MCWRS Massachusetts Coalition for Water Resources Stewardship

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February 18, 2009

Mr. Michael Haire
Office of Water, Watershed Branch
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, N.W. (4503T)
Washington, D.C. 20460

Transmitted via Electronic Mail to haire.michael@epa.gov

Dear Mr. Haire:

We are pleased to have the opportunity to submit the following comments of the Massachusetts Coalition for Water Resources Stewardship (the Coalition) on the *Draft Handbook for Developing Watershed Total Maximum Daily Loads*. The email request for comments we received indicated comments should be directed to your attention via electronic mail.

The Coalition is an organization of municipalities; public agencies that transport and treat drinking water, wastewater and stormwater; quasi-government agencies and private and nonprofit organizations that are interested or involved in water resources stewardship. The Coalition is comprised of professionals who are committed to the principles of stewardship and sustainability and whose responsibilities include protecting the environment and public health using scientifically based, fiscally responsible approaches to realize environmental and community goals.

Please feel free to contact me if you have any questions.

Best regards,

Kate Barrett
Executive Secretary

Attachment

Cc: Jane Madden, CDM/Coalition Member
Phil Guerin, City of Worcester/Coalition Member
Stephen Perkins, USEPA
Glenn Haas, MassDEP

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US EPA
Handbook For Developing Watershed TMDLs (Draft December 15, 2008)
MA Coalition for Water Resources Stewardship Comments
February 18, 2009

General Comments:

(1) The concept of watershed-based TMDLs is generally supported and consistent with the Coalition's desire to see holistic, watershed-based NPDES permitting that addresses the most cost effective solutions.

(2) With the significant burden of producing TMDLs that is placed on states (as described in the document), it would seem there should be a stronger focus on prioritizing those waters that need TMDLs. Perhaps the document needs to put greater emphasis on setting priorities as that does not appear to be happening in Massachusetts. Too many of the TMDLs done in Massachusetts, especially in the central part of the state, are for ponds that have very limited value as recreational or fisheries resources. Scarce financial resources should be directed toward TMDL development of high value waters such as those associated with drinking water sources, those supporting heavy recreational use and those with unique or high quality ecological value. Instead, resources are directed toward small ponds that few know about or have access to.

(3) The handbook attempts to describe the economic and technical benefits to applying a watershed TMDL approach; however, some of the technical arguments require further clarification or discussion. The overall advantage of the watershed approach is that it allows for the selection of the potentially most successful scientifically-based allocations/reductions, which may vary from one subwatershed to another, to eliminate water quality impairments in the watershed. Single segment TMDLs may not accomplish this, depending on the impairment. The handbook discusses the "top-down" TMDL implementation approach (resolve upstream impairments first, then address downstream impairments); however, discussion of a possible "feedback loop" should also be provided (downstream impairment may need even greater percent load reduction than upstream impairment).

(4) Figure 3-1 in Section 3 (Identifying Candidates for Watershed TMDL Development) is confusing and perhaps is trying to describe two separate tasks in the TMDL development process (setting criteria for identifying good watershed TMDL candidates, and subdividing a

watershed into specific subwatersheds for analysis). Additional clarification, explanation or revision of this figure would be helpful.

(5) In Section 4 (Developing Watershed TMDLs) the Watershed Management Model (WMM), mass-balance analyses, and similar methods are classified as "non-modeling", though these methods are classified as models in EPA's Compendium of Tools for Watershed Assessment and TMDL Development. These analytical evaluations, when applied appropriately, are suitable tools for TMDL development and implementation. Specifically WMM has been applied in parallel with more complex continuous simulation tools (Wagner and Schmidt, 2001) such as HSPF and SWMM, and it has been shown to yield the same management plan recommendations. The value of a tool like WMM is the ability to cost-effectively screen a number of management plan combinations (with stakeholders) to demonstrate the relative magnitudes of the water quality impairments versus different sources and BMPs to mitigate the sources.

(6) In Section 4.1 (Stakeholder and Public Involvement), it should be specifically noted that **all municipalities** in the watershed should also be involved in the process by agencies. TMDL pollutant reduction requirements applied through permits to municipal stormwater managers, wastewater dischargers, industrial dischargers and private property owners all have impacts on municipalities whether through direct costs or indirect costs (loss of tax base as industrial/commercial properties relocate to regions that are more reasonable).

