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## **North Center/North Lindstrom Lakes Channel Recommendations**

**Date: January 13, 2015**

**To: Chisago County Board of Commissioners**

**From: Chisago Lakes Lake Improvement District Board of Directors**

### **LID BOARD MEMBERS**

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**Jerry Spetzman**

Administrator

**Cassie Waltz**

Water Resource Specialist

The purpose of this letter is to summarize the background, process, and steps taken by the Chisago Lakes Lake Improvement District Board (LID) in formulating a North Center/North Lindstrom Channel project recommendation.

### **Recommendations:**

After thorough consideration of the options recommended by the North Center North Lindstrom Channel Restoration Feasibility Task Force, the LID Board recommends postponing further action on widening the channel between North Center and North Lindstrom Lakes until County Road 20 bridge design options are further developed. This recommendation takes into consideration the fact that a bridge height at the 3-foot above ordinary high water mark would negatively impact the navigability of the channel and would likely influence improvement plans.

The LID Board recommends the County Board move forward with the plan which places the bottom of the **County Road 20 bridge at 6.5 feet above ordinary high water**. The 6.5 foot option offers the following benefits:

- Allows for the safe passage of most boats in all water level conditions whether the entire channel is used or just the portion closest to North Lindstrom and Bull Lakes.
- Allows for more and better near-term options for successful development of recreational boating uses such as the County Water Trails system and the development of Allemansratt Park as a paddling destination.
- Keeps more and better future options open for the 75-100 year expected life of the bridge.
- Creates a safe way for snowmobiles and other off-road vehicles to pass under the bridge in the winter.

Besides being a popular boating and fishing destination in the summer, the Chisago Chain of Lakes is a very popular winter destination for snowmobiles and off-road vehicle enthusiasts. As we have seen with the two new Highway 8 bridges recently completed on the Chain of Lakes, when a bridge design allows for snowmobile or off-road vehicle traffic to pass beneath, drivers prefer that safer route instead of over crossing the highway. While the Highway 8 bridges allow more than adequate head clearance, a County Road 20 bridge at the 3-foot mark would not offer safe clearance in mid to high water level scenarios and changing water levels could contribute to drivers misjudging available clearance.

The Background; Process/Steps; Findings & Options; and Chronology details are provided below and can be reviewed to assist in understanding the recommendation.

### **Background:**

Historically, North & South Center, North & South Lindstrom, Chisago and Bull Lakes were one lake – formerly known as Ki Chi Saga by Native Americans and Big Lake by European settlers. Over time, the lakes were split into multiple lakes first by the Wyoming-Taylor's Falls railroad and then by Highway 8. In addition, the connection between North Center and North Lindstrom lakes has been altered by roads and development.

There is interest in the community to reestablish the historical connections between the lakes. Reconnections have taken place – a new bridge was installed between North & South Center Lakes, and as part of the Lindstrom Split Pairs Project a new bridge was installed between North Lindstrom and South Lindstrom Lakes. Designs are currently in development to upgrade the Highway 20 bridge between North Center and North Lindstrom lakes.

The modern day “channel” between North Center and North Lindstrom Lakes consists of an open water and vegetation choked wetland complex. Historic photos show a complete waterway connection during periods of higher water. In 2011 the LID Board of Directors began the formal process of evaluating the North Center/North Lindstrom Channel concept by recommending Preliminary Feasibility Investigations. The County Board concurred and the process began.

While there may be positive community benefits to reconnecting North Center and North Lindstrom Lakes, there are also multiple complex considerations. Considerations include bridge design impacts to wetlands; hydrology; water quality; availability and/or purchase of land and easements; presence and protection of high quality wetlands; lake level differences; water quality differences between North Center & North Lindstrom Lakes; presence and potential transfer of aquatic invasive plants or animals; waterway volume and flow; predictability and frequency of waterway elevation fluctuations; federal/state agency permitting requirements; further environmental assessment work; and overall costs.

## **Process/Steps:**

Following its inception with the **Preliminary Feasibility Investigations** in 2011 and **Assessment of Possible Impacts to Wetlands, Hydrology and Water Quality** in 2012, the County Board established **Channel Restoration Feasibility Task Force**. The task force was initiated in 2012 to guide the process and develop recommendations for possible channel restoration. The task force directed the preliminary environmental assessment and feasibility studies to guide the process and refine the viable options. This eliminated several scenarios leaving three generally viable options.

During the process the Task Force sought public opinion by conducting a survey within the Chisago Lakes area. While survey questions and methodology were not scientifically developed, over 550 people participated and provided their input. Survey results indicated that 73% of respondents strongly or moderately support improving boat navigation between North Center and North Lindstrom Lakes; and 20% strongly or moderately opposed. In addition, survey trends can be reviewed concerning the use of tax dollars to accommodate boat navigation; preferred boat under bridge scenarios; property ownership/tax payer status; organizational affiliation; lake of closest association; and lake enjoyment/use.

