Technical Memorandum

Date: August 12, 2008

To: Denis Gourde, Sebastian Tolgyesi, Sylvain Doire

Cc:

From: Randy Baker

RE: Water Column Turbidity Interpretation

The purpose of this Technical Memorandum is to provide perspective on turbidity levels in Second Portage Lake east and west of the silt curtains surrounding the East Dike construction area as it relates to fish and fish habitat.

Between August 6 and August 9, shortly after initiation of dike construction, total suspended solids (TSS) concentrations (mg/L; based on turbidity (NTU) monitoring) became elevated in Second Portage Lake at select stations east of the silt curtain. A significant increase in turbidity was observed a station SE3, our southern most station east of the dike. At station W4 south-west of the dike, a similar phenomenon was observed, although to a lesser extent. Increases at all other stations were low.

Turbidity at SE3 increased from less than 5 NTU to in excess of 110 NTU over period of 3 days. Although maximum 24-hour TSS thresholds (50 mg/L) were not exceeded at any time, and despite remedial actions and changes in construction practice, the 7-day running average TSS threshold (15 mg/L) was exceeded on August 9 at SE3 with an average of 15.5 mg/L.

This localized phenomenon is presumed to have been caused by dike construction in a deep zone of the lake. Fine lake-bed sediment was disturbed and introduced into the water column that, combined with strong north-east winds pushed a sediment plume beneath the silt curtain and along the south shore of the lake. These sediments appear to have settled in a lake depression (8 – 10 m) in the vicinity of SE3, and a lesser extent, W4 (on the impoundment side). Changes in wind patterns have reduced the sediment load in shallower depths (<7 m). However, concentrations at depth (>7 m) have persisted, irrespective of dike construction activity. These elevated concentrations continue to drive exceedences of the weekly threshold (up to 19 mg/L as of Aug 12). Water quality monitoring at all other stations does not reveal that any other areas are significantly at risk of exceeding weekly-threshold values.

Impacts to fish and fish habitat are likely small because of the spatially small area affected and because the phenomenon is limited to low value habitat at a depth of greater than 7 m.

To determine the medium-term impacts of the exceedence, we have two sets of sediment traps set at high value habitat locations in the vicinity of SE2 and SE3. These will assist in determining if the sediment load in the water column is being deposited over shallow substrates. In addition, the Aquatic Effects Management Plan (AEMP) stipulates that monitoring of the benthic community will take place in 2009 to determine what if any impacts there may be to the benthic community from sedimentation in deeper areas of the lake.

Please do not hesitate to contact us if you require further information
Regards
Randy Baker