(7) In Section 5 (Supporting Implementation of Watershed TMDLs), more detail and explanation is needed in the section on watershed-based permitting. There is also a brief section on water quality trading. The handbook assumes that wastewater point sources will be the party buying the treatment credits; however, many nonpoint source reductions will involve retrofits in urbanized areas that can be very expensive. In some cases, the wastewater discharge reduction may be less expensive to implement in terms of $/Lb of pollutant removed in terms of project capital and life cycle costs. The rate of implementation should also be considered (with permit implementation schedule), and regional upgrade(s) with reuse could be implemented more quickly than many stormwater treatment systems (in some municipalities hundreds). Therefore, it may be more cost-effective in some cases for the nonpoint sources to buy credits from wastewater discharges. Other considerations for this would include whether other benefits are necessary or desired (e.g., flood and /or erosion control, aquifer recharge, wetlands and stream restoration, parks), and if specific tributary impairments require local scale implementation to meet water quality in these tributaries not affected by a wastewater treatment plant reduction.

Specific Comments:

(1) Page 12, Section 2.1Environmental Benefits - Includes Broader Source Assessment
"By focusing only on single-segment TMDLs, a practitioner might miss a source that is outside the immediate drainage area but contributes a significant pollutant load that influences the segment's water quality."

Comment: Technically this should never happen, since a single segment TMDL study would consider all pollutants sources from the segment's tributary area.

(2) Page 13, Section 2.1Environmental Benefits - Captures the Interaction Between Upstream and Downstream Sources and Impacts.
"Considering the cumulative impact of all sources allows TMDL practitioners to optimize and maximize source reductions in the allocation process."
Comment: The document needs to define what "optimize" and/or "maximize" source reductions means, because these terms are found, seemingly interchangeably, throughout the document. Is maximizing load reduction identifying the most cost effective means of reducing loads?

(3) Page 21, Section 2.3 Implementation Benefits - Facilitates Use of Innovative Implementation Options.
"Water quality trading programs allow for those point sources with higher pollutant control costs to achieve their WLA in a more cost effective manner by paying another pollutant source, whose control costs are lower, to make pollutant reductions needed to meet the WLA or the new water quality-based effluent limitation (WQBEL) that is derived from the WLA."

Comment: In several sections of the report, trading seems predicated on the assumption that it is traditional point source dischargers (i.e., wastewater treatment facilities) that will be looking "purchase" load reduction credits. If a TMDL includes substantial reduction requirement for nonpoint source loads in highly urbanized areas, it may be the nonpoint source (e.g., stormwater) load reduction that is more expensive in terms of $/Lb and overall cost. This is the case in the Lower St. Johns River (FL) TMDL.

(4) Page 24, Figure 3-1.

Comment: This figure is not entirely consistent with the text. It appears that the criteria described in Figure 3-1 would be applied in order (1,2,3) to identify the most desirable candidates for watershed TMDL development. This is further enforced by the graphics, which show three figures connected with arrows. However, text on the next page states that the steps shown are not dependent on one another, and may not even be relevant in some cases. The title of the figure suggests that it is demonstrating the process for identifying the scope of a watershed TMDL, not the process of identifying good watershed TMDL candidates. Maybe these two issues (criteria and scope) need two separate figures or maybe the criteria should just be removed from this figure. (Note: the name of the chapter is "Identifying Candidates" not "Identifying Scope of a Watershed TMDL).

(5) Page 26, 3.1.1. Impairment and Source Type
"In addition, sediment and nutrients are often associated with shared sources because nutrients can be sorbed to sediments and delivered to receiving waters through erosion and runoff processes."

Comment: Sources may be high in sediment (TSS) and nutrients, but that does not mean that it is because the nutrients are sorbed to the sediment. This may be more likely in agricultural areas, than in urban areas.

(6) Page 33. Example Analysis to Identify Groupings for Watershed TMDL Development
"The reservoir can serve as an upstream boundary for the watershed of the Oak River grouping and allow for the upstream segments to be analyzed separately from downstream segments."

Comment: It should be also stated that using the lake as a boundary presumes that there are statistically and scientifically valid stage-flow and water quality measurements available for this location. If the land uses and sources vary over the monitoring time period, this should also be accounted for in the TMDL and allocations.

(7) Page 42, 4.2.1. Data Analysis for Problem Identification
"With the larger area, there is more potential for variations in the amount, type, and quality of data throughout the watershed. Incomparable data can create difficulties in conducting meaningful statistical or modeling analyses."

Comment: Consider combining two sentences to say "With the larger area, there is more potential for variations in the amount, type and quality of data throughout the watershed, which can create difficulties in conducting meaningful statistical comparisons or modeling analyses."

