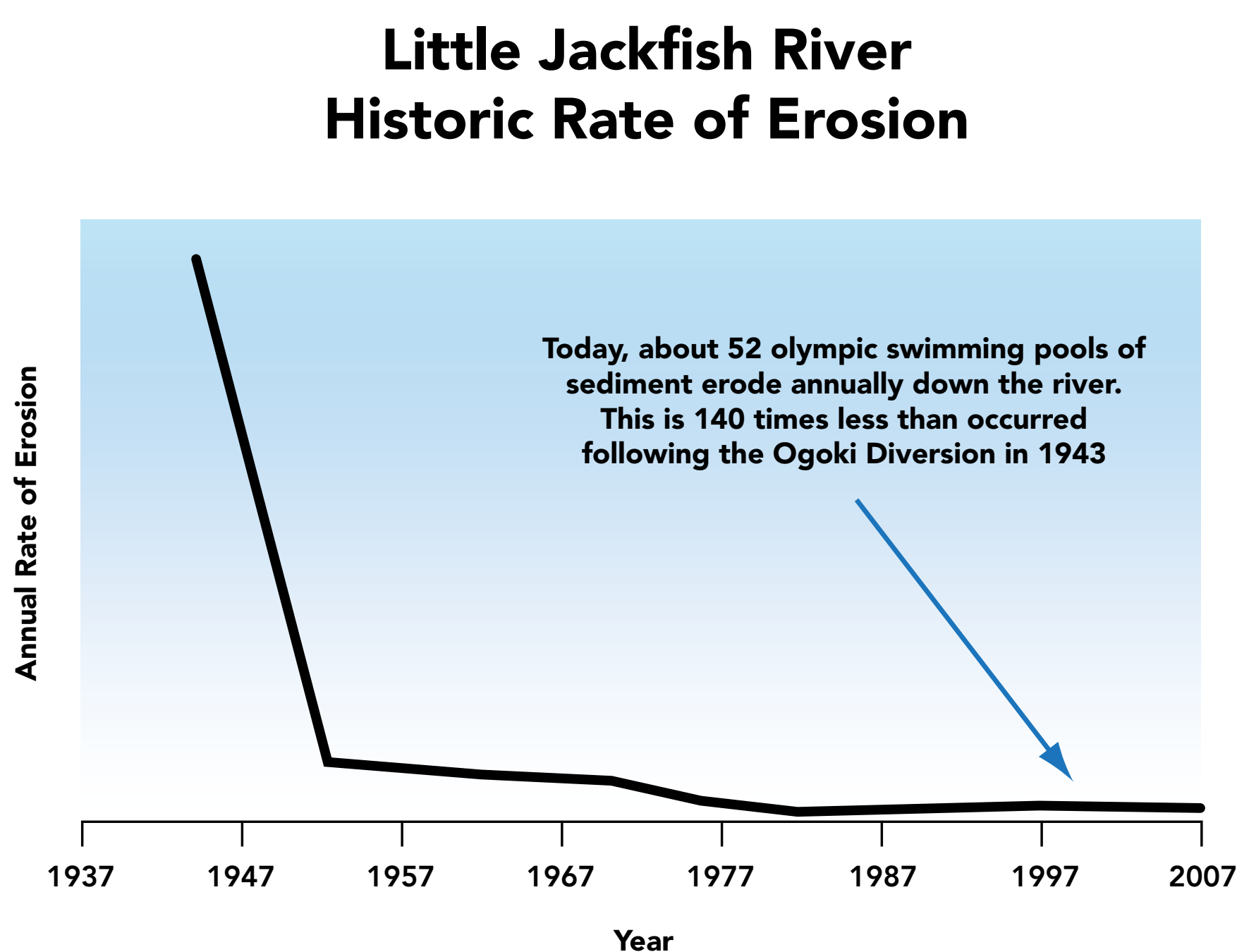
1 Ogoki Reservoir and Mojikit Lake

- predict no increase in fish mercury and no change to fish consumption advice
- no new flooding in Ogoki Reservoir or Mojikit Lake and no fish movement north of Seven Veil Falls

* Fish Consumption advice is provided by the Ministry of the Environment.

Erosion Study Findings

In the first few years after the completion of the Ogoki Diversion, in 1943, the additional water resulted in increased erosion along the Little Jackfish River valley. By the early 1950s, the rate of erosion dropped off and is now approaching a normal, natural minimum for this type and size of river. Erosion is a natural process that will continue to occur.



Summary of Potential Effects of Flow Pattern Changes Downstream of the Proposed Generating Station

If a new generating station is constructed it is expected that there will be a small, short term increase in erosion. Over the long term, erosion will be reduced primarily as a result of reducing the maximum water flow and velocity experienced by the river. It is predicted that there will be some period of adjustment to the patterns of erosion of the banks and bed of the river. Long term changes in the overall rate of erosion are expected to be minor.

