



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
WASHINGTON, D.C. 20460

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OFFICE OF  
WATER

**MEMORANDUM**

**SUBJECT:** Clarification Regarding "Phased" Total Maximum Daily Loads

**FROM:** Benita Best-Wong, Director *Benita Best Wong*  
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**TO:** Water Division Directors  
Regions I - X

This memorandum clarifies the *Guidance for Water Quality-Based Decisions: The TMDL Process*, issued in 1991, by explaining EPA's interpretation of the term "phased TMDL" as used in EPA guidance, and explaining the distinction between "phased TMDLs," "staged implementation," and "adaptive implementation." Phased TMDLs are a matter of TMDL development while staged implementation and adaptive implementation are post-development implementation concepts. Greater attention to these distinctions has emerged since EPA issued the 1991 Guidance and promulgated the Water Quality Guidance for the Great Lakes system in 1995, thus warranting today's additional clarification.

Current EPA guidance for developing TMDLs speaks of a "phased approach to developing TMDLs," frequently referred to as "phased TMDLs."<sup>i</sup> This concept has sometimes been misinterpreted and resulted in TMDLs that are not calculated to meet applicable water quality standards. This misinterpretation is not consistent with EPA's interpretation of 40 CFR Part 130.7. The regulations require all TMDLs to be calculated to achieve applicable water quality standards.<sup>ii</sup> EPA's interpretation was affirmed by a recent court decision.<sup>iii</sup>

**BACKGROUND**

**The 1991 Guidance**

The 1991 Guidance discusses the use of "phased TMDLs" in two situations.

In the first situation, the Guidance addresses waters impaired by both point and nonpoint sources where the wasteload allocation to point sources is predicated on nonpoint source loading reductions, i.e., where point sources receive a higher wasteload allocation because the TMDL assumes that reduced loads will come from nonpoint

sources. In such cases, the Guidance recommends that some additional provision in the TMDL, such as a schedule and description of the implementation mechanisms for nonpoint source control measures, be included to provide reasonable assurance that the nonpoint source measures will achieve the expected load reductions. Such additional provisions also assure compliance with the federal regulations at 40 CFR 130.2(i), which provide that in order for wasteload allocations to be made less stringent, more stringent load allocations must be "practicable."

In the second situation, the Guidance recommends the phased approach for situations where available data only allow for "estimates" of necessary load reductions or for "non-traditional problems" where predictive tools may not be adequate to characterize the problem with a sufficient level of certainty.<sup>iv</sup>

In both of these situations, the phased approach has sometimes been misinterpreted to mean that a phased TMDL may be calculated to improve water quality, but not to meet water quality standards. However, the Guidance clearly indicates that all TMDLs must be set at levels that meet water quality standards:

"Under the phased approach the TMDL has LAs (load allocations) and WLAs (wasteload allocations) calculated with margins of safety to meet water quality standards (emphasis added)."<sup>v</sup>

Additional text in the 1991 Guidance recommends that TMDLs established under the phased approach include a schedule for installation and evaluation of nonpoint source control measures, data collection, and assessment of water quality standards attainment. The Guidance also recommends that the schedule include a time frame within which water quality standards are expected to be met and within which controls will be re-evaluated if water quality standards have not been attained. The information would be used to determine whether the TMDL needs to be revised.

### The Water Quality Guidance for the Great Lakes

In addition to the two scenarios described in the 1991 Guidance, there is a third scenario described in the Great Lakes Water Quality Guidance which has also sometimes been referred to as a phased TMDL:

"Some TMDLs may be based on attaining water quality standards over a period of time, with specific controls on individual sources being implemented in stages (emphasis added). Determining this reasonable period of time in which water quality standards will be met is a case-specific determination..."<sup>vi</sup>

As with all TMDLs, these TMDLs must be established at a level necessary to meet water quality standards. However, in this situation, the time frame in which water quality standards will be achieved is based on a planned staged implementation of controls and a determination of the appropriateness of this timeframe is made on a case specific basis. Additionally, the types of additional measures that are recommended for inclusion in phased TMDLs as envisioned in the 1991 Guidance, such as monitoring to verify load reductions, evaluation of effectiveness of controls, and revision of load and wasteload allocations as necessary, are required by the Great Lakes regulations.

