A Use Attainability Analysis (UAA) is a scientific assessment of a water body’s physical, chemical, and biological conditions. This assessment provides the foundation for a lake-specific best management practices (BMPs) plan that is used to maintain or attain the existing and potential beneficial uses of a lake, such as swimming, fishing, or aesthetic viewing.

Goals for Birch Island Lake

Nine Mile Creek Watershed District

Water Quality Goal:

Maintain Level II Classification—full support of swimmable use, but threatened.

Investigative Techniques

The Birch Island Lake UAA includes both a water quality analysis and prescription of protective measures for Birch Island Lake and its watershed. This analysis and prescription is based on:

- Historical water quality data
- Intensive lakewater quality study
- P8 computer simulation modeling of runoff water quality
- Lake hydrologic and phosphorus budget analyses (see below)
- Best management practices (BMPs) analysis

This graph illustrates Birch Island Lake's historic and predicted future summer-average water clarity (transparency). Transparency is measured as the depth at which a black-and-white patterned disc (a Secchi disc) disappears from view as it is lowered into the water.

Surface water runoff from Birch Island Lake's watershed contributes roughly 59 percent of the lake’s annual phosphorus load.

The land use on a lake’s watershed directly impacts the water quality in the lake. Therefore, the Birch Island Lake UAA assessed existing and ultimate watershed land-use conditions. The Birch Island watershed is dominated by low-density residential land use.
Water Quality Problems

- **Recreational Issues**
  Problem: Summer algal blooms (caused by high phosphorus levels)
  Cause: Urban stormwater runoff conveying large amounts of phosphorus to the lake

- **Biological Issues**
  Problem: Exotic lake weed species (see below)
  Cause: Purple loosestrife

Purple loosestrife is an exotic species that invades wetlands and lake shorelines. It outcompetes native species and, if left unchecked, will eventually become the dominant plant wherever it appears. Purple loosestrife not only displaces native plants, but also diminishes wetland habitat value for a variety of native animals.

**Recommended Remedial Measures***

**Conventional Runoff BMP**—Three improvements are recommended for Birch Island Lake’s watershed, including:

- One new stormwater treatment/detention pond (Pond BIL4-1) will allow the district’s Level II classification to be attained or maintained for average, wet, and model calibration climatic conditions. It will also reduce the annual phosphorus load between 18 and 45 percent and improve the Secchi disc transparency by up to 40 percent, to between 0.7 and 1.8 meters, depending on the climatic condition.

- Improvement of an existing runoff detention pond (BIL8) south of Birch Island Lake, along Lesley Lane. This basin is proposed to have a surface area of about 0.28 acres and a water quality storage volume below the normal water level of roughly 1.15 acre-feet.

- Construction of a pipe bypass system to convey groundwater and surface water runoff from north of CSAH 62 directly to Birch Island Lake to restore the lake’s historic hydrology. The recommended approach is to bypass the roadway embankment with both surface and groundwater flow.

**Biological Management**—The district will continue macrophyte (aquatic plant) surveys to monitor the growth of exotic plant species (purple loosestrife).

*Implementation of remedial measures may change based on municipal petitions.*