From: Mitchell Shnier Date: August 1, 2017

Protecting the District Municipality of Muskoka's interests for the proposed hydro-electric generating station at the Bala falls

1) The MNRF's concerns for their assessment of the proponent's proposed upstream cofferdam design are only:

   a) Water flow through the Bala north channel.

   b) Potential damage to the MNRF's Bala north dam.

   However, the District Municipality of Muskoka's (the District) concerns are only:

   a) Potential damage to the District's Muskoka Road 169 bridge over the Bala north channel (the "Highway Bridge").

   b) Potential damage or changes to Muskoka Road 169 itself.

   That is, responses from the proponent concerning the MNRF's approval process do not apply to the District's concerns or interests, as the MNRF's mandate and interests are different than the District's, and the MNRF has no expertise for bridges or roads.

   In fact, on this specific issue, the MNRF has stated: *"With regards to possible impacts to Municipal infrastructure, the proponent is responsible to obtain all necessary approvals for the proposed work from other agencies."* Therefore, any comments from the MNRF do not apply to the District's concerns, and the District should not infer anything from any input from the MNRF.

2) This is at least the fourth completely different design the proponent has proposed for their upstream cofferdam for their currently-proposed Alternative 1A hydro-electric generating station (the "Proposed Project").

   It is important to note that the proponent abandoned their previous proposed cofferdam designs when they learned these did not address the above needs of the MNRF. It is not currently known if the current design would meet the MNRF's needs, or the District's needs.

3) Concerning the District's interests for the proponent's currently proposed upstream cofferdam, we have the following questions.

   a) Has CRT Construction previously designed and installed a cofferdam of the type proposed for the Proposed Project.

   b) Have the design drawings for the proposed cofferdam been sealed by a Professional Engineer licensed and insured to practice in Ontario.

   c) We understand that WSP Canada Inc. provided a letter to address the District's concerns. Could you forward to me a copy of this letter and any reply to it from R.J. Burnside & Associates Limited.

   d) The proponent's construction plans include a central deflector wall which would direct water towards the Proposed Project's intake. When the proposed generating station is not operating, this deflected water would have to go somewhere.

      There could be combinations of water levels, flows, and dam stop-log configurations that would result in a swirling action causing erosion at the south abutment of the Highway Bridge. Due to the complex and three-dimensional nature of the flows, only scale model testing or 3D simulation could show if this is a problem.

This should be done for two heights of the central deflector wall:

- No higher than the bottom sill of the Bala north dam, as the proponent currently plans.
- As much higher as the proponent may install in the future. This should be resolved now, as the District would not have any power to require such an assessment in the future as the proposed central deflector wall would not be on District land.

e) The Proposed Project would result in changes of the speed, volume, and direction of water flow (which may include ice floes), acting on the support piers for the Highway Bridge:

- During proposed construction:
  - For the various directions of flow according to which doors are opened in the proposed cofferdam, or how it would be sealed to the bottom of the riverbed.
- During proposed operation:
  - The increased water velocity due to the 2015 narrowing of the Bala north channel between the CP Rail bridge pier footing and abutment.
  - The direction of the flow would be changed due to the flow into the Proposed Project.
  - Due to the additional flow into the Proposed Project, the flow in the Bala north channel could be 96 m^3/s greater than it has ever been in the past.

Due to the complex nature of this flow (such as the variable depth of the Bala north channel, and the shape of the Highway Bridge support piers), scale model testing or 3D simulation would be required to assess this.

f) Has there been an inspection of the Highway Bridge pier footings to determine if they could withstand the above changes in flow, or be damaged by the proposed nearby excavation.

g) I understand the first proposed work would be:

- For divers to drill holes in the Bala north channel riverbed.
- A geologist to assess the subsurface conditions.
- Testing of the strength of rock anchors.

Would the cofferdam be fabricated in advance of this initial visit and be on-site at that time. Or would the cofferdam fabrication begin after this initial investigation work.

h) I understand the north-south section of the proposed cofferdam would be held vertical by tie-backs to the east, secured with rock anchors on the riverbed of the Bala north channel which would be east of the Highway Bridge.

- How many tie-backs would there be.
- How would the forces on these tie-backs be equalized, and verified to be equalized, as in practice they would all have slightly different lengths. So the shortest tie-back could be over-stressed to failure, and this could repeat for each, causing a catastrophic failure of the cofferdam.

i) What analysis has been done of the forces on the proposed cofferdam. For example, for the west-east section of the proposed cofferdam, would there need to be tie-backs to the north.

j) Would the frame of the proposed cofferdam be left in place during the spring freshet. If so:
   - The tie-backs and open frame of the proposed cofferdam would be an obstruction to ice floes during the spring break-up.
   - Have all components been designed to withstand the forces of the ice, and could they cause an ice jam, preventing flow through the Bala north channel

k) Does the proponent agree that their proposed excavation beside Muskoka Road 169 would be more than 60' below road level.
   - How would the shoring be done to prevent any damage to Muskoka Road 169 at this excavation.
   - Would there be any excavation or disturbance of District land, for example, for shoring.
   - Would there be any impact on road traffic during this excavation.

l) The proponent is to provide a Letter of Credit to protect the District's interests, for example, if there was to be any damage to the Highway Bridge. I understand this Letter of Credit is to be augmented by insurance.

   Would there still be a $2,000,000 Letter of Credit in place for the entire duration of any drilling, excavation, construction, and commissioning activities.

m) During the proposed construction, the proponent would remove a significant length of steel guardrail along Muskoka Road 169. This would be replaced by a temporary barrier, such as a concrete Jersey barrier.

   Such barriers do not provide as effective control of vehicles leaving a roadway, and this would be of particular concern due to the embankment down to Portage Landing and due to the proposed deep excavation.

   Has the proponent provided the following:
   - Detailed engineering drawings of the proposed temporary barrier, showing its extent, design, anchoring, method of linking sections together, and distance from any embankment or excavation.
   - Design calculations showing the protection that would be provided for various speeds and types of vehicles, at various angles of departure from the road.

n) Would the excavation for this Proposed Project require an Excess Soil Management Plan, if the work is done after these regulations are in place.

o) Given that the proponent's 2013 Environmental Site Assessment showed the level of Zinc in the groundwater was above MOECC's guidelines, has a Qualified Person determined whether a Record of Site Condition is required.