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## From blue to green; phosphorus loading a concern with augmentation

BY DEBRA NEUTKENS  
EDITOR

**WHITE BEAR LAKE** — Pumping 2 billion gallons of water from Vadnais Lake into Commercial Bay would raise the lake about 2 feet.

The cost to transport that water 5 miles through a 24-inch pipe would be about \$48 million.

Those figures were provided by SEH Design-Build to stakeholders April 13 in a meeting called by the Department of Natural Resources (DNR) at City Hall.

The company is a subsidiary to SEH, a Vadnais Heights engineering firm familiar with augmentation systems, and the only one to sign a contract with the DNR to do a design-build proposal.

A two-stage approach is part of the SEH plan that draws Mississippi river water from Vadnais Lake. The pipeline would travel beneath Goose Lake Road (County Road 14) and tunnel under major intersections at County Road E, I-35E, Highway 61 and White Bear Avenue, eventually extending 2,500 feet offshore.

SEH engineer Chris Larson, water project manager, said mechanical filtration

## AUGMENTATION: Design-build proposal estimates cost at \$48 million

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will prohibit the transfer of zebra mussels veligers but the proposal does not guarantee water quality goals, specifically phosphorus level, without further study.

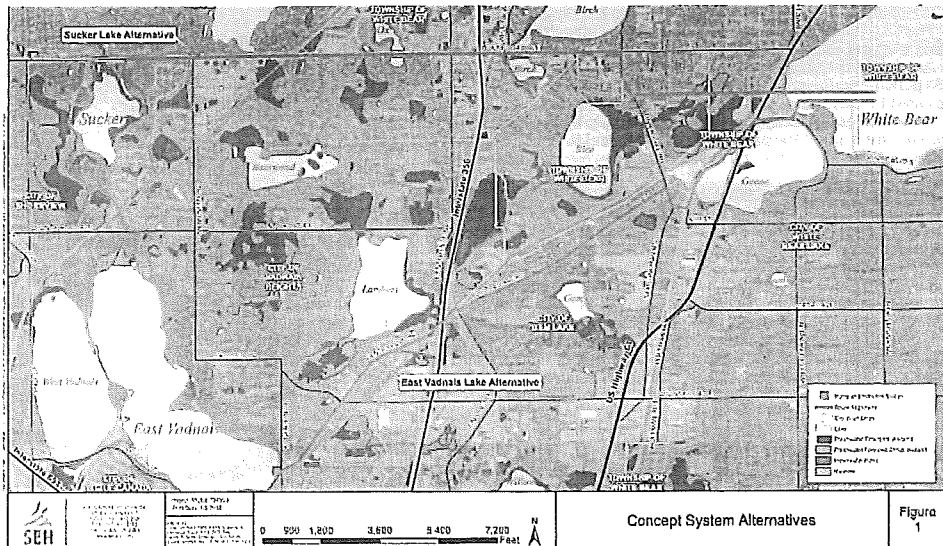
Stage one includes final design and determination of final costs, along with a water quality analysis estimated to cost up to \$7.5 million. Stage two includes construction and startup operations. Larson put the cost for Stage two at \$34 million. "That's in today's dollars," he said. "It's very likely this won't get built this year. We're projecting \$40.5 million if 2024 is the midpoint of construction."

The proposal includes detailed water filtration, alignment layouts, a range of estimated environmental review and permitting costs, detailed construction cost estimates and estimated operating costs.

The design-build is not typical, said DNR Assistant Commissioner Barb Naramore. There is no funding for a project or authorization. Money from the clean water fund in the amount of \$150,000 was made available by the 2016 Legislature for three design-build proposals but ultimately, only one firm elected to proceed. "There was a lack of interest from the others," she noted.

Stipulations that came with the appropriation included assurance that water quality in both lakes is not diminished, including the spread of invasive species or increased phosphorus.

Phosphorus is a nutrient that in excessive concentrations can cause algae blooms, loss of water clarity and other adverse impacts. The higher levels of phosphorus in the river and East Vadnais Lake relative to White Bear Lake are a particular concern.



This map shows the route a pipeline will take from Vadnais Lake to White Bear Lake. Cost estimates were provided for a design that will pump 6,000 gallons per minute into White Bear Lake non stop for eight months out of the year.

"For every foot of augmentation, expect 0.6 micrograms per liter of phosphorus concentration," said a limnologist with Wenck Associates, Joe Bischoff. "It's not a lot but it's not insignificant."

Sulfate levels are another concern when transferring river water and can lead to increased mercury content in fish, the water quality expert noted.

According to Larson, treating the water beyond basic filtration would increase the capital costs of an augmentation project by \$23 to \$40

million, depending on the technology chosen.

Naramore made it clear at the beginning of the presentation that the DNR is not advocating for augmentation. "We are fulfilling a directive by the Legislature to request a design-build," she said. "No project has been authorized or funded at this time."

When asked the next steps, DNR Section Manager Jason Moekel said the SEH proposal will be sent to Legislative committee chairs and area delegates.

"We'll presume legislative interest in discussing the report," added Naramore. "Stay tuned and we'll see where things go in the remainder of the session."

Before serious consideration of augmentation, "We need to look carefully at implications for long-term lake health," Naramore maintained. "White Bear is a lake that historically has varied over 7 feet. There are important ecological functions that much variation triggers."