

July 21, 2017

Board of Managers
Clearwater River Watershed District
P.O. Box 481
Annandale, MN 55302

Re: BWSR Advisory Report for School Section Lake Outlet Project #17-1, Clearwater River Watershed District

Dear Managers and Project Engineer,

On behalf of the Board of Water and Soil Resources, I offer this advisory report in accordance with Minnesota Statutes, Section 103D.711, Subdivision 5. As indicated in Subdivision 5, the BWSR report shall include:

- 1) a statement about the completeness of the report in relation to statutory requirements;
- 2) a statement as to whether or not the report presents a practical plan;
- 3) recommendations for changes, if considered advisable, and
- 4) a recommendation as to whether a soil survey appears advisable.

General Comments

The engineer's report appears to present a practical plan and to be complete in relation the requirements of Section 103D.711, Subd. 2, subject to the following specific comments and recommendations. A soil survey or investigation does not seem necessary.

Specific Comments

Section 1.0 Project Location: It would be helpful to include information and a photo or two about the shoreline characteristics at the lake outlet location, including shoreline materials and vegetation, beach width, a nearshore bathymetric and topographic profile at the outlet (I see some survey data on Sheet C-101), information about any littoral drift of beach material along the shoreline, and characteristics of any ice ridge along the shoreline.

Section 2.0 Project Need, p. 2-2: The original outlet structure at the lake is identified, but not described, or reference made to an applicable drawing in the report. The report does not indicate if the original design or subsequent surveys documented the profile of the original outlet for current and future reference. The extent and cause(s) of sediment accumulation in the outlet conveyance is not defined. The condition of the remainder of the outlet is not discussed, but presumably is adequate.

Section 3.0 Alternatives Considered: Subsection 3.3 Option 3, implies that sediment currently migrates into the pipe, but the extent of this as a problem and any need for pipe cleanout is not indicated as a component of this option. Sheet C-101 Concept Plan indicates that an existing control weir within a manhole will be removed, but Option 3 does not describe this project element and why it's proposed.

Table 5.3: Estimated Project Costs, p. 5-3: The construction cost listed here is not the same as itemized in Table 5.4 Estimated Project Costs – Construction, Engineering, Permitting, Legal and Administration.

Sheet C-101 Concept Plan: The labels of some of the Survey Shots near shore and at the outlet structure are

unclear to me. Although I realize that the Schematic Profile View is a preliminary schematic, it doesn't show the top elevation of the sheet pile along the sides of the weir box in the background of the cross-section, or the proposed Wooden Outlet Cover. It's not clear if/how the Wooden Outlet Cover will be connected to the sheet pile weir box and how the riprap will be sloped to fit.

I wonder how ice push / jacking will occur at the structure and what the effects will be. The report indicates on p. 3-4 that a similar outlet has been in operation at Pleasant Lake with positive results and low maintenance costs, but does not indicate if the outlet location on Pleasant Lake is subject to significant ice jacking. I would have some concern about the potential effects of ice jacking on the proposed outlet structure and cover, based on the history of ice jacking being a significant part of the problem. Knowledge about past ice jacking that occurs at the project location could be helpful to predict if, or what effects, it may have on the proposed outlet structure. I believe it's fair to say that recent winters with less snow and more freeze-thaw cycles have made this more of a concern.

If you have questions about this advisory report, please call me at 651-297-2907, or e-mail at al.kean@state.mn.us.

Sincerely,



Allan M. Kean, PE
Chief Engineer

cc: John Jaschke, Executive Director
Dave Weirens, Assistant Director
Kevin Bigalke, Central Region Manager
Jason Weinerman, Board Conservationist
Nicola Blake-Bradley, Area Hydrologist, DNR