HATCH™

Project Memo

September 17, 2010

TO: Karen McGhee (MKE Limited) FROM: Jason Shaw

cc: C. R. Donnelly

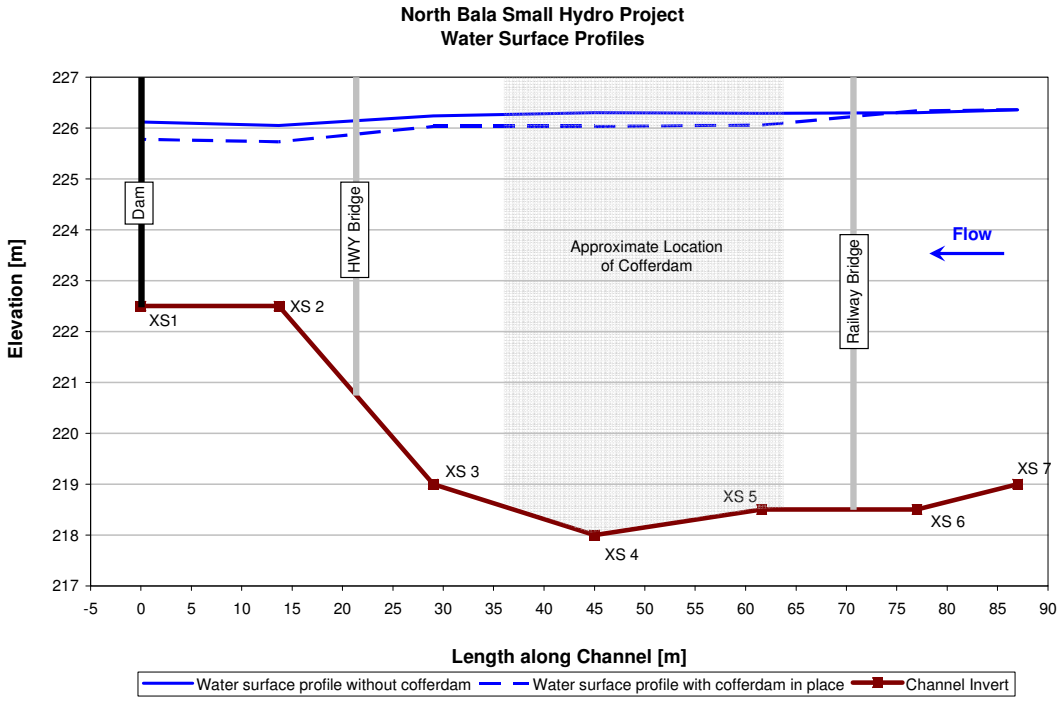
Swift River Energy Limited
North Bala Hydroelectric Project

Response to Outstanding Issues Regarding the Development of the North Bala Hydroelectric Project

Walt Schmid (CAO Muskoka Lakes Township) summarized the outstanding issues identified at the Special Council Meeting on August 11, 2010 for Karen McGhee and Jason Shaw during a telephone conference call on September 1, 2010. The issues were discussed and the conference call was concluded with a request by Mr. Schmid to provide him with statements that would address, and bring closure, to these issues. The following text represents a summary of the conference call and Hatch's response to the issues.

1. Review of the flow estimate in the north channel with the cofferdam in place.

    a. *The flow capacity estimate of the north channel, while the cofferdam is in place, has been reviewed and found to be reasonable. That is, the capacity of the channel is expected to reduce by 40 m^3/s to 178 m^3/s (from 218 m^3/s) when the lake level is at 226.4 m (i.e., the 100-yr lake level). This estimate was based on the results of a numerical model designed to simulate flow in the reach between the dam and 15 m upstream of the railroad bridge. The figure below illustrates the anticipated water surface profile for both cases. With the cofferdam in place, the water surface drops and the flow accelerates as it passes downstream, but the flow regime (subcritical) is unchanged. At the dam, the water level will be reduced by 0.3 m. It is important to note that this predicted flow behavior is subject to diligent operation of the dam in case such a flow event presents itself during construction. The flow regime will be sensitive to the status of the logs in the dam and any changes made to them. For the purpose of this assessment, it was assumed that all logs were out during the simulations. If any logs remain in the dam during such an event, the capacity of the channel will be further reduced. It should be noted that MNR will continue to be responsible for the operation of the dam including the stop logs throughout the construction period, and that an extreme flood event such as this would not come without notice as it moves down the river. MNR and SREL (including its contractors) will need to maintain close communications regarding the water levels for the period that this cofferdam is in place.*