In August 2013 the Task Force offered a recommendation to proceed with a **Feasibility Study to Prepare Preliminary Plans and Costs** for the “removable weir”, “widening”, and “do nothing” channel design options. In October 2014 the LID Board of Directors were presented with the completed feasibility study and cost estimates for the removable weir and widening options.

A more complete chronology of board actions and milestones, including costs incurred, is provided as an attachment to this letter.

## **Findings & Options:**

One of the key findings of the preliminary environmental assessment was that modifications to the channel, particularly lowering of the outlet elevation of North Center Lake, could have water level impacts to North and South Center Lake. This is of significant concern to both the DNR and many of the residents on the North and South Center Lakes. Because of this finding and the potential liabilities involved the LID Board made the decision *not* to pursue options that would have effects on water levels on North and South Center Lakes. The following are channel design options that the Task Force and LID Board considered.

**Option 1, Removable Weir:** In the fall of 2014 the LID Engineer presented cost estimates and water level modeling for two scenarios. One of the options was a removable weir which could be opened and closed under certain water level conditions. The advantage of this option would be that under high water conditions the weir could be opened and allow for a lower channel elevations potentially allowing more frequent boat traffic. The disadvantages of this option were the high capital cost estimated at \$634,000+, ongoing operations and maintenance, *and* modeling still showed potential for marginal effects on upstream water levels. With the fluctuations in lake levels (currently low) it is projected that this option would cause the channel to be reasonably navigable 60% of the time based on a 1 ft. water depth. The LID Board made the decision that the benefits of this option did not outweigh the costs and potential complications (including lake level modeling fluctuations) and decided/recommended to eliminate this option from consideration. The engineering and operational complications along with potential lake level alterations/conflicts give significant pause to considering this option. The cost is also significant and plays a role in the decision to remove this option.\*\*

**Option 2, Channel Widening:** The second option that was presented to the LID Board for consideration was a channel widening project at the pinch point near the North Center Lake outlet. This option would protect the surrounding infrastructure and relocate utilities as needed while allowing limited increased navigation. This project appears to be viable in that it would have minimal impacts to the hydraulic function of the channel and the upstream water levels. The preliminary estimated cost of the channel widening is \$232,000+. The project would still need to go through an Environmental Assessment Worksheet process and there will likely be concerns that widening of the channel will change the volume transfer/hydrology between the two lakes, and could inadvertently lead to lowering of the of the North Center Lake outlet elevation. Because of the current channel elevations would remain unchanged and there is dense vegetation in the wetlands between the lakes, the widened channel would only be useable under high water conditions thus limiting the usability of the connection between North Center and North Lindstrom Lake. With the fluctuations in lake levels it is projected that this option would cause the channel to be reasonably navigable 40% of the time based on 1 ft. water depth.\*\*

**Option 3, Do Nothing:** Doing nothing does not preclude the opportunity to consider future channel modification scenarios. It is important to note that the separate but distinctly related County Road 20 bridge reconstruction/height does impact the viability of future scenarios if the do nothing option is selected at this time.

*\*\*Summary slides and an Estimated Navigation slide discussing the Removable Weir and Channel Widening concepts are attached.*

## **2011–2015 Chronology of activity on the proposed North Center to North Lindstrom channel**

**June 6, 2011** The LID board of directors passed a motion recommending that the Chisago County Board of Commissioners approve a proposal to complete Preliminary Feasibility Investigations into the proposed restoration of the navigable channel between North Center and North Lindstrom Lakes.

**July 15, 2011** The Chisago County Board of Commissioners approved a proposal to complete Preliminary Feasibility Investigations into the proposed restoration of the navigable channel between North Center and North Lindstrom Lakes. \$8,818 was approved to complete Preliminary Feasibility Investigations.

The Preliminary Feasibility Investigation on the North Center/North Lindstrom Lakes channel connection has been completed. The investigations included a feasibility level survey, development of conceptual channel design, determining of permitting requirements and a memo summarizing the findings and recommendations for next steps.

The Preliminary Feasibility Investigation identified three primary items that need further assessment.

1. Wetlands assessment – refine existing wetland mapping, existing and future conditions wetland functional assessment.
2. Hydrologic assessment – develop a hydrologic model and test up to three channel restoration scenarios to optimize navigation and minimize wetland and water elevation change impacts due to restoration.
3. Water quality assessment – evaluate literature summary of potential effects and mitigating measures from recreational boat activity as it relates to the channel and data from the North Center Lake Total Maximum Daily Load study (TMDL). Qualitatively assess, project related, potential water quality impacts to North Lindstrom Lake due to changes in flows from North Center Lake, based on results of the Hydrologic Assessment and existing data from the North Center Lake TMDL.

