

**ANDREWS POND CONTROL STRUCTURE  
ENVIRONMENTAL ASSESSMENT  
REGISTRATION**

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**TABLE OF CONTENTS**

The Undertaking ..... 1

Description of the Undertaking ..... 2

    1. Geographical Location ..... 2

    2. Physical Features ..... 2

    3. Construction ..... 4

    4. Operation ..... 5

    5. Occupation ..... 6

    6. Project Related Documents ..... 6

Approval of the Undertaking ..... 6

Schedule ..... 9

Funding ..... 9

**LIST OF APPENDICES**

Appendix A            AMEC Earth & Environmental Limited – Wetted Perimeter Assessment,  
                                 Shoal Harbour River

Appendix B            AMEC Earth & Environmental Limited – Freshwater Aquatic Habitat  
                                 Quantification – Andrews Pond

Appendix C            Proposed Access Route to Andrews Pond

Appendix D            Andrews Pond Pre-Construction Photos

Appendix E            Preliminary Design Drawings

**Name of The Undertaking:**

**Andrews Pond Water Control Structure**

**Proponent**

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**The Undertaking**

1. Funding has been approved under the Canada/Newfoundland Infrastructure Program for the Town of Clarenville to construct a new water treatment plant for its Shoal Harbour River water supply system.

The Town of Clarenville uses two water supply/treatment facilities to supply water to its residents. The Lower Shoal Harbour River system is currently operating at its maximum daily output, and as a result, in order to meet the future water demands of its residents, the capacity of the Shoal Harbour River water supply is to be upgraded. The existing intake for this water supply is located in the Shoal Harbour River just west of the Town of Shoal Harbour. Andrews Pond is located approximately 13km upstream of the intake and is an integral part of the water supply system. During the summer months, the flow in the Shoal Harbour River is substantially reduced and as a result, it is considered necessary to increase the capacity of Andrews Pond to supply the water. This can be achieved by constructing a containment and spill control structure at Andrews Pond.

The water control structure will be designed and constructed so as to allow for increased storage at Andrews pond and provide the Town of Clarenville with the ability to increase the flow of water into its water supply/treatment system during the low flow months of June, July and August. The increased amount of water during this period will ensure minimum fish flow requirements are being met as well as municipal water demands.

## **Description of the Undertaking**

### **1. Geographical Location**

The proposed water control structure is to be located at the outlet of Andrews Pond. Andrews Pond is located approximately 12 km northwest of the Town of Clarendville and is identified on the attached copy of NTS Map Sheet 2D/1.

Currently, access to the site is achieved by means of an existing gravel road which runs from the TCH south around Thorburn Lake, which is part of the old Newfoundland Railway. A forest access road is then used to get to within 500 m of the proposed site. A new access road will then have to be constructed to travel the last 500 m. The area is currently clear cut to within 100 m of the pond from logging operations, and as a result, a minimal number of trees will have to be removed to complete access.

### **2. Physical Features**

The water control structure will essentially consist of a concrete structure approximately 35 m long, 2 m high and 2 m wide. Incorporated in the structure will be two water control gates for release of water during times of low flow, a fish ladder to ensure that fish migration patterns are not disrupted, and an overflow spillway. An earth fill dam approximately 12 wide at the base and 5 meters wide at the crest will extend from the concrete control structure, southward along the shoreline for a distance of approximately 60 meters. Details can be seen on the attached preliminary design drawings in appendix A.

Various concepts were considered, taking account of location, constructability, and logistics. All concepts took advantage of a bedrock outcrop as the foundation for the concrete structures such as the overflow spillway, control gates and fishway. The remainder of the structure is an earthfill dyke, with foundation treatment to prevent seepage. In the initial concept, the new structure extended across the outflow of Andrews Pond just above a large pool, following the alignment of an old timber crib dam. The test pit locations on the plan view show the original alignment.

After review of the fish habitat surveys and information provided by local residents, the dam was moved upstream of the old timber crib structure to be clear of the large pool downstream of the outflow of Andrews Pond. This pool was identified as being in an area of Type I spawning habitat, and may be a holding/spawning area for rainbow trout. The current design has the earthfill structure extending directly across from the rock outcrop and its footprint is entirely over the lacustrine habitat (see attached report *Habitat Quantification of Andrews Pond, AMEC 2003*). This realignment therefore avoids potential important spawning habitat.

**ANDREWS POND CONTROL STRUCTURE  
ENVIRONMENTAL ASSESSMENT REGISTRATION**

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The outflow of the fishway and control gates was also placed at the most southerly end of the bedrock outcrop. This places the flows from the structure as close as possible to the original outflow of Andrews pond. The outflow channel from the fishway and gates will be constructed to ensure that the flows will enter the top part of the pool. Suitable spawning material can be placed on the bottom of the small channel that will be created between the fishway/gates and the pool to augment the existing pool.

The control structure will be designed and constructed so as to increase the water storage capacity of Andrews Pond, by raising the elevation of the pond to the present high water mark.