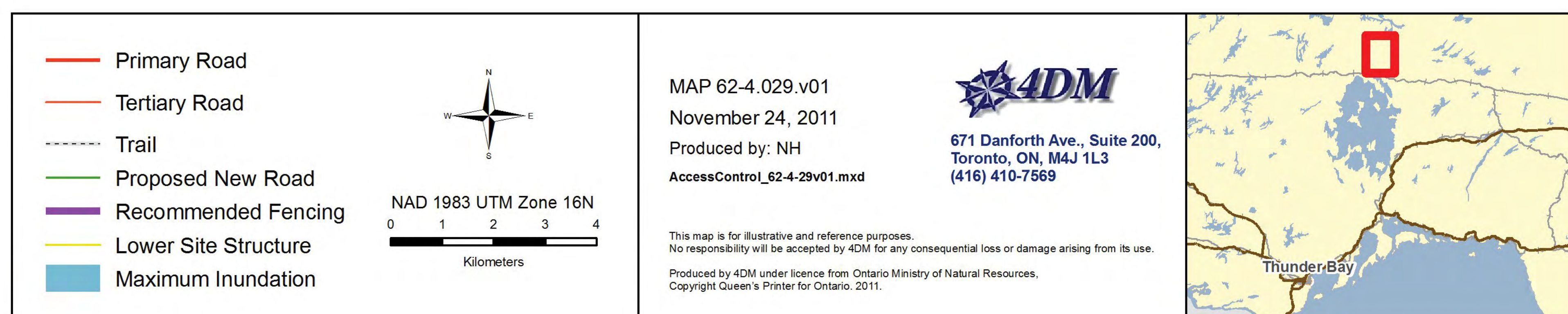
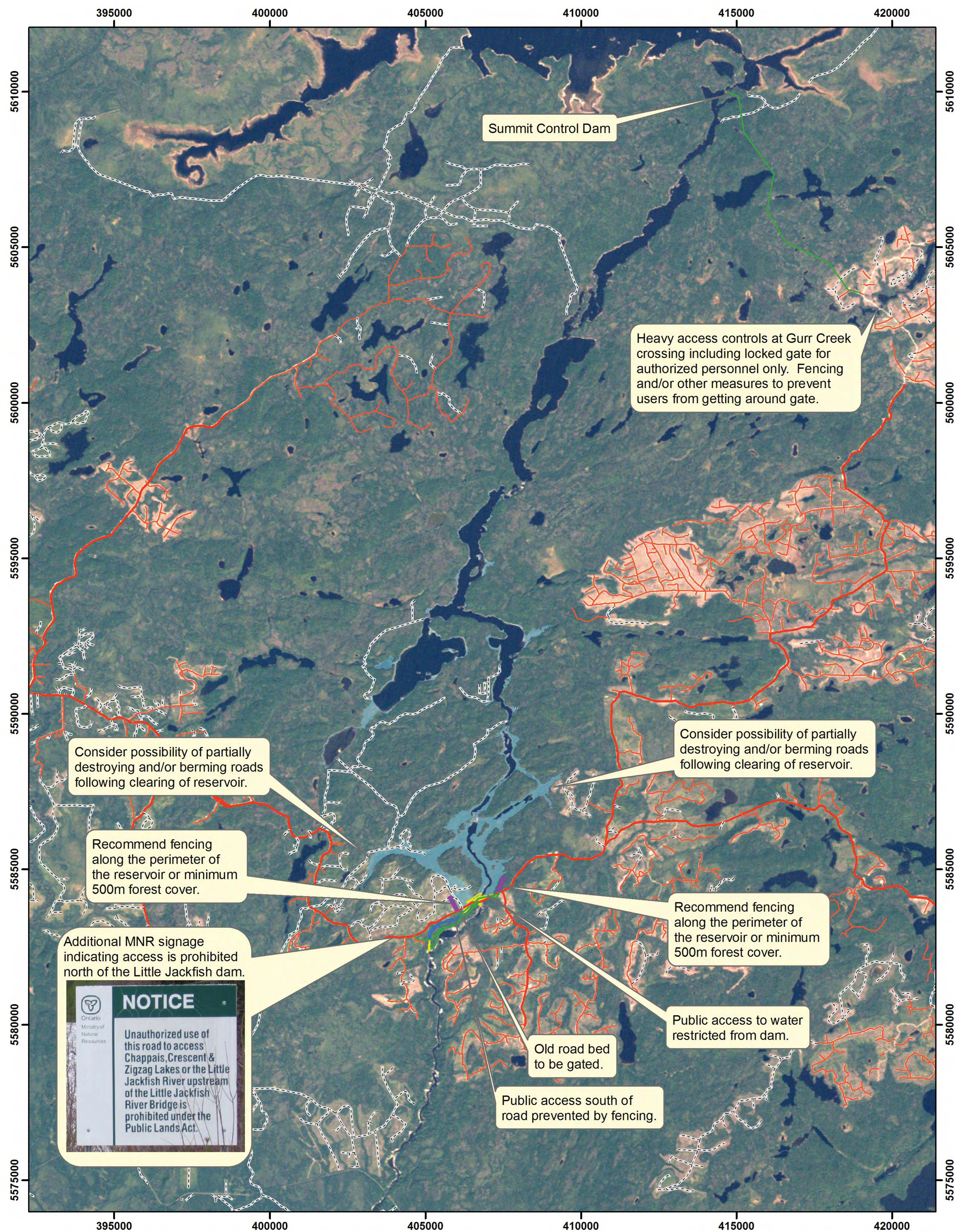
Factor	Current Condition	Proposed Operation of GS	Potential Impact on Erosion
Total amount of water/year	4,000,000,000 cubic metres (m ³)	No change	No impact
Maximum Flow	350 – 450 cubic metres per second (cms) most years	Reduced to average of 220 cms most years	Reduced erosion – Lower maximum flow and lower maximum water velocity would erode river banks less
Duration of Maximum Flow	Short duration observed typically during spring freshet	Longer duration observed typically through summer	Uncertain of short-term impacts to river bank undercutting, uplift and support. Long-term impacts expected to be minor
Minimum Flow	5 cms	Increased to 35 cms	Insignificant - higher minimum flow would have minimal impact on river bank stability and erosion
Flow Changes	Flow changes occur slowly over weeks	Flow changes occur daily. Potential to change from 35 to 220 cms over the period of a few hours.	Small yet short term increase in erosion as the river adjusts to new flow pattern. Minor reduced erosion on long term basis
Erosion observed above the water line	Freeze thaw action Rain and snow run off Water table depth Seepage and piping that reduces slope stability	Reduced spring water flows No change No change No change	Reduced – flows too low to move material No impact No impact No impact
Sediment carried to Ombabika Bay	118,000 m ³ per year (typical for a mature river in this area)	Reduced maximum water flow and velocity	New dam would block sediment from upstream: lower maximum velocity in river will result in less sediment carried downstream

