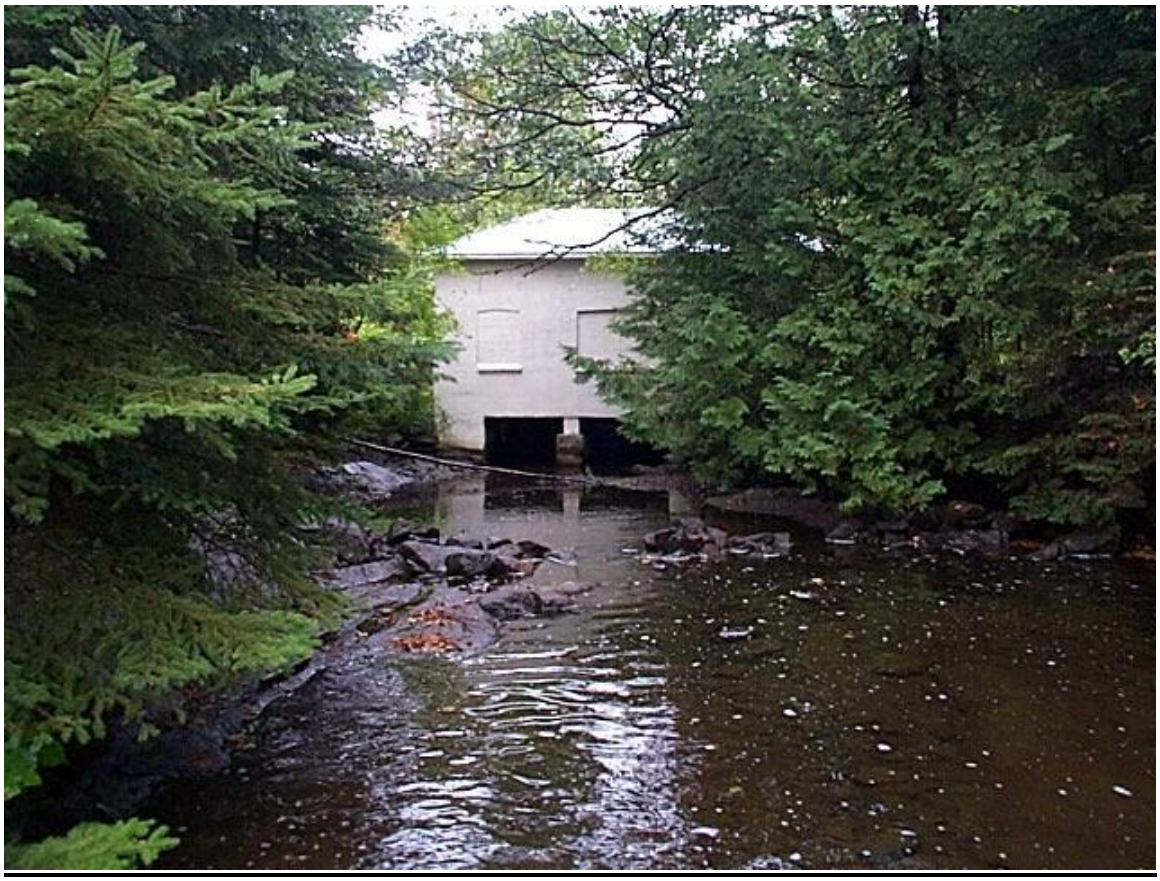
Water Management Plan

For Waterpower

Drag Lake Generating Station



March 2005

WATER MANAGEMENT PLAN FOR WATERPOWER

for the

Drag Lake Generating Station

on the Drag River

OMNR Bancroft District, Southern Region
Algonquin Power Fund "Canada" Incorporated

for the 10-year period April 1, 2005 to March 31, 2015

In submitting this plan, I declare that this water management plan for waterpower has been prepared in accordance with the *Ontario Ministry of Natural Resources, Water Management Planning Guidelines for Waterpower,* as approved by the Minister of Natural Resources on May 14, 2002.

_____

David Kerr, Principal, Algonquin Power Fund "Canada" Incorporated Date
I have authority to bind the corporation.

I certify that this water management plan has been prepared in accordance with the *Ontario Ministry of Natural Resources, Water Management Planning Guidelines for Waterpower,* as approved by the Minister of Natural Resources on May 14, 2002, and that direction from other sources, relevant policies and other obligations have been considered. I recommend this plan be approved for implementation.