2. Flood risk with the presence of the cofferdam.

    a. *Construction in water has inherent risks that must be managed. As noted in Statement No. 1 above, the conveyance capacity of the north channel will be reduced during construction and consequently increase the risk of flooding. As such, management of this risk must be included as part of the overall design. Components of the risk management scheme will include, but not be limited to, the following.*

        i. *Construction Schedule – Construction of the upstream cofferdam will be scheduled after the spring freshet of the first year and removed before the spring freshet of the following year. While it is entirely possible that the work will be completed faster and the cofferdam removed earlier, it is too early in the process to make this commitment. Note that if delays lengthen the construction schedule provisions will be made to ensure the cofferdam is removed before spring freshet and replaced the following July as required. This scenario will be dependent on the type of cofferdam that the contractor proposes and, as noted below, MNR's review of the structure.*

        ii. *A cofferdam design that will expedite its removal – A well-designed cofferdam with the footprint illustrated in the October 2009 Environmental Screening Report will be designed so that it can be breached and removed in a matter of hours to alleviate the flow constriction. Note that design of the cofferdam is typically the responsibility of the Contractor and that this design will ultimately be reviewed by MNR's engineers (i.e., Nick Paroschy) prior to commencing construction as part of the Plans and Specifications Approval for the project.*

        iii. *Flood Forecasting – Review MNR's procedure for flood forecasting and, if necessary, provide enhancements that specifically address the construction project.*

iv. *An emergency flood plan – Review MNR's flood management plan for the Muskoka watershed and, if necessary, provide temporary measures that will control/restrict flow entering Lake Muskoka in an effort to maintain manageable water levels/flow during construction.*

An illustration of the use of these types of risk management measures is seen in a recent Hatch project in southern Ontario. Hatch provided the design and construction management for the modification of a stilling basin of a 33-m high dam. The work required concrete construction below water immediately downstream of the dam. The construction plan called for the erection of a sheetpile cofferdam to create a dry area for machinery and workers. The construction was planned for 2 years where the schedule dictated assembly of the cofferdam after the spring freshet and fish spawning period and removal before the spring freshet of the following year. The owner provided the water level and flow ranges expected during construction which formed the basis of design specifications for the cofferdam. As part of normal operation, the owner regularly monitored weather conditions and provided ample warning of significant flood events that may have impacted the construction zone.

3. Water velocity in the north channel under normal operating conditions.

   a. *The preferred option is a 4.3-MW plant with a rated flow capacity of 96 m^3/s. With a water depth of 225.25 m (normal depth), an intake invert elevation of 211.4 m, and an intake width of 9.5 m, the velocity at the intake would be 0.73 m/s (at the trashracks). To maintain an intake velocity (at the trashracks) of 0.6 m/s and comply with several design objectives (e.g., minimize fish mortality, minimize frazil ice problems), the width of the intake (at the trashracks) must be increased to 11.6 m. This increase in width, however, is not necessary for either safety or regulatory requirement, but instead for an improvement to operations. Unfortunately, an illustration reflecting this size was not included in the Environmental Screening Report. The impact of this intake velocity on the upstream flow behavior during normal operating conditions was illustrated by the results of the field measurement program conducted in December 2008. Although the flow at the north dam was 80 m^3/s when the measurements were made, the field results provide the best estimate of velocity in the upper north channel when the plant is operating near its capacity and their accuracy is commensurate with this level of study. If water velocities at the Bala Wharf are higher than originally anticipated (following commissioning of the plant) mitigation measures could be employed to resolve the situation.*

JS:mll