Armstrong and Local Socio-Economic Impacts

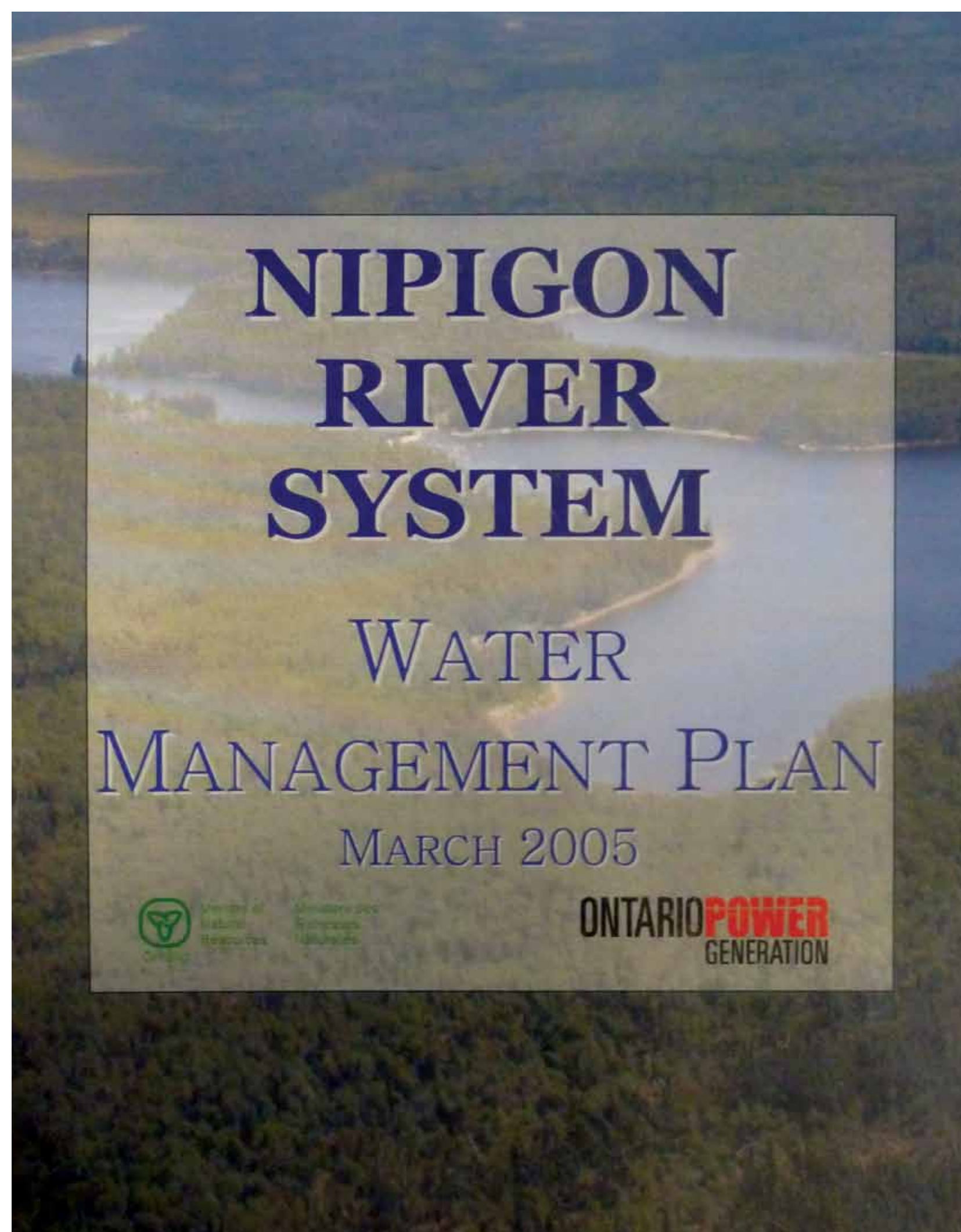
- This Project is compatible with the existing land-use and resource planning direction.
- Potential direct effects of the transportation route and construction site would impact the community of Armstrong and Whitesand First Nation. Discussions to address concerns are underway.
- Potential impact on the forest industry is considered negligible. Harvesting opportunities would occur for local contractors and forest resources allocated to identified licence/directive holders.
- Mining companies or opportunities would not be negatively impacted: the economic viability of mining opportunities would be advanced by improved access and local power supply.
- Very little new permanent road construction is required, but upgrading of the Pikitigushi/Jackfish Road would be necessary.
- Negative effects on the remote tourism operation on Zigzag Lake, north of GS site. Discussions with impacted outfitter are underway.
- Current fishing site at the location of the proposed GS on the Little Jackfish River will need to be closed owing to public safety concerns (risk of drowning). Discussions to create an alternative fishing site will occur with current and interested users as well as the Ministry of Natural Resources.
- Negligible impact on other public uses such as canoeing/kayaking as these activities occur infrequently on the system.



