

**The Annual Report  
of the  
Chisago Lakes Lake Improvement District  
2010**



**North Center Lake, August 2010**

The Chisago Lakes Lake Improvement District (LID) was first established April 21, 1976 by resolution of the Chisago County Board of Commissioners. The District was reactivated by resolution of the County Board August 21, 1984. Resolution No. 090225-1 delegating specific authority to the Chisago Lakes Lake Improvement District and authorizing certain expenditures by the Lake Improvement District Board was approved by the Chisago County Board of Commissioners on February 25, 2009.

The LID is composed of seven elected members who are area residents. The current LID Board Members and their lake representations are:

<b>Assigned Area</b>	<b>Lakes of Representation</b>	<b>LID Board Member</b>
1	North Center Lake, North Lindstrom Lake, Little Lake	Henry (Bud) Kapell
2	South Center Lake, Ogren Lake, Linn Lake, Bloom Lake	Al Singer, Vice Chairperson
3	South Lindstrom Lake, Kroon Lake	Al Wahlgren
4	Chisago Lake	Chris DuBose, Chairperson
5	Green Lake, Little Green Lake	Fred Woodward
	At Large	Leigh Hugo
	At Large	Lou Sibik

The LID holds meetings on the first Monday of the month. An annual LID meeting is held every August. At the annual meeting, elections are held for any LID board member term positions that may be up for renewal or election. There were two LID board member seats up for election in 2010, Area 1 and an At Large seat.

The major lakes in the Chisago Lakes Chain of Lakes watershed are:

Bloom	Linn	North Lindstrom	South Lindstrom
Chisago	Little	Ogren	Spider
Emily	Little Green	Pioneer	Swamp
Green	Mattson	School	Wallmark
Kroon	North Center	South Center	

The District is approximately eleven miles long and averages three and a half miles in width. A map of the Chisago Chain of Lakes watershed is included in Appendix A.

### **Mission Statement**

To protect and restore the surface water resources of the Chisago Lakes watershed.

## Goals

- Preserve, protect and enhance water quality within the Chisago Lakes watershed.
- Maintain the ditch and weir system to control water levels during high water events.
- Encourage environmentally sound land use practices for urban and agricultural areas to protect water quality within the Chisago Lakes watershed.
- Restore, improve and maintain navigation channels between the lakes.
- Protect, encourage and restore native shoreline to improve fish and wildlife habitat.
- Promote environmental education, awareness and stewardship within the Chisago Lakes watershed.
- Promote the reduction of non-native aquatic invasive species.

This Annual Report will outline the LID's goals and highlight any projects and actions that have occurred in 2010 to reflect the attainment of the goals expressed above, and within the Chisago Lakes Lake Improvement District Water Resource Management Plan (Appendix B).

**Goal 1: Preserve, protect and enhance water quality within the Chisago Lakes watershed.**

**Objective 1:** Complete the Chisago Lakes Total Maximum Daily Load (TMDL) study and implement recommended projects and practices.

**\*\*A Total Maximum Daily Load (TMDL) is a regulatory term in the U.S. Clean Water Act (CWA), describing a value of the maximum amount of a pollutant, such as phosphorus, that a body of water can receive while still meeting water quality standards. The final step in a TMDL study is to implement source reduction of the pollutant(s) entering a body of water. A TMDL study/project typically requires 3-4 years to complete. Currently, there are five lakes in the Chisago Area that are listed as Impaired Waters by the Minnesota Pollution Control Agency (MPCA) because of excess nutrient levels - primarily phosphorus, the nutrient that turns the lakes green with algae. The impaired lakes are Kroon, North Center, School, South Center and Wallmark Lakes. An impaired lake requires a TMDL study.**

▪ Chisago Lakes TMDL Study

In conjunction with the Chisago Soil and Water Conservation District (SWCD), the LID began work on the Chisago Lakes TMDL Study in 2008. To date, four of thirteen tasks have been completed for the Chisago Lakes TMDL Study. These included gathering data, outreach and participation, land use assessment, and the development of a water monitoring plan. Water monitoring to support the TMDL study has been in place for two years. A contract between the Chisago SWCD and the Minnesota Pollution Control Agency (MPCA) for \$196,600 was executed on September 29, 2010. The funds from the contract will be used to complete the remaining tasks of the Chisago Lakes TMDL Study which include a nutrient loading and turbidity assessment, evaluation of water quality data, TMDL modeling, implementation strategies, effectiveness monitoring, excess nutrient and turbidity TMDL project reports, draft and final TMDL report, and a public fact sheet.



