6.0 Conclusions

Examination of available water quality monitoring data indicate that Wood Pond currently does not consistently meet the City's summer-average Secchi disc transparency goal of 1.7 meters, which was set forth in their 2002 *Water Resources Management Plan*.

Historic water quality monitoring data indicates that Wood Pond has consistently met the MPCA's shallow lakes criteria for Secchi disc transparency and total phosphorus, with exception of the 2006 summer-average total phosphorus concentration. Wood Pond generally meets the MPCA's shallow lakes criteria for chlorophyll *a*, with exceedances in 3 of the 12 years with monitoring data.

To improve the water quality of Wood Pond and prevent further degradation, implementation of BMPs in the Wood Pond watershed is recommended. Feasible management options have been identified in this UAA that would provide treatment of stormwater and allow the lake to meet the City's and the MPCA's water quality goal for Wood Pond. Additionally, the reduction in total phosphorus to the lake due to nonstructural BMPs may also assist in reaching the City's goal.

The following summary describes the main conclusions of this study that allowed for a diagnosis of the water quality issues in Wood Pond and identification of activities and projects that would help the lake meet its water quality goal in the future.

1. The historic water quality data collected from Wood Pond, including an intensive water quality monitoring program during 2007, were generally indicative of eutrophic (i.e., nutrient-rich) conditions during the summer, with some time periods being within the hypereutrophic classification. Summer algal blooms throughout the summer months, caused by elevated phosphorus concentrations, can interfere with recreational use of Wood Pond. The largest contributors to the high summer phosphorus concentrations in Wood Pond are watershed runoff and phosphorus recycle (i.e., internal load) from the lake's sediments.

2. Because the Wood Pond watershed is considered fully developed, with little or no change in land use expected, watershed phosphorus loading to Wood Pond will not likely change significantly in the future without implementation of stormwater BMPs.

3. The presence of nuisance-level macrophytes has not historically been a problem in Wood Pond. In general, the aquatic plants in Wood Pond are limited to the area along the perimeter of the lake (approximately 10 to 20 feet from the shoreline). During the June 2007

macrophyte survey, Narrowleaf pondweed and Slender Naiad were the most prevalent submerged aquatic plants. Curlyleaf pondweed was also observed at light to moderate densities. The August 2007 survey indicated that Slender Naiad was present at nuisance levels along the perimeter of the lake. Anecdotal evidence from local residents indicates that macrophtye populations were denser in 2007 than previously observed. To track future trends in macrophyte populations, it is recommended that annual or biannual macrophyte surveys be continued for Wood Pond.

4. Water quality modeling conducted for the calibration year (2006-2007) indicated that a significant portion (about 21 percent) of the annual total phosphorus load to Wood Pond is from Subwatershed WP-1. Runoff from this drainage district, which is primarily medium-density residential land use, is primarily untreated prior to being discharged into Wood Pond. Construction of a regional water quality pond, located on city-owned property on the north side of Wood Pond, was evaluated to determine the impact of treating runoff from the WP-1 subwatershed (Figure 6-1). Modeling results indicate that this pond would have a beneficial effect on the summer-average total phosphorus concentration in Wood Pond. As a result of this analysis, the construction of a wet detention pond to treat runoff from Subwatershed WP-1 was deemed cost effective, and is recommended for implementation.

5. Water quality modeling conducted for the calibration year (2006-2007) indicated that a significant portion (about 32 percent) of the annual total phosphorus load to Wood Pond is from Subwatershed WP-3. Runoff from this subwatershed, which is primarily commercial, medium density residential and right-of-way land use, is untreated prior to being discharged into Wood Pond. Due to the availability of land, topography, and the depth of the existing storm sewer system in the subwatershed, installation of a regional treatment system (wet detention pond or infiltration basin) was prohibited. Alternatively, construction of an infiltration basin (rainwater garden) to treat runoff from a portion of the subwatershed (4.2 acres of residential and right-of-way property) was evaluated to determine the improvements in Wood Pond water quality (Figure 6-1). Modeling results indicate that this infiltration basin would improve the summer-average total phosphorus concentration in Wood Pond. As a result of this analysis, the construction of an infiltration basin (rainwater garden) to treat runoff from a residential portion of Subwatershed WP-3 was deemed cost effective, and is recommended for implementation.

6. Water quality modeling conducted for the calibration year (2006-2007) indicated that approximately 5 percent of the annual total phosphorus load to Wood Pond is from Subwatershed WP-4. Runoff from this subwatershed, which is primarily residential land use, is untreated prior to being discharged into Wood Pond. Construction of a subsurface infiltration system to treat runoff from the WP-4 subwatershed was evaluated. The proposed subsurface infiltration site is located beneath 145th Street in subwatershed WP-4, at the low-area where the existing storm sewer system picks up runoff through several catchbasins (Figure 6-1). Modeling results indicate that this infiltration basin would improve the summer-average total phosphorus concentration in Wood Pond. As a result of this analysis, the construction of a subsurface infiltration system to treat runoff from Subwatershed WP-4 was deemed cost effective, and is recommended for implementation.

7. Water quality modeling simulations conducted in this UAA indicate that sediment-released phosphorus can affect the water quality in Wood Pond under certain climatic conditions (typically during dry periods), contributing up to 58 percent of the lake's summer-average phosphorus concentration in the modeled "dry" year. To minimize this source of phosphorus to the lake, an alum treatment of Wood Pond's sediments is recommended for implementation. Information obtained from analysis of sediment cores from Wood Pond will be used to determine an alum dosing rate that will maximize the effectiveness and longevity of the alum treatment.

8. While BMPs recommended in this Plan will serve to decrease total suspended solids and phosphorus loads to Wood Pond, additional nonstructural BMPs should be implemented to protect and improve the water quality in the lae and ensure that the City's water quality goal is consistently met.

9. If all of the recommended BMPs are pursued, Wood Pond's water quality is likely to meet the City's Secchi disc transparency goal of 1.7 meters in most years.

10. If all of the recommended BMPs are pursued, Wood Pond's water quality would likely meet the MPCA's eutrophication standards for shallow lakes.

Barr Footer: Date: 7/9/2008 5:55:34 PM File: I:\Projects\23\19\A24\GIS\Maps\Figure_6-1_Locations of Recommended BMP.mxd User: sgw

Storm Sewer

Existing Subwatersheds

Parcels

Proposed Best Management Practices

Water Quality Pond

Infiltration

Subsurface Infiltration

0 500 1,000

Feet

Figure 6-1

WOOD POND WATERSHED
LOCATIONS OF RECOMMENDED
BEST MANAGEMENT PRACTICES

Wood Pond Use
Attainability Analysis
City of Burnsville
Burnsville, Minnesota