Proposed Access Protection Strategy



Proposed Operating Plan for the Generating Station



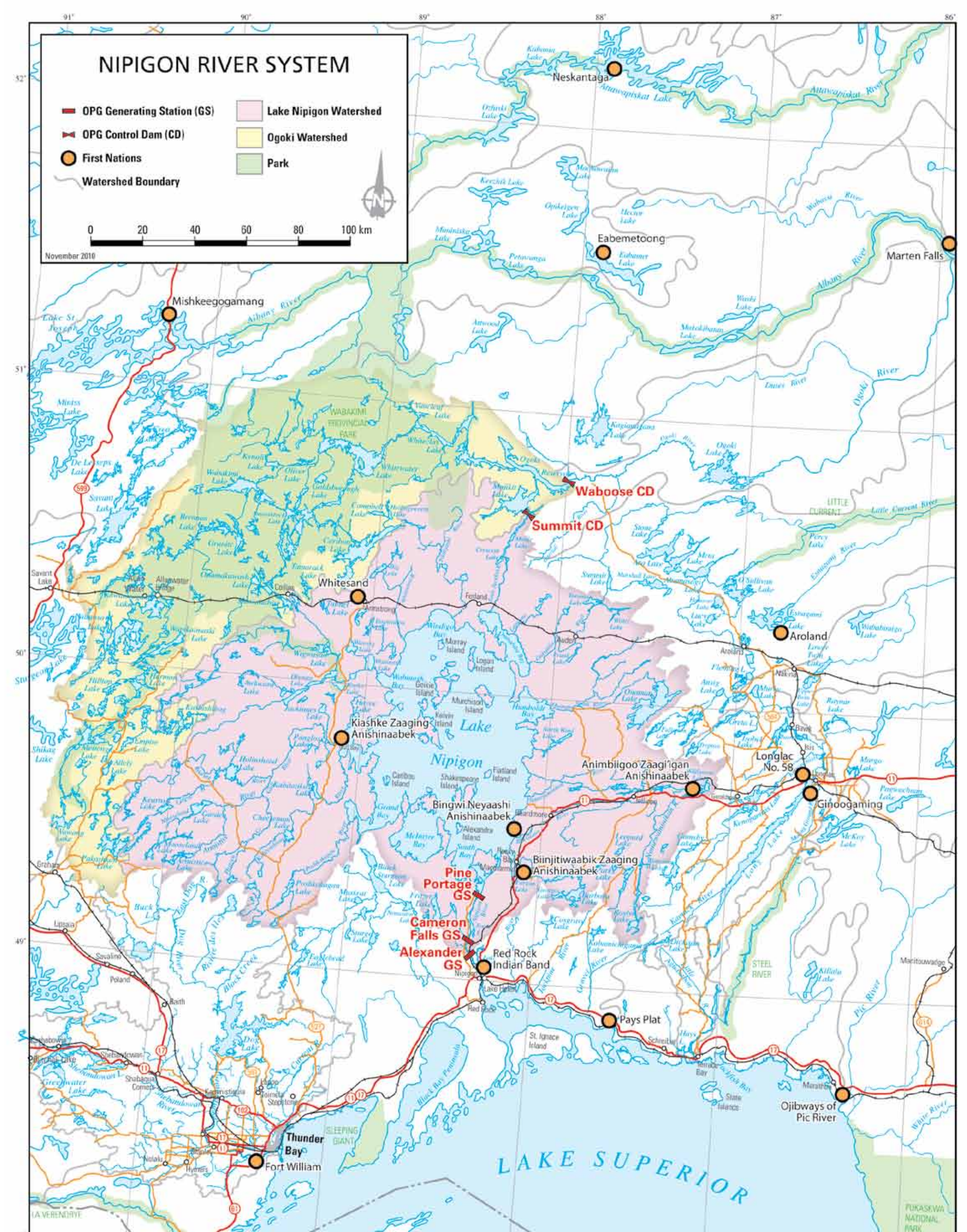
The new Little Jackfish facilities are located within the Nipigon River System for which there is an existing Water Management Plan (WMP).

The Operating Plan has been developed with consideration and input from Aboriginal communities, the WMP Planning Team, Nipigon Watershed Advisory Committee, Ministry of Natural Resources (MNR) and the public.

The WMP describes how all facilities within the system are to be operated in terms of **water levels and flows**.