School Lake – listed as an MPCA Impaired Water

**Objective 2:** Develop, calibrate, validate and run scenarios with a Soil and Water Assessment Tool (SWAT) model to gain understanding of nutrient and sediment movement within the Chisago Lakes watershed. The Chisago Lakes SWAT model will be consistent with the Sunrise River and St. Croix River SWAT models.

**\*\*A Soil and Water Assessment Tool (SWAT) is a hydrology model that uses GIS computer simulation to measure the impact of human development and land management practices within a watershed.**

- The LID owns a partially completed SWAT model. It has yet to be calibrated and validated; funds were not allotted for this objective in 2010.

**Objective 3:** Monitor nutrients, aquatic life and other parameters to determine water quality concentration trends and loading.

- The Chisago SWCD completed a monitoring plan for the LID in 2010. Chisago SWCD performed monitoring at 17 sites. Ten of the sites were lake monitoring sites, and the remaining seven were tributary monitoring sites. A map of the 2010 monitoring sites is included in Appendix D. The LID paid the SWCD \$16,730.00 for their monitoring services in 2010. A map of monitoring locations is included in Appendix C.

**Objective 4:** Establish a program to annually monitor and assess the water quality of the lakes within the Chisago Lakes watershed. The resultant report will provide information about lake water quality and interpretation of trends in the quality.

- The Chisago SWCD coordinated the water quality monitoring within the Chisago Lakes watershed. A report summarizing the 2009 and 2010 water quality data will be produced by the SWCD in 2011.

**Objective 5:** Create and approve a map delineating the boundaries of the Chisago Lakes watershed showing the connections to the Sunrise River.

- This objective was met in 2008 when the Chisago SWCD created the current Chisago Lakes watershed boundary map. It is attached as Appendix A.

**Objective 6:** Partner with local communities in the effort to connect areas of high density, unsewered, undersized, riparian lots to centralized sewer systems.

- The LID budgeted \$30,000 within its 2010 budget to assist the City of Lindstrom in the sewerage of Glader Lane, Glader Boulevard, Lakelawn Drive and Minnesota Avenue. The LID is providing a grant of \$500 per new sewer hook-up to homeowners who are choosing to discontinue use of an existing

septic system, and upgrade to the new city sewer system. Upgrading to the city sewer system will improve the water quality of South Center Lake, Kroon Lake and North Lindstrom Lake. The LID is offering this grant money through 2011, and cannot commit to additional future funding at this time. Three homeowners upgraded their septic systems and took advantage of the \$500 grant in 2010. A copy of the homeowner grant application is included in Appendix D.

**Goal 2: Maintain the ditch and weir system to control water levels during high water events.**

**Objective 1:** Develop and implement a plan to maintain the high water level control system, including weirs and channels.

- Maintenance on the weirs and channels must follow the 2005 Emergency Management Plan for the Chisago Lakes Outlet Project, developed by previous LID engineer, HDR, Inc. (Appendix E)
- Weekly lake level monitoring was completed from April to November. Lake levels were submitted to the Chisago County Press on a weekly basis. A total of 13 lakes were monitored in 2010. See Appendix F for 2010 lake level information.

**Objective 2:** Perform periodic inspections and maintenance of the lake system channels and overflow weirs. Coordinate and initiate brush/debris clearing activities.

- The channels in the system receive regular maintenance according to the Emergency Management Plan for the Chisago Lakes Outlet Project. Inspections were completed on May 21, 2010 and September 29, 2010. Copies of the maintenance memos from LID contracted engineer, Emmons & Olivier Resources, Inc. (EOR), are included in Appendix G.

