

**Report to Town of Blue Mountains****April 27, 2011****Subject: HAINES DAM STUDY****Background:**

Haines Dam is a former mill dam located in Clarksburg. It was acquired by the GSCA as part of the floodplain acquisition program in 1970. The dam is over 100 years old and in poor condition. It is an overflow weir type structure with a small control gate that is not operated. The dam is about 3 metres high with a reservoir behind that contains sediment. The dam has no flood control function.

Some rehabilitation was done on the concrete weir and a fishway was added in the 1980's. The dam would not meet current dam safety standards. This structure represents a significant long term liability and provides little public benefit.

In 2009, a significant leak through the north dyke at dam was identified. In consultation with an engineer from the Ministry of Natural Resources it was determined that this leak and the erosion of the dyke that resulted from the flow of water was a major concern for the stability of the structure.

In September of 2009 the GSCA Board directed staff to request proposals for a 3 stage assessment of the dam. The first stage was an evaluation of the leak through the north portion of the dam. The second stage was a full engineering assessment of the entire dam and the third was to study the potential for decommissioning and removal of the dam. The cost for stage 1 was \$28,000, the cost for stage 1 and 2 combined was approximately \$60,000 and the cost for stages 1, 2 and 3 combined was approximately \$85,000.

At budget time in early 2010 the board determined that only stage 1 should proceed in 2010. Stages 2 and 3 were dropped from the study. Upon receiving a 50% grant on the cost in June of 2010, the firm of Hatch Energy was hired to undertake the Stage 1 study of the leakage problem at a cost of \$28,000. The study was completed in December 2010.

## **Stage One Study Results:**

The study report identified that water was leaking under a concrete wing – wall on the upstream side of the dam and through the earthen dyke to the downstream side. The flow of water was eroding the soil in the dyke creating a hole through it. The process was accelerating as more soil was washed out and the hole got larger. There is a threat of the dyke failing allowing the river to bypass the end of the dam and eroding the adjacent valley slope leading up to some residential properties.

The proposed repair identified in the report involves removal of a portion of the dyke, repair to the concrete wall and replacement of the dyke with suitable compacted clay till material. The new dyke would also be protected with rock on the downstream side.

The estimated repair cost, including final design, preparation of tender documents, tendering, construction and construction supervision is approximately \$125,000.

In October 2010, while the study was underway, the consultant recommended that an inexpensive temporary repair be undertaken to slow the progression of the erosion in the short term. Under their supervision a 300 mm perforated pipe was installed into the downstream side of the dyke to collect some of the water coming through the soil. By collecting the water in the pipe the flow of water through the soil has been reduced and the rate of erosion has been slowed. Gabion stone was placed on the eroded bank to protect the soil surface from erosion and to add weight for stability to the bank. The work was done for less than \$1000.

### **Options for 2011/2012:**

The GSCA 2011 budget contains the \$125,000 estimated cost for repair in 2011, subject to 50% grant from the Ministry of Natural Resources through the Water and Erosion Control Infrastructure program. The budget figure was established on the premise that the board's previous direction was to proceed with repair rather than with further stages of the study.

The Authority would be committing to this expenditure without the benefit of a full dam assessment to determine what other costs may be incurred in the future. At this point in time the condition of the remainder of the dam is unknown. Also unknown is the cost of decommissioning and removal of the dam in relation to the current and potential future repair costs which would have been determined if the 3 stage study had been completed.

Given the age and general condition of the structure, a further engineering assessment of the entire structure will likely be required in the near future regardless of whether or not the current repair work is done. The current repair is necessary to maintain the structure in the short term. However, it must be recognized that further extensive repair or the possibility of decommissioning and removal of the dam may be necessary in the foreseeable future.

The engineer's report did not indicate that the dyke was in danger of imminent failure and the temporary repair has slowed the progression of the erosion. If necessary, the proposed repair could be delayed for one year. Given the cost of the initial repair and the unknown condition of the remainder of the dam, it may be prudent to complete the remaining phases of the study in 2011 in order to have the complete picture with respect to possible future costs before committing \$125,000 to the initial repair option.

Once the studies are completed, work could proceed in 2012.

## **Options for 2011**

### **Option One:**

**That the Grey Sauble Conservation Authority continue with the completion of stage 2 (full engineering assessment) and stage 3 (decommissioning and removal costs) of the Haines Dam Study in 2011 at an estimated cost of \$60,000, prior to undertaking repairs to the north dyke, subject to approval of the 50% funding from the MNR through the Water and Erosion Control Infrastructure program.**

### **Option Two:**

**That the Grey Sauble Conservation Authority move directly to the stage 3 study (decommissioning and removal), subject to the support of the Town of Blue Mountains. It is recommended that this option include a public information meeting to make the local residents aware of the decommissioning option and gauge their support for the eventual removal of the dam. The cost estimate for the stage 3 study is \$30,000.**

**As part of this option, the stage 3 study would examine the existing sediment behind the dam, and would estimate the cost of rehabilitating the entire site, including the dam and adjacent pond area.**