The Operating Plan and its potential impacts will be included in the Environmental Report.

An amendment to the WMP, to incorporate the proposed Operating Plan, will be submitted after the generating station is constructed and put in-service.



Existing Flows in the Ogoki System and down Little Jackfish River



Summit Control Dam Outlet
to the Little Jackfish River



Waboose Control Dam Outlet
to the Ogoki River

- Inflow to Ogoki Reservoir is natural and depends on the quantity of precipitation.
- Reservoir has two outlets: Waboose Control Dam and Summit Control Dam.
- The Nipigon River Water Management Plan requires that:
 - Waboose Control Dam is normally closed with minimum flow to maintain fish habitat below the dam; and
 - Summit Control Dam operates "wide open" with all stoplogs removed and at its maximum flow rate at all times.
- Flow from Ogoki Reservoir is directed down the Little Jackfish River via Summit Control Dam to Lake Nipigon.
- During periods of elevated water level on Lake Nipigon, flow down the Little Jackfish River is reduced and water flow re-directed through Waboose Control Dam.
- Flow changes at Summit Control Dam are currently done manually by removing/replacing logs.
- Waboose and Summit Control Dams are accessible only by flying in.



Little Jackfish River

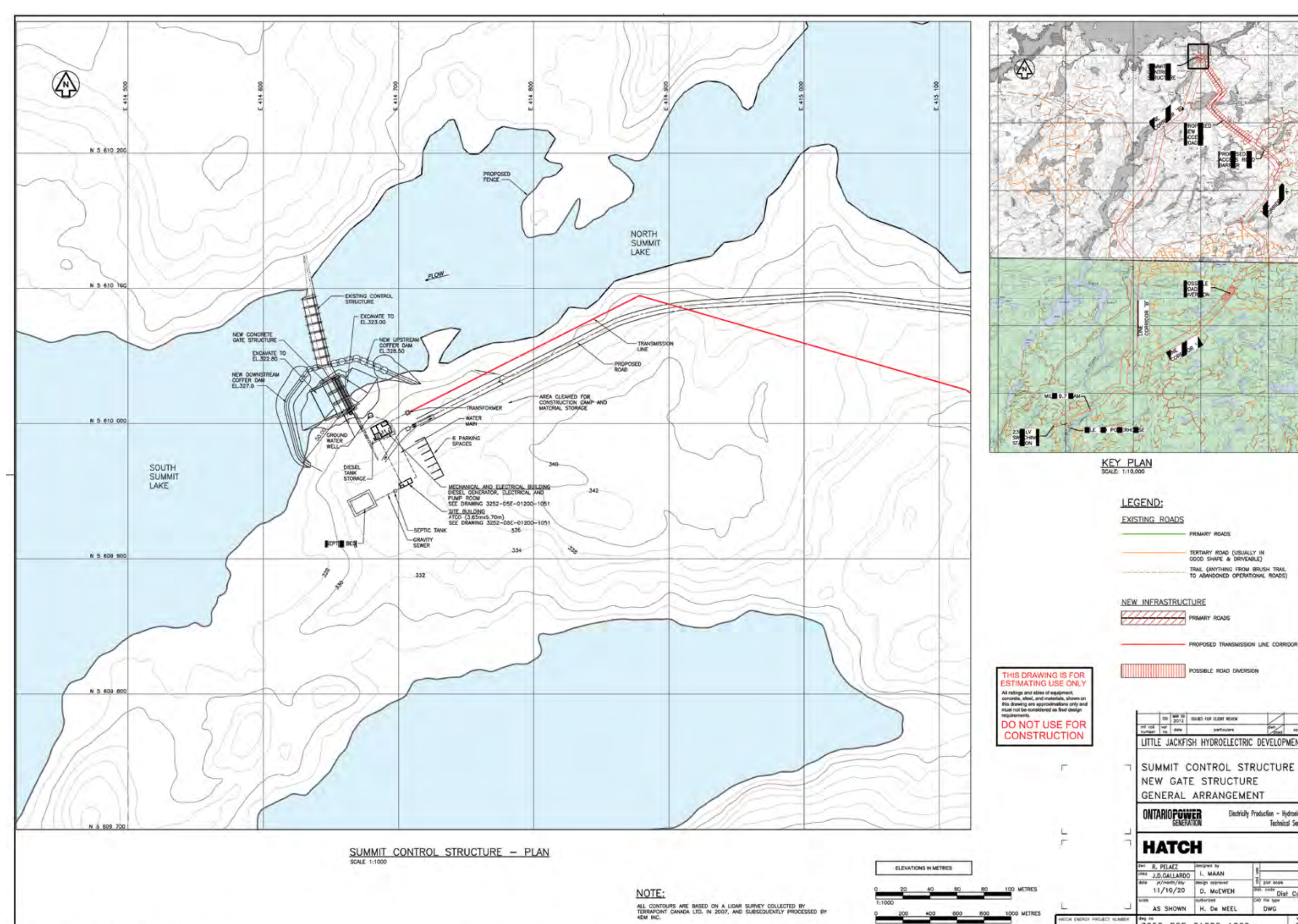
HYDROELECTRIC PROJECT

What remains the same in the Ogoki System?