**Objective 3:** Provide engineering services for planned maintenance of the drainage system. This requires hydraulic design, surveying of drainage system, scheduling maintenance crews, and inspecting maintenance work.

- In 2010 the LID underwent a Request for Proposal process to hire a firm to provide engineering services through a contract expiring December 2011. A total of eight proposals were received; in April 2010, the LID Board chose Emmons & Olivier Resources, Inc. (EOR) as the firm to provide engineering services to the LID.
- Several issues within the drainage system were repaired in 2010. These included removing beaver dams; removing fallen branches and debris from within the channels; repairing erosion at the mouth of the channel entering

Chisago Lake at Paradise Park; rearranging rip rap at the box culvert outlet just north of Highway 8 within the Chisago to Wallmark Channel; removing branches from within the overflow weir in the channel from Chisago to Green Lake; conducting maintenance on the Lake Ellen Weir and the Lofton Avenue weir to ensure proper operation; installing a safe access ramp at the Lake Ellen weir; and attempting a televised pipe inspection within the underground pipe from Lake Ellen to Swamp Lake outlet (unable to complete due to high water level in the pipe).



Excavation of overgrowth around Lake Ellen weir structure  
April 2010

**Objective 4:** Proceed with actions to purchase and acquire property from landowners located south of County Road 19 and east of Ivywood Trail in an upstream direction at a fair price for the two-foot freeboard boundary.

- The LID is receiving assistance on this objective from the Chisago County Attorney's office. The LID Board accepted a cost proposal from SRF Consulting Group, Inc. in December 2009 to complete flowage easement acquisitions for the 28 parcels located south of County Road 19 and east of Ivywood Trail.

**Goal 3: Encourage environmentally sound land use practices for urban and agricultural areas to protect water quality within the Chisago Lakes watershed.**

**Objective 1:** Work cooperatively with local units of government, including Chisago County, in the process of evaluating, proposing, adopting, and promoting Stormwater (and erosion control) Management Standards targeted to the specific needs of individual communities. The LID will draft a preliminary recommended, updated model stormwater erosion ordinance.

- A draft model ordinance has been completed by HDR, Inc. for the LID. Motions of support have been received by Center City, Chisago City and Lindstrom. No additional work was done on this objective in 2010.

**Objective 2:** Create a map of stormwater runoff systems within the Chisago Lakes watershed and develop a system to prioritize stormwater infiltration projects.

- Chisago SWCD completed the City of Lindstrom: Stormwater Retrofit Assessment report which includes a comprehensive map of the stormwater runoff system within the City of Lindstrom. Center City and Chisago City will also be receiving a similar report and stormwater runoff system investigation.

**Objective 3:** Establish a matching fund to provide incentives for local units of government (cities, townships, county), schools and private landowners within the Chisago Lakes watershed to design and install Best Management Practices for infiltration and volume reduction controls of stormwater runoff. This fund would be for retrofitting existing conditions, and would not be used to mitigate stormwater control problems generated by future development activities.

- Lakeside Elementary School Stormwater Retrofit Project  
Starting in 2009, the LID helped fund a stormwater retrofit project at Lakeside Elementary School in Chisago City. The project included the installation of 9,500 square feet of rain gardens, and a gully stabilization area. The rain gardens were installed in 2009, and the gully area was stabilized in July 2010. The gully area will now be better able to handle stormwater runoff, without creating erosion which carried sediment and nutrients into Green Lake. The cost share portion from the LID for the gully stabilization area was \$3,957.00.



View looking down into the gully, towards Green Lake. Rocks were placed at the base of the gully to diminish bottom erosion; straw and netting were placed on the slope of the gully to encourage seed establishment.



- Government Center Retrofit Stormwater Separator

The LID partnered with Center City in September 2010 to install a stormwater separator sump adjacent to the parking lot of the Chisago County Government Center. The stormwater separator sump will help filter sediment out of the stormwater traveling across the parking lot, thus inhibiting solids from entering North Center Lake. The LID slated up to \$10,000 to assist in this project.