The fishway is shown schematically in the attached figures as a pool and weir design. Final details will be determined in consultation with DFO. The design incorporates removable stop logs with appropriate notches or holes to ensure adequate flow as required for fish passage. The stop logs will form the weir structures between the pools. Operators of the structure will have the ability to adjust the stop logs so that flow can be directed as required. The fishway will therefore have some flexibility in flow adjustment after construction.

The outflow of the fishway/gates will be constructed so that it may provide additional habitat as it enters the existing pool of the outflow stream. The downstream slope of the overflow weir will be surveyed during construction, and shaped and stabilized to prevent erosion and potential sedimentation during high flow events. Stabilization could include vegetating exposed areas with grasses to bind soil and reduce water velocity, placement of suitable rockfill to stabilize the slope, and contouring of the slope to ensure that channels of excess velocity are not created which could erode the existing streambed.

Amec Earth & Environmental Limited have studied the area with respect to the existing physical and biological environment and the effects of construction on the same. The results of which can be seen in the attached report; "Freshwater Aquatic Habitat Quantification".

### **3. Construction**

Construction of the water control structure would begin in mid-July and conclude by mid-September, 2003 as these are the months of lowest flow on the river. This schedule hinges on the necessary approvals from the various regulatory bodies such as the Department of Environment, DFO and the Department of Municipal & Provincial Affairs.

The first step in construction would be to gain access to the site by first upgrading the existing forest access road followed by the construction of approximately 500 m of new access road to the outlet of Andrews Pond. The 500 meters of new access road will follow an existing walking path which extends from the end of the existing access road to

**ANDREWS POND CONTROL STRUCTURE  
ENVIRONMENTAL ASSESSMENT REGISTRATION**

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the outlet of Andrews Pond. Once access to the site has been achieved, construction of the control structure could begin. The construction of the structure would be done as quickly as possible so as to ensure minimal disturbance to the river and surrounding environment. It is estimated that construction of the control structure will take four weeks.

The method of construction for the control structure generally consists of the construction of a sand bag coffer dam, temporary redirection of the river around the construction area, construction of the control structure, removal of the coffer dam and re-establishment of the natural flow of the river.

As with any construction project, there are always potential sources of pollutants to the environment. The two main sources of pollutants for this project are possible siltation of the river and spillage and/or leakage of fuel and oil from heavy equipment. With respect to siltation, every precaution shall be taken with the installation of silt screens, construction of sedimentation basins and pumping of silted water when required. A monitoring program for siltation levels shall be developed to ensure that the silt level in the stream does not exceed 30 ppm above background levels, as defined in the Provincial Environmental regulations. The potential for any fuel or oil spillage can be minimized by performing daily inspections of heavy equipment, ensuring proper storage of fuel storage containers and by placing oil contaminant booms downstream of the construction area to contain any fuel that may inadvertently enter the stream. A more detailed plan for environmental protection will be developed for the Department of Environment and DFO prior to acquiring the necessary approvals from these departments.

#### **4. Operation**

As previously stated, the purpose of the water control structure is to increase water storage at Andrews Pond and to control the flow of water into the Shoal Harbour River. Once in operation, the downstream flows will be the same as in the present case, except in dry years when supplementary flows will be released. In addition to providing water for the Town, the supplementary flows will maintain minimum fish flow requirements for all the section of the Shoal Harbour River below Andrews Pond.

The storage in the pond between low and high water levels will be used to satisfy both the water demand for the Town of Clarendville, including the fishplant, and the minimum instream flow required for fish. The minimum flow requirement is 0.25 m<sup>3</sup>/s, as determined in the attached report, Wetted Perimeter Assessment, Shoal Harbour River. This is equivalent to 21.6 million litres per day.

The storage available in the pond between low and high water levels can reliably supply an estimated 5.5 million litres per day to the town in an extremely dry summer, such as that of 1961. It can supply 16.6 million litres per day in a year similar to 1987, the driest summer since Environment Canada began keeping flows records on Shoal Harbour

**ANDREWS POND CONTROL STRUCTURE  
ENVIRONMENTAL ASSESSMENT REGISTRATION**

---

River. In addition to the figures noted above, the pond can also supply the minimum fisheries flow requirements of 26.1 million litres per day.

In most years, therefore, very little drawdown would be required on the pond (although it could be provided if required for other reasons). The fact that supplementary flows will be required only occasionally means that there is considerable flexibility in operation.

The only constraints are that the pond must be full at the end of the spring runoff, and the water in the pond should be released only gradually at the required date in the early part of the summer to ensure that there is sufficient water to cover a dry period in August and September. No supplementary flows are expected to be required in winter, although it may be desirable to maintain a small flow through one of the gates or the fishway to keep a channel open.

The simplest method of operation is to allow the fishway to flow constantly, then open one or both gates when additional flow is required. Excess flow equivalent to the natural flow would pass over the spillway, or could be passed through the gates to provide attraction flow near the fishway during fish migration, if desired. The details of the fishway and of the most suitable operating regime will be determined in consultation with DFO.