- The existing minimum flow at Waboose Control Dam and capacity to manipulate flow when required.
- The water level of the Ogoki Reservoir will remain within existing normal elevation ranges, as defined in the Water Management Plan.
- During periods of elevated water level on Lake Nipigon, flow down Little Jackfish River may still be reduced and water flow re-directed through Waboose Control Dam.
- The overall quantity of flow to Lake Nipigon.
- The maximum design flow capacity of 220 cubic metres/second (cms) from the proposed GS is within the normal historical flow range of the Little Jackfish River of 30 to 360 cms.

What are the Proposed Changes to the Ogoki System?

- Summit Control Dam will remain in place with similar flow constraints. However, the ability to remotely reduce flow below "Summit Control Dam wide open" and store water in Ogoki Reservoir will be made available.
- Automated flow control allows for instant, routine and accurate adjustment of flows.
- Automated flow control allows for storage and "seasonal time shifting" mode of operation rather than maintaining Summit Control Dam at maximum capacity or "wide open" at all times.
- Seasonal time-shifting means storing water in low electrical demand seasons (spring/fall) and using it in high electrical demand seasons (summer/winter).



Proposed modifications to Summit Control Dam with new gates

Spring period flow considerations

- Flows greater than 100 cubic metres/second (cms) start to become a barrier to upstream fish movement from Lake Nipigon. For current and historical operations, flows are often above this range during typical springs. The main flow constraint is at the chute beneath the CNR bridge.
- The intent of the proposed spring flow regime is to make the Little Jackfish River more accessible for spring spawning fish (e.g., walleye and suckers). This will maintain or expand capacity of Little Jackfish River to contribute to Lake Nipigon fish populations.
- In the spring, flows from Summit Control Dam will be targeted to a range of 35 to 100 cms to allow fish access upstream to spawning areas in the vicinity of the GS.
- Reduced and more stable flows through Summit Control Dam and the GS will allow water storage within the Ogoki Reservoir. This stored water will be used in the summer to benefit the electricity system through seasonal time shifting.
- Studies were carried out in the by-pass reach to determine the effect of flows on availability of fish habitat. Based on these studies, a stable flow of at least 15 cms into the by-pass reach has been determined to provide the appropriate habitat conditions for spawning, egg development and larval fish drift downstream.
- During spawning season, flow throughout the system will be kept as stable as possible to allow for spawning and development of fish.