Installation of the stormwater separator—southeast corner of the Government Center parking lot

- Stormwater Retrofit Assessment

The LID partnered with the SWCD in 2010 to begin a Stormwater Retrofit Assessment project. The goal of the project is to identify where to best install best management practices to obtain the best ‘bang for the buck’ in phosphorus reduction within stormwater. When excess phosphorus gets into water, algae blooms can result. As algae die and decay, oxygen in the water is depleted and water quality declines. Therefore, reducing the phosphorus content in stormwater will aid in reducing the level of phosphorus that enters our area lakes.

Chisago SWCD prepared a report titled City of Lindstrom: Stormwater Retrofit Assessment. The report is considered to be one part of a holistic approach to installing best management practices (BMPs) throughout the Chisago Lakes Watershed. During the assessment, the City of Lindstrom was divided into 52 catchments, or areas of stormwater collection. Sixteen of these catchments were modeled at various levels of stormwater treatment. The LID has partnered with the City of Lindstrom to decide which catchments to prioritize for the installation of BMPs in 2011.



A map of the fifty-two catchment areas identified within the City of Lindstrom for the Stormwater Retrofit Assessment report.

A Stormwater Retrofit Assessment will also be completed for Center City and Chisago City in 2011.

**Objective 4:** Promote the installation of agricultural best management practices that will reduce sediment and pollutant loading (fertilizers, pesticides and animal waste runoff) to improve the water quality within the Chisago Lakes watershed.

- Reducing sediment and pollutant loading within agricultural landscapes was a topic discussed at the August 19, 2010 NEMO landscape tour workshop. Participants of the workshop were taken to a local farm where SWCD staff pointed out agricultural best management practices that were put in place, along with their benefits. A more detailed summary of the LID's work with NEMO can be found within Goal 7, Objective 2 (page 12).

**\*\*NEMO (Nonpoint Education for Municipal Officials)** is a nationally recognized educational program for local elected and appointed decision makers addressing the relationship between land use and natural resource protection. The mission of NEMO is to help communities better protect natural resources while accommodating growth and redevelopment.



NEMO Workshop participants at the Steve and Chris Wadell Farmstead in North Chisago Lakes Township.



Craig Mell, Chisago Soil & Water Conservation District, discussing the importance of buffer strips along farm fields.

#### **Goal 4: Support safe and balanced recreational use of surface water.**

**Objective 1:** Make recommendations to the Chisago County Board on development of a code of rules to regulate surface water use – provide fair balance between competing lake related interests.

- The LID has a working relationship with the Chisago County Sheriff Water Patrol. Sheriff Water Patrol Officer, Sgt. Mary McCarthy attends monthly LID meetings to discuss concerns of wake zones and water travel speed.

#### **Goal 5: Restore, improve and maintain navigation channels between the lakes: Big Green/Little Green, South Center/North Center, North Center/North Lindstrom, North Lindstrom/South Lindstrom**

**Objective 1:** Provide engineering services to evaluate easement needs, survey easements, and draw up easement plans.

- The LID has worked with Hansen, Thorp, Pellinen, Olson, Inc. (HTPO) to further assist in the title work of the necessary easements for a possible channel between North Center Lake and North Lindstrom Lake.

**Objective 2:** Complete acquisition of easements: including downstream from Lake Ellen, outlet from North Center into channel to North Lindstrom, downstream from Wallmark Lake, and between Chisago Lake and Chisago County 83.

- Kristine Fuge, Assistant County Attorney, is assisting the LID in this project. Many easements have been acquired. There are few easements that remain to be acquired.

**Objective 3:** Remove debris and accumulated sediments in navigation channels, particularly the channel between Green and Little Green Lakes.

- The channel between Green Lake and Little Green Lake was straightened and dredged in 2009. Channels are inspected on a regular basis to determine the need for debris and sediment removal.

**Objective 4:** Design a navigable channel between North Lindstrom and North Center lakes

- Easements are currently being acquired for this navigable channel. Once easements are acquired, design activities can begin.