## CLARIFICATION

Based on program experience since 1991, it is apparent that many TMDLs may be established based on data that could subsequently be improved and that may involve a certain degree of uncertainty. Additionally, most TMDLs include both point and nonpoint sources. Therefore, most TMDLs could fit the conditions of the first scenario described in the 1991 Guidance and a meaningful distinction between a phased TMDL, as described in that scenario, and a regular TMDL does not exist. Moreover, the concept of adaptive implementation has come to the fore since the 1991 Guidance was issued. In its 2001 report, *Assessing the TMDL Approach to Water Quality Management*<sup>vii</sup> the National Research Council highlighted the need for EPA to encourage adaptive implementation of TMDLs. Therefore we are proposing the following clarification of the terms "phased TMDLs," "adaptive implementation," and "staged implementation."

### Phased TMDLs

We recommend the use of the term "phased TMDLs" be limited to TMDLs that for scheduling reasons need to be established despite significant data uncertainty and where the State expects that the loading capacity and allocation scheme will be revised in the near future as additional information is collected. In other words, phased TMDLs would be reserved for the second scenario described in the 1991 Guidance.

The phased TMDL approach would be used in situations where limited existing data are used to develop a TMDL and the State believes that the use of additional data or data based on better analytical techniques would likely increase the accuracy of the TMDL load calculation and merit development of a second phase TMDL. Such significant uncertainty may arise, for example, because the State is using a surrogate to interpret a narrative standard, or because there is little information regarding the loading capacity of a complex system such as an estuary and it is difficult to predict how the a water body will react to the planned load reductions. An example of a phased TMDL could be a TMDL for phosphorus in a lake watershed where there are uncertain loadings from the major land uses and/or limited knowledge of in-lake processes. In such a case, the loading capacity of the water body may be difficult to establish and the State may decide to include a schedule for establishing a revised TMDL based on follow-up monitoring. Phased TMDLs may also occur when a revision of the applicable standard is underway and will necessitate development of a second phase, revised TMDL to comply with the new standard.

All phased TMDLs must include all elements of a regular TMDL, including load allocations, wasteload allocations and a margin of safety. As with any TMDL, each phase must be established to attain and maintain the applicable water quality standard.<sup>viii</sup> In addition, EPA recommends that a phased TMDL document or its implementation plan include a monitoring plan and a scheduled timeframe for revision of the TMDL. (These elements would not be an intrinsic part of the TMDL and would not be approved by EPA, but may support a rationale for approving the TMDL. See also "Nonpoint Source Program and Grants Guidelines for states and Territories, Federal Register Vol. 68, pp 60653-74.)

Since phased TMDLs will in all likelihood need to be revised and therefore require more overall effort, States should carefully consider the necessity of such TMDLs, for example to meet consent decree deadlines or other mandatory schedules. Upon revision of the

loading capacity, wasteload, or load allocations, the TMDL would require re-approval by EPA.

### **TMDLs with Adaptive Implementation and Trading Provisions**

Adaptive implementation is an iterative implementation process that makes progress toward achieving water quality goals while using any new data and information to reduce uncertainty and adjust implementation activities. The National Research Council report suggests that adaptive implementation include "immediate actions, an array of possible long-term actions, success monitoring, and experimentation for model refinement."<sup>ix</sup> By using the adaptive implementation approach, one can utilize the new information available from monitoring following initial TMDL implementation efforts to appropriately target the next suite of implementation activities.

Phased TMDLs are an example of the adaptive implementation approach because each new phase utilizes new information to reevaluate the original TMDL. However, even for TMDLs where there is little uncertainty regarding the loading capacity of the water body and the necessary load reductions, an adaptive implementation approach can be a useful tool. Implementation of TMDLs can take many years and when uncertainty about the effectiveness of implementation activities exists, TMDLs would benefit from containing elements that would facilitate adaptive implementation such as, for example, provisions for a flexible load allocation/waste load allocation scheme. EPA is currently working to clarify how TMDLs can be written to provide for adjustments in the load and wasteload allocations in approved TMDLs.

