



### Total Maximum Daily Load

#### What Is The TMDL Process?

The Total Maximum Daily Load (TMDL) process provides a flexible assessment and planning framework for identifying load reductions or other actions needed to attain water quality standards (i.e. water quality goals to protect aquatic life, drinking water, and other water uses). Clean Water Act §303(d) established the TMDL process to guide application of state standards to individual waterbodies/watersheds. The process has three steps:

1. *Identify Quality Limited Waters*- States must identify and prepare a list [§303(d) list] of waters that do not or are not expected to meet water quality standards after applying existing required controls (e.g. minimum sewage treatment technology).
2. *Establish Priority Waters/Watersheds*- States must prioritize waters/watersheds and target high priority waters/watersheds for TMDL development.
3. *Develop TMDLs*- For listed waters, States must develop TMDLs that will achieve water quality standards, allowing for seasonal variations and an appropriate margin of safety. A TMDL is a quantitative assessment of water quality problems, contributing sources, and load reductions or control actions needed to restore and protect individual waterbodies.

State and territorial water quality agencies are usually responsible for implementing the TMDL process. EPA reviews and approves lists of quality-

limited waters requiring TMDLs and specific TMDLs. If EPA disapproves lists or TMDLs, EPA is required to establish the lists and/or TMDLs. EPA and tribal governments are currently clarifying how TMDL process requirements will be addressed in Indian country. Landowners, other agencies, and other stakeholders can often assist States or EPA in developing TMDLs for specific watersheds.

#### What Do TMDLs Address?

TMDLs should address all significant stressors which cause or threaten to cause waterbody use impairment, including:

- C *point sources* (e.g., sewage treatment plant discharges),
- C *nonpoint sources* (e.g., runoff from fields, streets, range, or forest land), and
- C *naturally occurring sources* (e.g., runoff from undisturbed lands).

A TMDL is the sum of the individual wasteload allocations for point sources, load allocations for nonpoint sources and natural background pollutants, and an appropriate margin of safety. TMDL Plans may address individual pollutants or groups of pollutants, as long as they clearly identify the links between:

- C *the waterbody use impairment or threat of concern,*
- C *the causes of the impairment or threat, and*
- C *the load reductions or actions needed to remedy or prevent the impairment.*

## What Are TMDLs Based On?

TMDLs are usually based on readily available information and studies. In some cases, complex studies or models are needed to understand how stressors are causing waterbody impairment. In many cases, simple analytical efforts provide an adequate basis for stressor assessment and implementation planning.

Where inadequate information is available to draw precise links between these factors, TMDLs may be developed through a *phased approach*. The phased approach enables states to use available information to establish interim targets, begin to implement needed controls and restoration actions, monitor waterbody response to these actions, and plan for TMDL review and revision in the future. Phased approach TMDLs are particularly appropriate to address nonpoint source issues.

TMDLs are developed to provide an analytical basis for planning and implementing pollution controls, land management practices, and restoration projects needed to protect water quality. States are required to include approved TMDLs and associated implementation measures in State water quality management plans or basin plans.

### TMDL Components

**Problem Statement:** A description of the waterbody/watershed setting, beneficial use impairments of concern, and pollutants or stressors causing the impairment.

**Numeric Target(s):** For each stressor addressed in the TMDL, appropriate measurable indicators and associated numeric target(s) based on numeric or narrative water quality standards which express the target or desired condition for designated beneficial uses of water.

**Source Analysis:** An assessment of relative contributions of pollutant or stressor sources or causes to the use impairment and extent of needed discharge reductions/controls.

**Loading Capacity Estimate:** An estimate of the assimilative capacity of the waterbody for the pollutant(s) of concern.

**Allocations:** Allocation of allowable loads or load reductions among different sources of concern, providing an adequate margin of safety. These allocations are usually expressed as wasteload allocations to point sources and load allocations to nonpoint sources. Allocations can be expressed in terms of mass loads or other appropriate measures. *The TMDL equals the sum of allocations and cannot exceed the loading capacity.*

**Monitoring Plan (for Phased Approach):** Plan to monitor effectiveness of TMDL and schedule for reviewing and (if necessary) revising TMDL and associated implementation elements.

### Implementation Measures

**Implementation Elements:** Description of best management practices, point source controls or other actions necessary to implement TMDL. Usually a plan is developed describing how and when necessary controls/restoration actions will be accomplished, and who is responsible for implementation. More information on TMDLs is available from U.S. EPA, California's State Water Resource Control Board and the Regional Water Quality Control Boards.

### References

U.S. EPA. 1991. Guidance for Water Quality-based Decisions: The TMDL Process. U.S. Environmental Protection Agency Pub. No. EPA 440/4-91-001.

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This fact sheet was adapted from information obtained from U.S. EPA Region 9 Webpage: <http://www.epa.gov/region09/water/tmdl/fact.html> by Mel George.

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