

Water quality standards and beneficial uses are described as well as applicable narrative criteria. A phase 1 numeric expression for total phosphorus delivery to the lake is provided, is site specific to the watershed, and is described using lake sediment core analysis for estimating historic phosphorus concentrations through the diatom composition of the sediments. A Phase 2 surrogate measure is also identified as a fully supporting Class B aquatic life use which will be determined in accordance with the Statewide Biological Sampling Plan protocol.

Link Between Numeric Target(s) and Pollutant(s) of concern

An explanation and analytical basis for expressing the TMDL through surrogate measures (e.g., parameters such as percent fines and turbidity for sediment impairments, or chlorophyll-a and phosphorus loadings for excess algae) is provided, if applicable. For each identified pollutant, the submittal describes analytical basis for conclusions, allocations and margin of safety that do not exceed the load capacity.

Excess nutrients have caused algal blooms, and organic enrichment, resulting in severe oxygen depletions in the lake; this has also impacted the fish community in which only one species is currently supported and its population is stunted. Long-term water quality data, as well as information regarding the fish community, support the decision to reduce total phosphorus loadings to the lake, and sediment core analysis supports the use of the target load.

Source Analysis

Important assumptions made in developing the TMDL, such as assumed distribution of land use in the watershed, population characteristics, wildlife resources, and other relevant information affecting the characterization of the pollutant of concern and its allocation to sources, are described. Point, non point and background sources of pollutants of concern are described, including magnitude and location of the sources. Submittal demonstrates all significant sources have been considered.

There are no point source contributions of nutrients in the watershed. Non-point source contributions are fully described and include quantification of fertilizer and liquid hog manure application in the watershed and their runoff, and consideration of septic systems and urban stormwater runoff. Non-point source discharges are originating from sheet and rill erosion and overland runoff.

Allocation

Submittal identifies appropriate wasteload allocations for point, and load allocations for nonpoint sources. If no point sources are present the wasteload allocation is zero. If no nonpoint sources are present, the load allocation is zero.

Current phosphorus levels in Silver Lake average around 500-600 ug/L and the loading capacity has been determined to be 100 ug/L. Allocation of total phosphorus was determined using a mass balance equation taking into account the volume of the lake.

WLA Comment

The wasteload allocation is zero.

LA Comment

A load allocation of 60 pounds/year total phosphorus is necessary to reach the in-lake target of 100 ug/L total phosphorus.

Margin of Safety

Submittal describes explicit and/or implicit margin of safety for each pollutant. If the MOS is implicit, the conservative assumptions in the analysis for the MOS are described. If the MOS is explicit, the loadings set aside for the MOS are identified and a rationale for selecting the value for the MOS is provided.

The MOS of safety is implicit based on the the Phase 2 target where the aquatic life use must be restored to the lake in addition to total phosphorus load reductions identified in Phase 1.

Seasonal Variation and Critical Conditions

Submittal describes the method for accounting for seasonal variation and critical conditions in the TMDL(s).

Critical periods of nutrient delivery to the lake are described as occurring during the snow melt runoff period in late winter/early spring, and after periods of high rainfall in the spring and early summer. Since nutrient loading varies substantially by season and between years, and the impacts are felt over multi-year timeframes, a yearly allocation is used.

Public Participation

Submittal describes public notice and public comment opportunity, and explains how the public comments were considered in the final TMDL(s).

Public meetings were held in Des Moines and Delhi on 1/27/01, 2/1/01, and again in Delhi on 10/29/01 to present the final draft TMDL to the public. Copies of the draft TMDL were also posted on the IDNR website for public review.

Monitoring Plan for TMDL(s) Under Phased Approach

The TMDL identifies the monitoring plan that describes the additional data to be collected to determine if the load reductions required by the TMDL lead to attainment of WQS, and a schedule for considering revisions to the TMDL(s) (where phased approach is used).

Bathymetric mapping of the lake will be completed by 2002, and the lake will be monitored three times per year through 2004 as part of the Iowa Lakes Survey. The University of Northern Iowa will also be monitoring water quality in the lake. IDNR Fisheries Bureau will reassess the lake after nutrient reductions in the lake are accomplished and a healthy fish community is sustained.

Reasonable assurance

Reasonable assurance only applies when reduction in nonpoint source loading is required to meet the prescribed waste load allocations.

Reasonable assurances are not required in the TMDL because there are no point sources contributing to the impairment in the watershed.