_____

Monique Rolf von den Baumen-Clark, District Manager, Bancroft District Date
Ministry of Natural Resources

Approved by: _____

Ron Running, Regional Director, Southern Region
Ministry of Natural Resources

In 1994, MNR finalized its Statement of Environmental Values (SEV) under the Environmental Bill of Rights. The SEV is a document that describes how the purposes of the EBR are to be considered whenever decisions that might significantly affect the environment are made in the ministry. During the development of this water management plan, the ministry has considered its SEV.

This water management plan (WMP) sets out legally enforceable provisions for the management of flows and levels on this river within the values and conditions identified in the WMP.

In instances where, due to emergency energy shortages, the Independent Electricity System Operator (IESO) requests that owners of the waterpower facilities and associated water control structures seek relief from certain provisions of this WMP, the Ministry of Natural Resources (MNR) will consider those requests expeditiously and, after consultation with the IESO, may allow short-term relief from certain provisions.

The mandatory provisions of this WMP will be waived, as appropriate, when the dam owners (which may include other dam owners, such as MNR) are requested to do so by a police service or other emergency measures organization.

This plan does not authorize any other activity, work or undertaking in water or for the use of water, or imply that existing dams(s) meet with safe design, operation, maintenance, inspection, monitoring and emergency preparedness to provide for the protection of persons and property under the *Lakes and Rivers Improvement Act*. Approval of this WMP does not relieve the dam owners from their responsibility to comply with any other applicable legislation. For the purposes of this plan, an operational plan means a plan for the management of flows and levels.

Approval of this plan does not grant a dam owner the right to flood Crown land or the land of any other person without first obtaining the Crown's or that person's consent, nor does it authorize any infringement of the rights of the Crown or of any other person.

Table of Contents

1.0 Introduction

1.1 Plan Goal and Principles

It is the intent of this Water Management Plan (WMP) to follow the goals and principles set out in the *Ontario Ministry of Natural Resources (OMNR), Water Management Planning Guidelines for Waterpower (2002).*

The goal of water management planning is to contribute to the environmental, social and economic well-being of the people of Ontario through the sustainable development of waterpower resources and to manage these resources in an ecologically sustainable way for the benefit of present and future generations.

The following principles will guide planning through the preparation, review, approval and implementation of a WMP.

- Maximum net benefit to society
- Riverine ecosystem sustainability
- Planning based on best available information
- Thorough assessment of options
- Adaptive management
- Timely implementation of study findings
- Aboriginal and treaty rights
- Public participation

A more detailed description of these principles is available in the *OMNR, Water Management Planning Guidelines for Waterpower (2002*) on page 13.

1.2 Terms of Reference for Water Management Planning

This WMP has been prepared according to Terms of Reference for the Drag Lake Generating Station included in the Scoping Report for this facility (Appendix B).

1.3 Water Management Plan Objectives

The objectives of the WMP for the Drag Lake Generating Station are to:

a) Review, document and understand the hydro facility operations relative to environmental, social and economic benefits;
b) Establish the level of control that the facility exercises over levels and flows;
c) Determine the zone of influence of the hydropower facility;
d) Document resource values and environmental, social and economic issues within the zone of influence of the hydropower facility;
e) Establish whether a change in hydropower operation (water levels and discharge flows) would have a net environmental, social and economic benefit;
f) Fulfill the legislative requirements of Section 23(1.1) of the *Lakes and Rivers Improvement Act*; and
g) Be consistent with the goals and principles as outlined in section 4.0 of the *OMNR, Water Management Planning Guidelines for Waterpower (2002*).

2.0 Physical and Biological Description

The Drag Lake Generating Facility and Drag Lake Dam are located in the Bancroft District of the Ministry of Natural Resources, on the Drag River, east of the village of Haliburton and west of Drag Lake. The facility is located on private lands lot 23 concession VII of the Dysart geographical township. The original generating station supplied electricity to the Village of Haliburton and prior to the plant's rehabilitation in 1991-92 it was supplying electricity to some residences and a lumber yard.

Drag Lake is located in the upper half of the Drag River watershed. The Drag River watershed stretches from the headwater drainage area of Drag Lake to the river's confluence with the Burnt River near Gelert (see Appendix A). This watershed forms part of the Trent River watershed which flows into Lake Ontario. The watershed covers approximately 304 square kilometres. The portion of the watershed above the Drag Lake Dam has a drainage area of approximately 121 square kilometres. The Trent River watershed supplies water to the Trent-Severn Waterway (TSW). The Trent-Severn Waterway is an interconnected series of lakes and river channels that provides a navigable water link between Lake Ontario and Georgian Bay.

