

**PROJECT MANAGEMENT AND CONSULTATION FOR AN AERATION &
BIOAUGMENTATION RESTORATION PROJECT ON AUSTIN LAKE, PORTAGE, MI**

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Project Costs: \$1,120,000 (Initial 10-year projection); K&A: \$50,000 year 1

Project Completion: January 23, 1996

Austin Lake, located in Portage, Michigan, is a 1,050-acre eutrophic lake. The lake is heavily developed with approximately 500 single-family homes. It is used for numerous recreational activities including swimming, fishing, boating and water skiing. The lake has an average depth of approximately five feet and contains extensive bottom areas dominated by Eurasian watermilfoil and curly leaf pondweed. Lake riparian concerns include shallow lake level, mucky organic sediments covering the majority of the lake bottom and nuisance weed growths.

A proposed ten-year restoration project was undertaken by the Austin Lake Board and the City of Portage to improve the condition of Austin Lake by decreasing sediment thickness and reducing or eliminating nuisance aquatic plant growth by using a combination of aeration and bioaugmentation. This was to be accomplished with aeration units consisting of fully-enclosed polyvinyl curtains with each enclosure covering an approximate sediment surface area of 0.13 acres. Reduction of sediment thickness was to occur within these units.

The first three years of the proposed project were structured to identify the most cost-effective protocols of sediment reduction with the treatment units. This effort was intended to develop a restoration methodology which could double the average water depth in the lake from 5 feet to 10 feet and reduce or eliminate nuisance weeds with aeration/bioaugmentation. Upon development of the optimum protocols, work was to have continued until: 1) the overall lake restoration objectives were met; 2) the year 2005, or 3) available funding was expended.

Kieser & Associates, LLC (K&A) was retained by the Austin Lake Board and the City of Portage as Project Manager and Consultant for the Austin Lake restoration project. Project Manager duties included oversight of the Project Contractor installing and operating the treatment units, review of all project reports and serving as a liaison to the Lake Board. Project Consultant duties included independent verification of the progress and proper operation of the treatment operations, an evaluation of the efficacy of this process and consideration other viable restoration enhancements or alternatives.

K&A efforts on this project included ecological surveys of the lake, determination of sediment thickness on a lake-wide basis, sediment mapping and value engineering. This latter service required specific engineering design recommendations for enhancing the restoration treatment, and a feasibility analysis for its lake-wide application. K&A findings demonstrated that the aeration/bioaugmentation strategy was not suitable for partial or whole lake restoration. Further recommendations included termination of all future efforts on aeration/bioaugmentation saving the riparians and the City of Portage over \$500,000 in additional pilot studies planned for the next two years. Restoration alternatives were also prepared which included innovative dredging and dewatering technologies, use of immediately adjacent lands for dewatering lagoons, water treatment via natural wetlands and costs/cubic meter for sediment removal well below conventionally reported dredging costs. Per our recommendations, the Austin Lake riparians recently formed a Lake Board under the Inland Lake Improvement Act of 1966 to pursue a lake dredging feasibility and improvement study.