**Objective 5:** Facilitate the reconstruction of the bridge at CSAH 20 and the restoration of a navigable channel between North Lindstrom and North Center lakes.

- The LID has allocated \$20,000 in 2011 to aid in the planning and design of a new bridge at CSAH 20 in cooperation with the County Highway Department.

**Goal 6: Protect, encourage and restore native shoreline to improve fish and wildlife habitat.**

**Objective 1:** Educate and encourage lakeshore owners to preserve and restore native vegetation and buffer strips.

- The NEMO Workshops on May 12<sup>th</sup> and August 19<sup>th</sup> discussed native shorelines with participants. In addition, beginning in 2011, the LID has partnered with the Chisago SWCD to provide education and technical assistance to lakeshore owners wishing to preserve and restore their shorelines.

**Goal 7: Promote environmental education, awareness and stewardship within the Chisago Lakes watershed.**

An Education Specialist position was created in July 2009 by expanding the current LID administration position of Mary Christopherson to include education and outreach responsibilities.

**Objective 1:** Promote participation by Lakeside Elementary students in the annual Chisago County Children's Water Festival.

- Children's Water Festival  
The Chisago County Children's Water Festival was held on September 24, 2010 at Ojiketa Regional Park in Chisago City. Approximately 750 fifth grade students attended the festival from Chisago County. There were 27 stations for students to learn many different aspects of water resource education. Mary Christopherson, LID Education Specialist, staffed a station titled Raging Run-off. The children were taught how activities on four different types of

landscapes can cause erosion and harm our lakes and waters. The LID contributed \$500 toward this educational festival.



Students learning about fish at the Children's Water Festival

**Objective 2:** Promote water resource education by collaborating with organizations such as the East Metro Water Education Program, Metro Watershed Partners, Project NEMO (Nonpoint source pollution Education for Municipal Officials), Blue Thumb, and PICKM water quality educators.

- Mary Christopherson attended a Pine, Isanti, Chisago, Kanabec, Mille Lacs (PICKM) watershed team meeting in August, as well as the Putting the Pieces Together guided tour of the St. Croix Valley's land and water resources.

**\*\*The PICKM Water Quality team includes representatives from Pine, Isanti, Chisago, Kanabec and Mille Lacs counties that work together to sponsor workshops and other educational programs intended to help citizens and governments make wise decisions about water resources.**

- In addition, the LID began collaborating with NEMO in 2010 and hosted two educational workshops for local decision makers. The first workshop was held on May 12, 2010 and was titled: Chisago Area Lakes Spring Check Up. A total of 39 participants attended the workshop. Participants included local mayors, members from local park boards, planning commissions, lake associations, and city councils from the surrounding communities of Lindstrom, Center City and Chisago City.

## Photos from the Chisago Area Lakes Spring Check Up NEMO Workshop



Mike Mueller, Area DNR Hydologist, discussing the definition of a watershed.



Jerry Spetzman, Water Resource Manager, facilitating the Watershed Game, Lake Version.

The second NEMO workshop was held on August 19, 2010 and was titled: Lessons Across the Landscape. A total of 29 participants were taken across the Chisago Lakes watershed on a bus tour to learn about how our actions on the land affect our area lakes. There were four stops on the tour. The stops highlighted the following issues: Bioretention (Rain Gardens)/Gully Stabilization, Water Quality, Urban Runoff and Rural Runoff. Participant surveys included positive feedback as well as concerns on how to implement what was observed.

## Photos from the Lessons Across the Landscape NEMO Workshop



Jerry Spetzman, Water Resource Manager, demonstrates a secchi disk reading in water taken from Wallmark Lake.



Participants learned how erosion from various landscapes can create different run-off scenarios.

- The LID also participated in the Classroom Rain Barrel Decoration Contest on December 17, 2010. The Chisago Soil and Water Conservation District was awarded a grant through East Central Energy's Operation Round Up program to host a classroom rain barrel decoration contest for schools in Chisago County. Nineteen rain barrels were decorated by students in grades 4-12 from

six different schools. Mary Christopherson, LID Education Specialist, was one of the judges for the contest.



