

Total Maximum Daily Load Determinations



NRCS-NRDA

Numerous decisions face Total Maximum Daily Load (TMDL) developers. The source and identity of any impairments must be determined. The appropriate model and the best way to apply it must be decided. Proper load capacity and margin of safety must be calculated. And sometimes the greatest obstacle to completing the TMDL is presenting the uncertainties and complexities inherent in determining and implementing the science to stakeholders and the public to gain acceptance and funding.

Watershed stewards seek a TMDL established by someone they can trust. They want a consultant who understands and has successfully negotiated the many elements integral to developing a TMDL. They need a professional who can bring expertise, experience, innovation, and the art of gaining public and regulatory acceptance to the science of creating the right TMDL for their water resource.



LimnoTech staff are experienced in making the many decisions required to generate effective TMDLs.

LimnoTech has been at the forefront of TMDL policy planning and scientific development for more than 20 years. We have assisted EPA, states, local governments, watershed consortia, environmental groups, and NPDES permit holders with TMDL development and use of watershed assessment and modeling to establish fair and effective discharge limits and load allocations.

LimnoTech employs a technical approach to TMDL development that is widely applicable, consistent with data availability, and focused on the technical issues at hand. This technical approach allows LimnoTech to accommodate a wide range of projects, from simple screening-level assessments, to more complex TMDL allocations. In fact, EPA has utilized LimnoTech extensively for TMDL training and on-site technical support for complex TMDLs. LimnoTech has presented these training workshops for all 10 EPA Regions and for several states and watershed groups under EPA technical support contracts. This training covered the federal requirements for the TMDL process, review of available data and data limitations, monitoring, model selection and application, evaluation of control alternatives, and waste load allocations. LimnoTech has also been on EPA's exclusive TMDL Surface Water Assessment Team (SWAT) since 1992. As a member of the SWAT Team, LimnoTech has provided short-term technical consultation on approximately 12 TMDL studies in various states. This support has typically focused on review of data availability, and selection, development, calibration, verification and application of computer models.

LimnoTech has also completed more than 250 technical training sessions in TMDL development for EPA and state regulatory agency staff, performed more than 50 successful TMDLs/TMDL-related projects, and facilitated over a dozen interactive watershed management workshops for mixed stakeholder groups.



LimnoTech has completed more than 50 training sessions in TMDL development for EPA and state regulatory agency staff.

The following project descriptions offer a brief sampling of LimnoTech's experience in helping our clients with projects involving total maximum daily load determinations.

Development of TMDLs for Watersheds in Illinois.

LimnoTech developed 68 EPA-approved TMDLs for waterbodies throughout Illinois for a range of pollutants including bacteria, pH, metals, sediment, nutrients and pesticides. Tasks included data compilation and database development, watershed characterization, source assessment, Quality Assurance Project Plan (QAPP) development, field sampling, modeling, development of TMDLs and implementation plans, and conducting public meetings. LimnoTech evaluated available assessment methods, summarized their applicability and usefulness, and recommended appropriate methods for TMDL development for each watershed. LimnoTech applied multiple models, including QUAL2E, BATHTUB, Load Duration Analysis and GWLF. LimnoTech developed implementation plans for these TMDLs, and led a total of 27 public meetings to present the development of the TMDLs and the implementation plans.



Water Quality Modeling and Regulatory Support for the Third-Party TMDL Revision for the Truckee River, NV.

Water quality in the Truckee River is challenged by low stream flows and competing water demands. LimnoTech is supporting the efforts of several regional agencies in a third-party TMDL revision to improve a 1994 nutrient TMDL. LimnoTech developed a publicly available water quality model, Truckee River HSPF (TRHSPF), to predict occurrences of low dissolved oxygen resulting from nutrients, benthic algae, and low flow. The Truckee River third-party TMDL, funded by the Western Regional Water Commission, has expanded to a broad, basin-wide, stakeholder-based effort and is focused on the development of creative, flexible, and potentially more equitable water quality improvement solutions. It will be structured to allow for modifications to TMDL allocations as improvements such as channel modification from stream restoration or increased flows from improved river management are realized.

Development and Application of Water Quality Model for Lake Pepin, Minnesota TMDL. Lake Pepin is a natural impoundment of the Upper Mississippi River. Multiple water body segments in the Lake Pepin watershed are included in Minnesota's current 303(d) list of impaired waters, and Total Maximum Daily Loads (TMDLs) are being developed for

these impaired waters including Lake Pepin. LimnoTech has been contracted to develop a modeling tool to support a combined TMDL study for turbidity and nutrient enrichment. LimnoTech is performing this project through the following steps: 1) problem specification; 2) model framework selection and formulation; 3) model development; 4) model evaluation; and 5) model application. LimnoTech evaluated the existing models, and as necessary is enhancing and recalibrating them to available data.

Savannah Harbor Dissolved Oxygen TMDL Review. EPA Region 4 completed a draft dissolved oxygen TMDL for Savannah Harbor to satisfy a consent decree obligation established in *Sierra Club vs. EPA*. To meet the consent decree schedule, a draft TMDL was issued to attain the current, applicable site-specific dissolved oxygen criteria for

Savannah Harbor. It was felt that a waste load allocation of zero was unrealistic and unattainable, and that the TMDL should not be finalized until a revised criterion was developed for the harbor and the modeling was finalized. LimnoTech was contracted by the Central Savannah River Area TMDL coalition to review and provide comments on the TMDL. LimnoTech will complete this work through data compilation and evaluation; model calibration

review; model application review; and review of the appropriateness of alternative standards development.

Model for PCB Total Maximum Daily Load (TMDL) in the Potomac River Estuary. The Potomac River Estuary was listed as impaired under Section 303(d) of the Clean Water Act by levels of polychlorinated biphenyls (PCBs). The impaired region includes the tidal freshwater portions of the Anacostia and Potomac Rivers, and extends 110 miles downstream to the mouth of the Potomac at Chesapeake Bay. A court order required the development of total maximum daily loads (TMDLs) by the District of Columbia (DC), and the States of Maryland and Virginia, and approval by the U.S. Environmental Protection Agency no later than September 2007. LimnoTech conducted data assessments, reviewed monitoring plans, and developed and calibrated a PCB water quality model. The conceptual approach involved an integrated modeling framework that included hydrodynamics, sorbent dynamics, and PCB transport and fate. LimnoTech used the calibrated model to conduct PCB load reduction scenarios to determine the external PCB loads that could enter the system and still meet the applicable TMDL targets.