In Stream Flow Study



CNR Chute at High Flow



CNR Chute at Low Flow

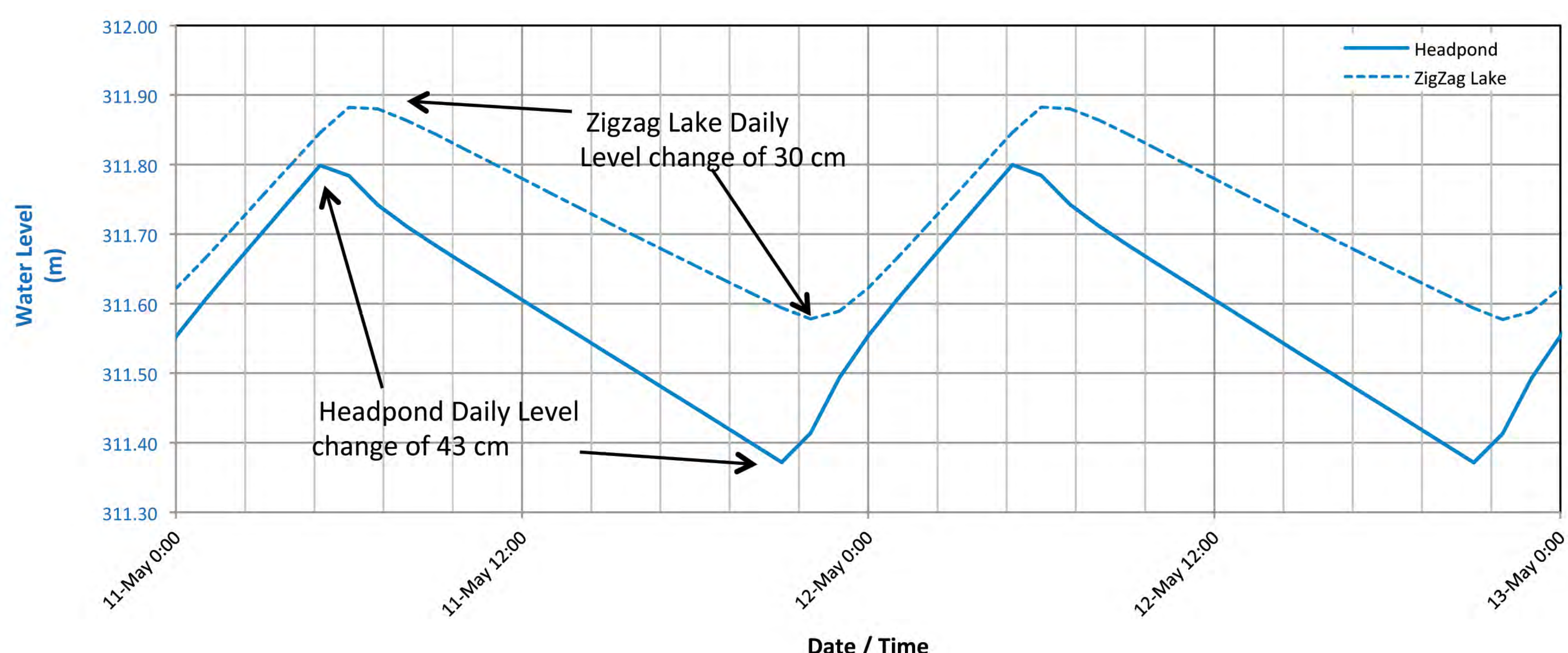


By-pass reach between
dam and powerhouse

Flows outside of the spring period

- The minimum flow in the river downstream of the GS is proposed as 35 cubic metres/second (cms). There will be periods when the natural flow conditions in the river may be less than 35 cms due to flow limitations at Summit Control Dam. Based on study results, the minimum flow for the by-pass reach is proposed as 5 cms.
- Daily time shifting operation is proposed for the GS, where flow would be increased during the high demand periods of the day, and reduced during the low demand periods of the day.
- During periods when daily time shifting is occurring, the lower range of flow for the river is expected to be 50 to 60 cms. This range is consistent with the spring flow targets and the typical flows historically experienced pre-freshet. Daily time shifting flows are expected to range up to approximately 200 cms as a normal high flow.
- Daily water level changes of up to 30 cm may occur within Zigzag Lake, and up to 40 cm within the head pond above the dam. The normal upper water level will be equivalent to the current high water level of Zigzag Lake.