**5. Occupation**

The workforce for this undertaking is estimated, but not limited to, the following.

- (1) 1 – engineering site representative
- (2) 1 – construction superintendent
- (3) 1 – construction foreman
- (4) 1 – iron worker
- (5) 2 – carpenters
- (6) 2 – general laborers
- (7) 2 – heavy equipment operators

**6. Project Related Documents**

- (1) Town of Clarenville – Shoal Harbour River Water Treatment Plant, Concept Design Report.

**ANDREWS POND CONTROL STRUCTURE  
ENVIRONMENTAL ASSESSMENT REGISTRATION**

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**Approval of the Undertaking**

Before construction for the water control structure can begin, approval from the following regulatory bodies may be required.

<b>Permit, Authorization &amp; Approval</b>	<b>Governing Body</b>
<b>FEDERAL</b>	
Transportation of dangerous goods	Transport Canada
Authorization for works or Undertakings Affecting Fish and Fish Habitat	Department of Fisheries and Oceans
Permit for Construction Within Navigable Waters	Canadian Coast Guard
Notification to Handle or Transport Dangerous Goods	Transport Canada

<b>PROVINCIAL</b>	
Release from the Environmental Assessment Process	Government of Newfoundland & Labrador Department of Environment and Labour, Environmental Assessment Division
Certificate of Environmental Approval for any alteration to a water body	Government of Newfoundland & Labrador Department of Environment and Labour, Water Resources Division
Water Use Authorization	Government of Newfoundland & Labrador Department of Environment and Labour, Water Resources Division
Permit for Access off any Highway	Government of Newfoundland & Labrador Department of Works, Services & Transportation Transportation Regulation Enforcement
Authorization to Handle or Transport Dangerous Goods	Government of Newfoundland & Labrador Department of Works, Services & Transportation Transportation Regulation Enforcement
Borrow and Quarry Permit	Government of Newfoundland & Labrador Department of Mines & Energy Mineral Lands Division
Authorization to Control Nuisance Animals	Government of Newfoundland & Labrador Department of Forest Resources and Agrifoods Wildlife Division



**ANDREWS POND CONTROL STRUCTURE  
ENVIRONMENTAL ASSESSMENT REGISTRATION**

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<b>Permit, Authorization &amp; Approval</b>	<b>Governing Body</b>
Permit to Burn	Government of Newfoundland & Labrador Department of Forest, Resources and Agrifoods, Forest Fire Protection
Commercial Cutting Permit	Government of Newfoundland & Labrador Department of Forest, Resources and Agrifoods, Newfoundland Forest Services
Operating Permit	Government of Newfoundland & Labrador Department of Forest, Resources and Agrifoods, Newfoundland Forest Services
Certificate for Approval for Storage and Handling of Gasoline and Associated Products as per Fire Protection Act and GAP Regulations	Government of Newfoundland & Labrador Department of Government Services and Lands, Operations Division
Certificate of Environmental Approval to establish, alter, enlarge or extend a waste management or a waste disposal site or incinerate as per Waste Material Disposal Act.	Government of Newfoundland & Labrador Department of Government Services and Lands, Operations Division
Permit in Accordance with Urban and Rural Planning Act for access onto a Protected Road.	Government of Newfoundland & Labrador Department of Government Services and Lands, Operations Division
Permit for Flammable and Combustible Liquid Storage and Dispensing and for Bulk Storage.	Government of Newfoundland & Labrador Department of Government Services and Lands, Engineering Services
License of Occupation to Occupy Crown Land	Government of Newfoundland & Labrador Department of Government Services and Lands, Customer Services
<b>MUNICIPAL</b>	
Approval for Waste Disposal	Town/Community Council

**ANDREWS POND CONTROL STRUCTURE  
ENVIRONMENTAL ASSESSMENT REGISTRATION**

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**Schedule**

The ideal time for construction of the water control structure would be during the period of lowest flow in the Shoal Harbour river, which is from July to September, 2003. The project has to go through the environmental assessment process, design, design approval, tender call/award of contract and mobilization. Based on this, it is projected that the earliest possible start date for the project would be the first week in July. It is also necessary to construct the structure during the low flow months to avoid complications with construction and to limit any possible effects to the environment through siltation, which puts the latest possible start date at the first week in August. Once construction begins, it is estimated to take 2 weeks for upgrading and construction of the site access road, 4 weeks for construction of the water control structure, 1 week for site cleanup and 1 week for demobilization, for a total construction period of 8 weeks. In the unlikely event that construction cannot be completed in this time frame, the flow of the river will be maintained throughout the winter months through the diversion stream around the control structure. This will allow for continued flow of water into the shoal harbour river and thus ensure adequate passage for the various fish species during this time and also allow for continuous drainage for the Andrews pond basin.

**Funding**

Funding for the project has been approved to the Town of Clarendville, through the Canada/Newfoundland Infrastructure Program 2002.