

**WATER QUALITY MANAGEMENT ACTIVITIES BEING UNDERTAKEN
WITHIN THE CITY OF CIRCLE PINES**

(A summary of the report given by Pete Willenbring of WSB Engineering
to the Circle Pines City Council on October 14, 2008)

History of Water Quality Management Within the City of Circle Pines

Over the past 30+ years, the City of Circle Pines has been actively working to protect the quality of water within the City. The focus of these actions has been to protect the quality of water within Golden Lake and numerous projects have been constructed for this purpose since the 1970s.

In 1982, a diagnostic feasibility study was completed by the City and funded by the US Environmental Protection Agency, MPCA, Rice Creek Watershed District, and the City of Circle Pines for the purpose of determining how to best manage and improve the quality of water in Golden Lake. The study indicated many options were available to improve the lake's quality and a biomanipulation project was undertaken, along with the installation of an aerator. The aerator is currently being operated by the City at this time.

In the 1990s a project was constructed upstream of Golden Lake entitled "The Golden Lake Wetland Treatment System Project." This project constructed a large stormwater treatment pond upstream of Golden Lake for the purpose of removing pollutants from water directed into this basin prior to its discharge into Golden Lake. This system is currently being utilized to continually protect the quality of water within Golden Lake.

In 2003, a Water Quality Management Plan for Golden Lake was prepared by the Golden Lake Water Quality Task Force, a group of Circle Pines residents, citizens, and City Council representatives interested in improving the lake's water quality, reducing the rooted aquatic plant infestation, and enhancing the lake as a fishery. After reviewing the various issues, concerns, and complaints that were brought to the attention of the City Council, they developed improvement goals for the lake. The goals were identified as follows:

- **Improve Water Quality**

Water quality goals relating to phosphorus concentrations, chlorophyll a concentrations, and transparency were established. These goals are generally met in the early spring and fall of the year, but are typically exceeded in late June, July, and August.

- **Manage Excessive Growth of Rooted Aquatic Plants**

Rooted aquatic plants continue to be an issue within the lake and no specific improvements have been undertaken to address this problem up to this time.

- **Manage Lake For Fishing Purposes**

The City operates an aeration system for the lake in an attempt to maintain healthy populations of desirable fish species. Efforts, to date, to limit undesirable fish species have had some success.

The Water Quality Task Force identified a number of options that, if implemented, could work toward meeting the improvement goals identified. The attached Table 1 provides a description of the potential options and their associated cost.

In the past few years, Golden Lake has been identified as an impaired water by the MPCA, which requires the MPCA to prepare a plan that would allow for the lake to be improved to the extent that it would be removed from the Impaired Waters List. This plan, referred to as a Total Maximum Daily Load Plan, is currently drafted and is being reviewed by the US EPA. The current draft may require the City to remove 10-15 lbs. of phosphorus per year from discharges directed into the lake. The plan would also require the City of Blaine to reduce loadings to Golden Lake by a significantly greater amount.

Projects That Have Been Recently Completed to Protect the Quality of Water Within Golden Lake

A number of projects have been recently completed or are in the process of being completed, and are anticipated to significantly reduce the pollutant loading to Golden Lake and improve its water quality. They include the following:

1. Removal of sediment at the County Ditch 53/62 inlet into Golden Lake.
2. Implementation of a Water Quality/Wetland Management Plan within the City of Blaine.
3. Construction of stormwater improvements as part of the West Golden Lake Road reconstruction project that reduces the pollutant loading and stormwater runoff volume carried by the storm sewer from the roadway into Golden Lake.
4. Maintenance of stormwater quality management ponds in four selected areas within the City of Circle Pines.
5. The implementation of a demonstration project being undertaken jointly between the City of Circle Pines and the Rice Creek Watershed District that will evaluate the viability of constructing an active water quality treatment system upstream of Golden Lake for the purpose of cleaning up the water prior to its discharge into Golden Lake.
6. Develop and implement a future plan that would improve the quality of water in Golden Lake to the extent necessary to remove the lake from the State of Minnesota's Impaired Water List.

The City of Circle Pines anticipates working cooperatively with the Rice Creek Watershed District and the Minnesota Pollution Control Agency to improve the water quality within Golden Lake by implementing projects throughout the watershed.

Where Do We Go From Here?

The City of Circle Pines anticipates continuing to implement the improvements identified in its Water Quality Management Plan, potentially incorporating additional projects to meet the requirements of the MPCA in an effort to remove the lake from its impaired waters list, and also implement other improvements that are deemed reasonable as the City undertakes future street reconstruction projects.

TABLE 1
COSTS AND POTENTIAL BENEFITS ASSOCIATED WITH OPTIONS
 (Source: Water Quality Management Plan for Golden Lake
 prepared in 2003 by the Golden Lake Water Quality Task Force)

Option No.	Description of Proposed Improvement	Estimate of Cost	Potential Benefit		
			Water Quality	Aquatic Plant Control	Fisheries Management
1	Alum or Ferric Chloride Treatment Upstream	\$200,000-400,000	High	Low/Possible Negative Impact	Low
2	Alum or Ferric Chloride Treatment In-lake	\$30,000 per treatment	High	Low/Possible Negative Impact	Low
3	Lake Level Drawdown in Winter	\$50,000-100,000 less in future yrs.	High	High	High/Medium/Low
4	Lake Level Drawdown, Dredging, Scraping, and Sediment Delta Removal	\$600,000-1,500,000	High	High	High/Medium/Low
5	Biomaniipulation	\$50,000-200,000	Medium	Medium	High
6	Diversion	\$450,000-700,000	High	Low	Low
7	Treatment Enhancements Upstream of I 35W	\$150,000-250,000	Medium	Low	Low
8	Weed Harvesting	\$40,000 annually	Low	High	Low
9	Herbicide Treatment of Rooted Aquatics	\$2,000-5,000 annually	Low	High	Low
10	Phosphorus Control Ordinance in Upstream Watershed	\$0	Low	Low	Low
11	Expansion of Upstream Wetland Treatment System	\$200,000-400,000	Low	Low	Low
12	Hypolimnetic Withdrawal	\$100,000	Low/Medium	Low	Low
13	Expanded Aeration System	\$200,000-300,000	Low	Low	Medium
14	Expanded NPS Watershed Management Measures in Direct Watershed	\$150,000-200,000	Low	Low	Low
15	Fish Stocking	DNR Funded	Low	Low	High