Proposed water level and flow comparisons at different locations over two days



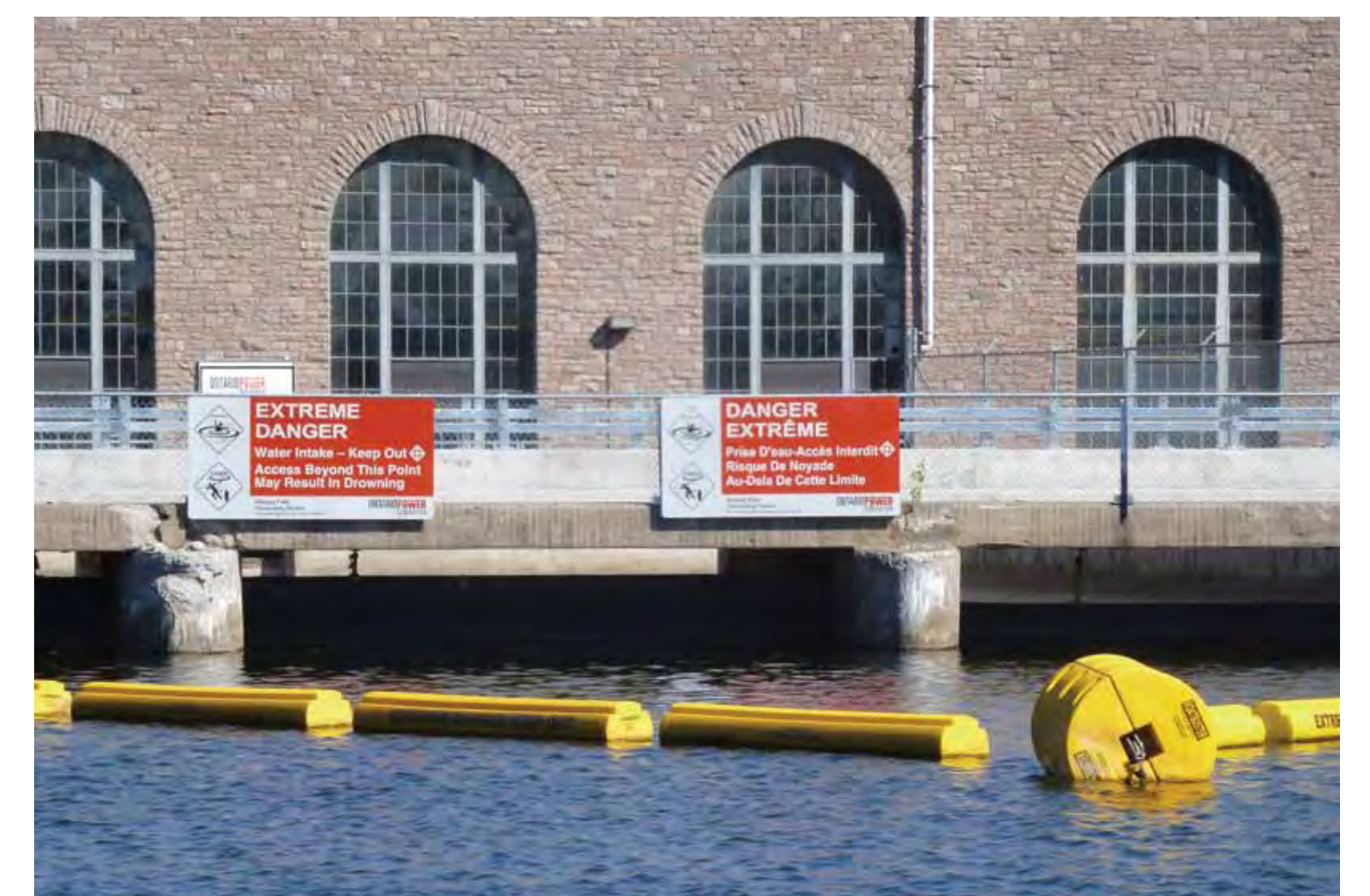
Summary of Key Construction Commitments

Area of Concern	Summary of Mitigation, Compensation or Management Commitments
Terrestrial Effects <i>Wildlife and wildlife habitat</i>	<ul style="list-style-type: none"> • Worker, hunting and traffic restrictions near site to reduce disturbances to wildlife. • Forest harvest resources and contracting directed to licensed/directive holders. • Adhere to Vegetation Clearing Plan and Canadian Wildlife Service Guidelines during bird breeding season. • Develop a Site Rehabilitation Plan for disturbed areas following construction. • Obtain environmental permits and approvals prior to construction and conditions followed. • Follow Waste Management Plan and Explosive Management Plan.
Aquatic Effects <i>Fish, fish habitat, river ecosystem, erosion</i>	<ul style="list-style-type: none"> • Obtain environmental permits and approvals prior to construction and conditions followed. • Creation of new fish habitat to be developed, in consultation with Department of Fisheries and Oceans and Ministry of Natural Resources as part of Overall Fish Habitat Mitigation and Compensation Plan. • Adhere to In-water Construction Plan to avoid fish spawning and incubation periods. • Physical works in by-pass reach to avoid fish stranding and ensure brook trout access to spawning habitat in Major Creek. • At water crossings, vegetated buffers will remain with only clearing of large trees that interfere with transmission lines. This would minimize erosion and sedimentation and assist in maintenance of water temperatures. • Harvesting in winter to limit impact of soil disturbance and erosion. • Follow Erosion and Sedimentation Control Plan and Spill Prevention and Management Plan. • Cut and remove vegetation from the flood zone to reduce methylmercury production.
Cultural Heritage Effects	<ul style="list-style-type: none"> • Stage 2 Archaeological Assessment required for transmission corridor on approximately 80 areas of high archaeological potential, such as water crossings. • Work to occur pre-construction.
Local Social-Economic Effects <i>Noise, dust, pressure on services in Armstrong</i>	<ul style="list-style-type: none"> • Upgrading of the Pikitigushi/Jackfish Road and bridges between Armstrong and the river. • Minimal new road construction required. • Address community of Armstrong concerns about transportation and other construction pressures and nuisances. • Follow Emergency Preparedness and Response Plan.



Summary of Key Operational Commitments

Area of Concern	Summary of Mitigation, Compensation or Management Commitments
Little Jackfish River System	<ul style="list-style-type: none"> Implement an Aquatics Monitoring Program to confirm that healthy and sustainable population of fish is maintained upstream and downstream of the proposed dam. Implement Monitoring Program for all flow and level commitments. Implement Post-construction Monitoring and Communication Program about fish mercury levels and consumption advice.
Fish Entrainment	<ul style="list-style-type: none"> Use of Kaplan turbines which result in less fish injury/mortality than other commercially available turbines. Scouring of the bottom of the intake to discourage fish use of this area.
Loss of Fish Habitat	<ul style="list-style-type: none"> To compensate for the barrier to upstream fish migration caused by the dam, operation with reduced flows in the spring, where feasible, will allow fish to overcome other downstream barriers and gain access to spawning areas in river near GS. Operations to ensure sufficient flows in the by-pass reach to allow for a viable connection for brook trout between the river and Major Creek. Fish habitat will be created in the new head pond. Overall Fish Habitat Mitigation and Compensation Plan to be developed in consultation with Department of Fisheries and Oceans.
Management of Accidents and Malfunctions	<ul style="list-style-type: none"> Ensure appropriate implementation of Emergency Preparedness and Response Plan. Ensure adequate protection and controls designed and operational in the event of technical failures, large storm events or forest fires. Ensure back-up systems in place for redundancy and safety to similar standards as other facilities.
Local Social Economic Effects	<ul style="list-style-type: none"> Address negative effects on remote tourism operation on Zigzag Lake with impacted outfitter. Implement Access Protection Strategy. Address request to create new access to an alternative fishing site on the river through discussion with river users and Ministry of Natural Resources.
Environmental Health and Safety	<ul style="list-style-type: none"> Develop and maintain ongoing Environmental Management Program for new facilities. Develop and maintain Health and Safety Program for new facilities.
Dam Safety	<ul style="list-style-type: none"> Develop and maintain Dam Safety Program for new facilities. Public Safety Risk Assessment of the proposed facilities to identify risks and identify and implement specific measures to protect the public, for example, booms, barriers and warning signs.
Woodland Caribou	<ul style="list-style-type: none"> Additional ways to mitigate and compensate for the impact of the transmission corridor on woodland caribou are being discussed with Ministry of Natural Resources.
Transmission Corridor Management	<ul style="list-style-type: none"> Implement Vegetation Control Plan.



We Value your Opinion at this Open House



Shawn Bremner, Project Engineer
Heather Brown, Sr. Environmental Scientist

- Now is the time to ask questions.
- Consultation has been a key component of the environmental assessment process; it continues to provide you with the opportunity to contribute and assist in the decisions related to the Project.
- We appreciate your time and value your opinions.
- Thank you for participating in our consultation process.
- These findings will be used to provide you with a safe, reliable, economic and renewable source of energy.