EPA understands that not all TMDLs can be implemented using adaptive implementation methods due to the more intensive monitoring and added administrative steps associated with this iterative approach. Nonetheless, EPA believes that in appropriate cases it should be feasible for States to develop TMDLs that facilitate implementation of practicable controls while additional data collection and analysis are conducted to guide implementation actions. Follow-up monitoring is integral to the adaptive implementation approach. Monitoring addresses uncertainty in the efficacy of implementation actions and can provide assurance that implementation measures are succeeding in attaining water quality standards, as well as inform the ongoing TMDL implementation strategy. If adaptive implementation activities reveal that a TMDL loading capacity needs to be changed, the revision would require EPA approval. In most cases adaptive implementation is not anticipated to lead to the re-opening of a TMDL. Instead, it is a tool used to improve implementation strategies.

Another adaptive implementation tool to consider is water quality trading. Water quality trading can involve one or more TMDLs in a watershed context and include both point and nonpoint sources. Water quality trading is an effective TMDL implementation tool. More information about the feasibility of trading can be found in the Water Quality Trading Assessment Handbook.<sup>x</sup> One successful trading example is the Long Island Sound TMDL for nitrogen where municipal dischargers participate in a nitrogen reduction credit exchange program.

## **TMDLs with Staged Implementation**

The third type of TMDL, described in the Great Lakes Initiative, is different from the two preceding types. While not a "phased TMDL," it is a TMDL that anticipates implementation in several distinct stages. It is also different from the adaptive implementation scenario because it is anticipated that the load and wasteload allocations will not require any significant adjustments. Instead, implementation actions will be staged over a period of time. For example, EPA has approved mercury TMDLs where the wasteload allocation to point sources (which would be implemented within five years through the NPDES process) was predicated on long-term reductions in atmospheric mercury deposition. We believe that the appropriate terminology for such a TMDL, if a label needs to be applied, would be "staged implementation."

## **SUMMARY**

EPA is providing this clarification to ensure that there is a common understanding of the concepts discussed above and that the term "phased TMDL" is not used interchangeably to describe all three scenarios. This clarification does not imply that all TMDLs must fit neatly within one of these models. We recognize that some TMDLs will require "staged implementation" to a degree, particularly if they include nonpoint sources, and that in many of these cases the staging will be significant. This staging could also go hand-in-hand with adaptive management, such that some clearly needed control measures are implemented, while others are staged until additional information is collected.

If you have any questions please contact me or have your staff contact Valentina Cabrera-Stagno in the Watershed Branch at (202) 566-2022.

cc:

Water Quality Branch Chiefs, Regions I-X  
Permit Branch Chiefs, Regions I-X  
Regional TMDL Coordinators, Regions I-X

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<sup>i</sup> US EPA 1991. Guidance for Water-Quality-based Decisions: The TMDL Process, EPA440-4-91-001

<http://www.epa.gov/OWOW/tmdl/decisions/>

<sup>ii</sup> Part 130 of Title 40 of the Code of Federal Regulations, section 130.7, contains the regulations currently governing the Total Maximum Daily Load program, which were issued in 1985 and 1992

<sup>iii</sup> Minnesota Center for Environmental Advocacy v. EPA, No. 03-5450 (D. Minn. June 23, 2005)

<sup>iv</sup> US EPA, 1991 (page 22).

<sup>v</sup> US EPA, 1991 (page 22).

<sup>vi</sup> Part 132, Appendix F of Title 40 of the Code for Federal Regulations, Chapter I, contains the regulations governing the Total Maximum Daily Load program in the Great Lakes, which were issued in 1995.

<sup>vii</sup> National Research Council, 2001. Assessing the TMDL Approach to Water Quality Management. National Academy Press. Washington, DC.

<sup>viii</sup> Part 130 of Title 40 of the Code of Federal Regulations, section 130.7

<sup>ix</sup> National Research Council, 2001 (page 94).

<sup>x</sup> US EPA 2004. Water Quality Trading Assessment Handbook, EPA841-B-04-001