An excerpt of the rain barrels decorated by students – great creativity!

**Objective 3:** Provide an opportunity, at least once yearly, for county, city, township officials and planning commissions to receive education on how their land use decisions have a direct impact on non-point runoff pollution.

- The two NEMO workshops mentioned previously in Goal 7, Objective 2 provided two opportunities for education directed at county, city, township officials and planning commissions.

**Objective 4:** Promote public outreach and awareness of the various LID programs.

- Chisago Lakes Home and Garden Show  
The Annual Chisago Lakes Home and Garden Show was held on February 28<sup>th</sup> and March 1<sup>st</sup>. LID Board members staffed a booth, provided informational literature and discussed concerns with citizens.
- Articles were included in the Spring and Fall Environmental Connections newsletters. This publication is produced by Chisago County and distributed to all households within the county. The Spring article discussed how best to clean up residential yards and yard waste in preparation for spring rains. The Fall article highlighted the Spring NEMO Workshop – Chisago Area Lakes Spring Check-Up.
- The LID continues to contribute copies of reports which are shelved at the Chisago Lakes public library.
- Each month a summary of the previous regular LID meeting is published in the Chisago County Press.

**Objective 5:** Develop and maintain a web site which provides information and education on LID activities for residents.

- The LID posts information on the Chisago County Environmental Services webpage. LID monthly meeting minutes, agendas, reports and area lake levels can be found at this location; in the future it will include resources for lakeshore management, weeds, and other pertinent lake issues.

**Goal 8: Promote the reduction or control of non-native aquatic invasive species.**

**Objective 1:** When appropriate, provide contingency funds to cover costs associated with special lake association requests for treatment of non-native aquatic invasive species.

- The LID is investigating a DNR grant opportunity regarding the treatment of aquatic invasive species in lakes.
- The LID hosted a meeting on September 20, 2010 to help educate the public on invasive species. Brittany Hummel, DNR Aquatic Invasive Species Specialist, gave a presentation on the aquatic invasive species found in the Chisago Chain of Lakes, as well as what other Minnesota lakes have tried for treatment options.



Invasive species presentation from DNR, hosted by the LID.

**Objective 2:** Partner with the Minnesota Department of Natural Resources on watercraft inspections at boat landings.

- The LID partnered with Comfort Lake-Forest Lake Watershed District and the DNR on aquatic invasive species prevention by hiring DNR interns to



complete watercraft inspections at rotating boat landings in the 2010 summer season. The intern was also available to answer questions from concerned boaters.

**Objective 3:** Partner with other organizations researching new methods to control non-native aquatic invasive species such as iron augmentation of lake sediment to control curly leaf pondweed.

- The LID has obtained information regarding Rush Lake Association's attempts to bind phosphorus using iron filings which has the side benefit of reducing the density of curly leaf pondweed.

### **Financial Summary**

The Chisago Lakes Lake Improvement District budget for 2010 was \$258,453. The LID is responsible for ensuring that these monies are spent to better the overall quality of the lakes and watershed of the District. The LID budget originates from an ad valorem tax on all property owners within the Chisago Lakes watershed. A copy of the 2010 budget can be found in Appendix H.

## Conclusion

The LID had a productive 2010. The major projects completed in 2010 include the two NEMO educational workshops, weekly lake level monitoring, and the Subwatershed Assessment project in Lindstrom. In addition, several channel and weir system maintenance issues were completed in 2010. It is very beneficial that the Chisago SWCD was able to secure funding in 2010 from the MPCA to allow for continued work on the Total Maximum Daily Load study for the Chisago Lakes Watershed. The LID has also put plans in place to complete Subwatershed Assessments for Chisago City and Center City in 2011; and complete select BMP projects identified from the 2010 Subwatershed Assessment project in Lindstrom with the goal of improving the health and quality of our lakes. The LID looks forward to continuing its efforts to protecting and restoring the surface water resources of the Chisago Lakes watershed in 2011.



Beaver observed inside the Lake Ellen weir – since removed.