The Drag River, above Head Lake and up to the dam at Emmerson Lumber in Haliburton, contains spawning habitat for walleye and muskellunge. Upstream to the Drag Lake Dam, the river contains centrarchidae fishes and in 1999 was stocked with rainbow trout. Drag Lake is primarily a lake trout fishery but is also known to contain the following species: lake herring, smallmouth bass, rock bass, white sucker and pumpkinseed.

2.1 Hydropower Facility Zone of Influence

The "zone of influence" refers to the portion of the watershed that may experience changes in water levels and flows as a result of the hydro facility operation.

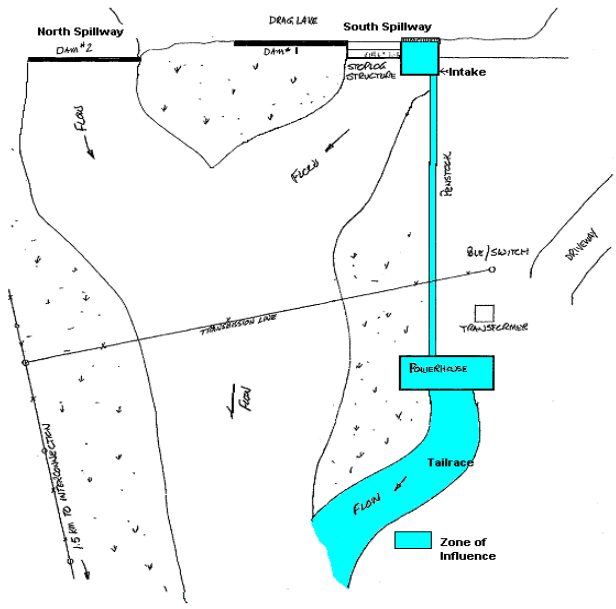


Figure 1 –Site Layout and Zone of Influence

Headpond water levels are not manipulated for hydro power production. Upstream levels are maintained within the predetermined seasonal levels as managed by the TSW. TSW also determines the amount of flow that is subsequently available for waterpower production as per a lease agreement between Algonquin Power and TSW. Since the operation of the Drag Lake Waterpower Facility does not regulate the upstream water levels the upstream zone of influence (Figure 1) is immediately upstream of the hydro facility. The downstream zone of influence (Figure 1) extends to where the outlet channel meets the Drag River.

2.2 Resource Values and Issues

During the scoping phase of the planning process, the steering committee identified values associated with the "Zone of Influence" that have been included in the Scoping Report (see Appendix B).

No issues were identified with the operation of this facility as it pertains to flows and levels.

3.0 Waterpower Facility and Other Water Control Structures

3.1 Brief Description of Waterpower Facility

The generating facility consists of a 120 meter long 1.2 meter diameter penstock, an intake on the TSW dam, powerhouse building and a 25 meter tailrace. The maximum head is 13.4 meters. The intake is a concrete structure equipped with gains, actuator valve, stop-logs and a steel trashrack. Adjacent to the intake is a concrete overflow weir with stop-log gains. The powerhouse is a concrete building, originally constructed in 1925 as the Haliburton Municipal Power Plant, and houses one Barber-camel back double runner Francis turbine and a Westinghouse generator with a capacity of 220 kW. The turbine has wicket gates which can close automatically preventing water flow to the runner blades. The facility has a maximum capability of 2.2 cms.

3.2 Brief Description of the Drag Lake Dam

The Drag Lake Dam is owned by the federal government and is operated by the Trent-Severn Waterway an agency of Environment Canada. The dam consists of two dams separated by a small island. The south dam (Figure 2) is 5.8 metres in height, 32.9 metres in length and has a gain width of 3.66 metres. The north dam (Figure 3) is 4.6 metres high, 24.4 metres long and has a gain width of 2.44 metres. The dams are stop-log structures that are manually operated. The maximum operating range of the dam is 2.29 meters. The power plant intake is on the south dam and is 1.2 metres in diameter. Operation of the water power facility is permitted and governed by a lease agreement that provides Algonquin Power with the permission to maintain and operate the intake on the Drag Lake Dam.