**March 5, 2012** The LID Board of Directors approve a motion to recommend to the Chisago County Board of Commissioners the proposal to assess possible impacts on Wetlands, Hydrology and Water Quality relating to potential restoration of the navigable channel between North Center and North Lindstrom Lakes.

**March 21, 2012** The Chisago County Board of Commissioners approved a proposal to assess possible impacts on Wetlands, Hydrology and Water Quality relating to potential restoration of the navigable channel between North Center and North Lindstrom Lakes. \$24,100 was approved to assess possible impacts on Wetlands, Hydrology and Water Quality.

**November 5, 2012** The LID Board of Directors unanimously approved a motion to recommend to the Chisago County Board of Commissioners the formation of a North Center/North Lindstrom Lakes Channel Restoration Feasibility Task Force.

**November 21, 2012** The Chisago County Board of Commissioners approved formation of a North Center/North Lindstrom Lakes Channel Restoration Feasibility Task Force.

The purpose of the Task Force was to review the feasibility of possible channel design options and make a recommendation to the County Board of Commissioners. Task Force members included representatives of the following organizations:

**Task Force**

Center Lakes Association  
Chisago County Board of Commissioners  
Chisago County Highway Department  
Chisago County Zoning/Environmental Services  
Chisago Lakes Chamber of Commerce  
Chisago Lakes Lake Improvement District  
Chisago Lakes Township  
Chisago Lindstrom Lakes Association  
City of Lindstrom  
Lindstrom Parks Department

**Advisory Committee**

Chisago County Attorney's Office  
Chisago County Wetlands  
Chisago Soil and Water Conservation District  
Minnesota Department of Natural Resources  
US Army Corps of Engineers

**Facilitation**

Chisago Lakes Lake Improvement District  
Emmons & Olivier Resources Inc.

The appointed Task Force carried out their duty to investigate the feasibility of potential channel design options between North Center/North Lindstrom Lakes. The Task Force recommendation was presented to the LID Board of Directors who forwarded the recommendation to the Chisago County Board of Commissioners for consideration.

Four conceptual designs were evaluated. All design scenarios compared existing wetlands, water quality, and lake levels to potential future project conditions. A fifth design option to leave the channel in existing conditions was also maintained throughout the evaluation process.

The Task Force met 4 times to review channel data and consider the advantages and disadvantages of channel design options. In addition, the Task Force sought public opinion by conducting a survey within the Chisago Lakes area. While survey questions and methodology were not scientifically developed, over 500 people participated and provided their input. In addition, results from 51 written surveys gathered at Karl Oskar Days and Ki Chi Saga Days were not included in the electronic summary but were consistent with identifiable trends.

1. Survey results indicated that 73% of respondents strongly or moderately support improving boat navigation between North Center and North Lindstrom Lakes; and 20% strongly or moderately opposed.
2. In addition, survey trends can be reviewed concerning the use of tax dollars to accommodate boat navigation; preferred boat under bridge scenarios; property ownership/tax payer status; organizational affiliation; lake of closest association; and lake enjoyment/use.

**August 22, 2013** The Task Force made a recommendation for the LID to proceed with the next step of the feasibility study to prepare preliminary plans and costs on both the channel widening and removable weir channel design options for restoring navigation between North Center and North Lindstrom Lakes. The Task Force formulated and agreed on their recommendation by consensus.

**September 9, 2013** The LID board of directors accepted the Task Force recommendation. The LID board passed a motion recommending that the Chisago County Board of Commissioners approve Feasibility Study next step: prepare preliminary plans and costs for North Center to North Lindstrom channel flowage.

**October 6, 2013** The Chisago County Board of Commissioners passed a motion approving the preparation of preliminary plans and costs for improving the North Center to North Lindstrom flowage. \$34,300 was approved to prepare preliminary plans and costs.

**October 8, 2014** The LID board of directors were presented with and considered design specifications and costs for the Removable Weir option and the Channel Widening option.

**November 3, 2014** The LID board of directors passed a motion to exclude the Removable Weir option from any more discussions on the North Center-North Lindstrom channel, instead focusing on the feasibility of widening the channel for boat traffic with any other decisions being tabled for discussion at the December Lake Improvement District board meeting.

**December 1, 2014** The LID board of directors passed a motion recommending that the LID board draft a letter to the Chisago County Board of Commissioners highlighting the recommendation to postpone action on restoring the channel between North Center and North Lindstrom Lakes until County Road 20 bridge design options are further developed. The letter will include previous decisions and activities leading up to this point.