Figure 2 – South Dam

Figure 3 – North Dam

4.0 Current Operations

The Trent-Severn Waterway (TSW) determines the water releases through the TSW controlled structure upstream of the Drag Lake Generating Station to meet the management objectives of the waterway. The TSW monitors water levels in Drag Lake and advises Algonquin Power operations of the amount of flow to be released which can be subsequently diverted into the penstock for power production rather than the water being passed through the sluiceway by TSW. The TSW provides direction to Algonquin Power operations daily or weekly depending upon flow and lake level conditions. The waterpower generating installation has no influence on setting flows in the Drag River or the water level in Drag Lake.

Due to conditions of the previously mentioned lease, the operation of the generating station is dependent upon the discretion and direction of TSW in meeting the management objectives of the Waterway. Algonquin Power is contacted by TSW and informed when and how much flow is available for use by the waterpower facility. TSW provides Algonquin Power with instructions for utilizing the inflow and the Algonquin Power Operator must travel to the facility and manually start the plant which opens the wicket gates to allow flow into the turbine.

The maximum capacity of the plant is 2.2 cms therefore flows in excess of 2.2 cms would be conveyed by TSW through stoplog manipulation in the spillway. Flows generally are approximately half of the maximum capacity of the generating unit. During low flow conditions the operator can adjust water intake or shut down the plant as per notification or direction of the TSW. Should Algonquin Power not utilize the inflow or must turn the plant off, TSW is informed so that they can adjust the spillway stoplogs on the dam to pass the required flow. The wicket gates will close automatically in case the connection with the Hydro One grid is disconnected and subsequently TSW is informed of the closure. Algonquin Power does not manipulate the intake on the dam unless there is a need to de-water the generating unit for maintenance or to rake the trashrack. Algonquin Power does not manipulate either of the spillway's stoplogs.

4.1 Maintenance as it is Related to Operations

Minor maintenance is performed with periodic shut downs. Shutdowns are achieved through the closure of the intake to the turbine.

5.0 Operating Plan

The Drag Lake generating facility will continue to generate power from flows determined by the Trent-Severn Waterway as per conditions of the lease agreement with the Federal Government.

6.0 Plan Enforcement and Compliance

The generating facility's operations are governed by a lease agreement with the Federal Government. As per the lease agreement, TSW determines water levels and determines the flows which can be subsequently utilized for power production. Algonquin Power does not have control of flows and levels therefore there are no requirements for reporting flows and levels by the facility operator.

Trent-Severn Waterway records water levels on Drag Lake and determines flows and water levels for the purpose of managing the waterway. Algonquin Power does not regulate upstream water levels or downstream flows thus there is no requirement for a rule curve or additional recording or reporting requirements. However, if the lease agreement with the Federal Government is modified or cancelled the Water Management Plan may need to be amended.

7.0 Provisions for Plan Reviews, Amendments, and Plan Renewals

This plan has a term of ten years, from April 1st, 2005 to March 31st, 2015. The first plan review will commence no later than March, 2013. Subsequent reviews of the plan will be carried out as required and as determined by the MNR and the waterpower producer. The review will involve public consultation through the ***Environmental Bill of Rights*** Registry (EBR) postings where required. An unscheduled plan review may be required at any time if an issue develops that justifies a comprehensive reassessment of the whole plan.

Amendments to the WMP can also be made during the term of the plan provided the outcomes remain consistent with the goals and objectives of the WMP.

Three categories of amendments are provided:

- Administrative
- Minor
- Major

The amendment process involves:

a) Submission of a request for an amendment.
b) Review of the request by the MNR District Manager, with advice from the Steering Committee.
c) Acceptance or denial of the request.
d) If acceptance, assignment of a category to the amendment.
e) Completion of all applicable planning requirements, including public consultation.
f) Record-keeping requirements.

7.1 Amendment Request

Any request must be accompanied by sufficient information to allow the MNR Regional Director to determine whether the proposed amendment should proceed, and whether the amendment should be treated as administrative, minor, or major. The amendment request must contain the following information:

- A brief description of the proposed amendment.
- The rationale for the proposed amendment and a discussion of its significance.
- If new operations are proposed:
    - A brief description of the proposed operations and a description of the previously approved operations in the water management plan which will be changed by the proposed amendment.

- An outline of the applicable planning requirements for the proposed operations, including public consultation, based on the planning requirements for similar operations in a water management plan.

7.2 Review of Amendment Request and Categorization of Amendments

The MNR Regional Director is responsible for determining whether an amendment should proceed, and for categorizing the amendment as administrative, minor, or major. In making this determination, the Regional Director will assess the appropriate extent of public consultation and MNR review and approval necessary.

The Regional Director considers the following factors in determining whether to grant the request for an amendment, and in determining the appropriate category for the amendment:

- Whether there are legitimate time constraints which must be met for reasons of public safety, biological or industrial necessity, or public convenience and necessity.

- Whether there has been previous notification that the requested amendment will be required, and the degree to which planning and public consultation has taken place previously (e.g. decisions deferred in the water management plan; amendments required after public consultation in other planning processes).

- The adequacy of the information concerning the resource features, land uses and values potentially affected and the anticipated potential effects of the requested operations.

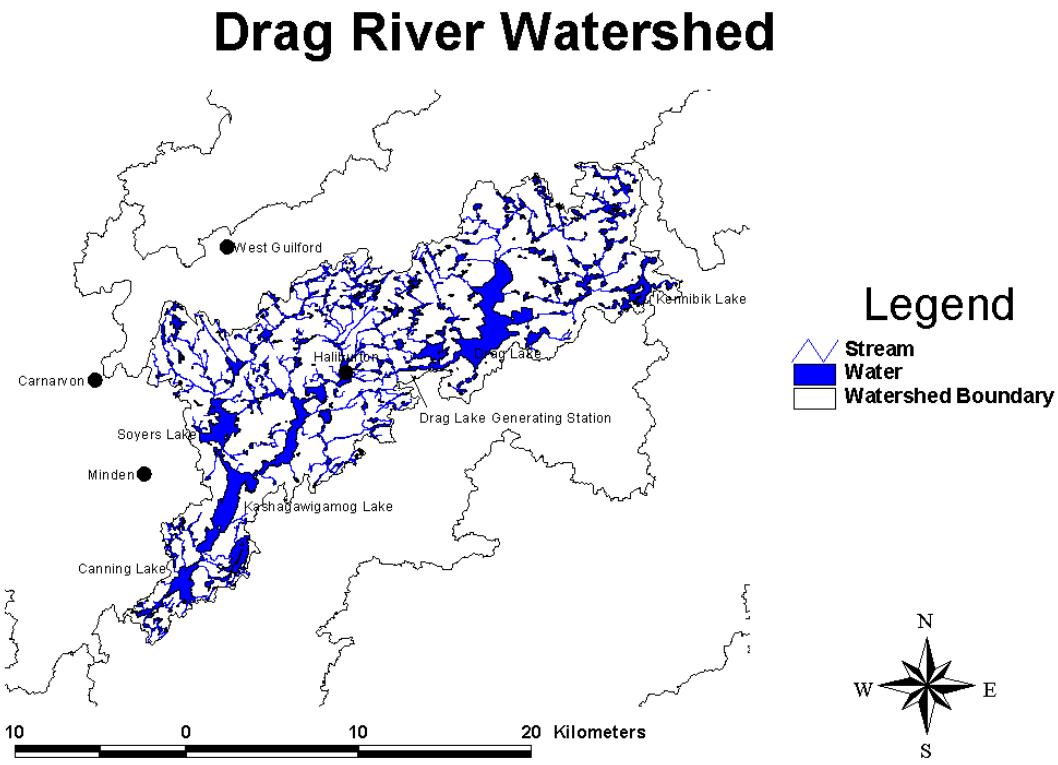
- The number of previous requests for similar amendments.

The decision on the amendment request, and the appropriate category of amendment, will normally be made within 30 days of receipt of the request. The MNR Regional Director will prepare a written decision, and any disagreements with the categorization of the amendment, will be recorded in that written decision.

7.3 Amendment Records and Distribution

All approved amendments will form part of the approved water management plan. A copy of each approved amendment will be filed with the approved water management plan at the appropriate MNR district office immediately upon approval. A record of all amendment requests and all approved amendments will also be maintained.

Appendix A


Drag River Watershed
West Guilford
Kennibik Lake
Carnarvon
Drag Lake
Drag Lake Generating Station
Soyers Lake
Minden
Kashagawigamog Lake
Canning Lake
10 0 10 20 Kilometers
Legend
Stream
Water
Watershed Boundary
N
W
E
S

Appendix B

Water Management Planning Scoping Report

Drag Lake Waterpower Generating Station

Lot 23 Concession VII Dysart

Compiled by the Steering Committee

February 2005