(8) Page 42, 4.2.1. Data Analysis for Problem Identification
"TMDLs are sometimes developed with less than desirable amount, period and spatial distribution of data. Existing TMDL program guidance (USEPA 1991) suggests that having limited data is not a sufficient reason for *not* developing a TMDL and recommends that TMDLs be developed with the best available data." The section further suggests that those TMDLs that are built with insufficient data can be revised at some future time when data is available.

Comment: We strongly disagree with this approach. TMDLs should not be developed where data is lacking, suspect or otherwise insufficient. TMDL implementation requires expenditures by someone, usually the municipal stormwater program, dischargers, or property owners. In instances where the TMDL pollutant reductions are tied into a NPDES permit, these implementation costs can be quite significant. If some public or private entity will be burdened with TMDL implementation costs there is no question that the TMDL must first be based on valid data. To suggest that a baseless TMDL is acceptable as it can be modified in the future is unrealistic when one considers the burden already placed on the states to roll out new TMDLs is overwhelming. There is slim chance that any state will be modifying an existing, faulty TMDL when it has thousands of new TMDLs to produce. Throughout the document it is noted that TMDLs must be "scientifically defensible." Suggesting that TMDLs developed with insufficient data are acceptable flies in the face of "scientifically defensible." Valid, defensible science can only be achieved through collection of sound data. We recommended that the document establish minimum requirements for data that are necessary to produce valid TMDLs. For example, a minimum of 12 months of water quality data on a pollutant of concern entering or present in an impaired water should be collected before a TMDL for that water and that pollutant is developed. Too many TMDLs are based on assumptions and conjecture and lack substantive data to support loading reduction requirements or to confirm that an impairment even exists. Many ponds in central Massachusetts are listed as impaired and have TMDLs for phosphorous based on visual observation of aquatic weed growth and the assumption that excessive phosphorous inputs are the cause. Perhaps a slightly more detailed analysis would reveal that aquatic growth is not a function of nutrient loads but of water depth and bottom substrate.

(9) Page 43, 4.2.1. Data Analysis for Problem Identification - Spatial Analysis
"When completing a watershed TMDL, spatial analyses can be used to look at trends throughout the entire watershed or more specifically evaluate data bracketing areas of concern or of expected source activity."

Comment: The term "trends" suggests changes over time; perhaps "variations" should replace the "trends". Also, perhaps this section should include some discussion of statistical analysis (e.g., parametric and non-parametric tests for comparisons of means and distributions between watershed locations) as well as the graphical methods presented.

(10) Page 46, 4.2.1. Data Analysis for Problem Identification - Temporal Analysis
"A temporal analysis of water quality data can help to identify seasonal sources and associated loads (e.g., grazing, seasonal residents, and recreational uses), identify new sources, and compare pre- and post-source water quality data."

Comment: It is not clear how temporal analysis could identify new sources. Additionally, clarification is needed how the analysis could be used to "compare pre- and post-source water quality data". This presumes that data for a sufficient period are available to draw conclusions and sufficient information on the load sources and their contributions over time (e.g., changes in wastewater discharges, urban or agricultural land use changes).

(11) Page 48, 4.2.1. Data Analysis for Problem Identification - Evaluation of Multiple Parameters
"Similarly, some waterbodies experienced historical accumulation of pollutants, such as metals or pesticides that adsorb to sediments but do not die-off."

Comment: Suggest replacing "die-off" with "degrade" or "transform". The term die-off should also be re-considered if used for bacteriological references since, as an example, there can be a significant portion of the fecal coliform population that can transform to atypical coliform bacteria outside the body (they do not actually die, they do not show up in the standard gram stain procedure).

(12) Page 52, Figure 4-7 and Table 4-1

Comment: Replace "TMDL" with "Watershed TMDL".

(13) Page 54, 4.3.1. Factors Affecting Selection of Technical Approach for Watershed TMDL Development - What Are the Sources?
"The most basic distinction in sources and how they affect selection of a TMDL technical approach is whether they are delivered through surface runoff (e.g., precipitation-driven) or discharged directly to the waterbody at a discrete location."

Comment: This may not be an "either-or" case: CSOs are precipitation-driven and discharge directly at a discrete location.

(14) Page 57, 4.3.2. Practical Applications of Various Approaches for Watershed TMDL Development - Modeling Approaches
"With dynamic models, practitioners can track the fate of pollutant loads transported downstream from subwatershed to subwatershed."

Comment: A dynamic model is helpful, but not necessary, for evaluating the transport of loads from upstream to downstream; for instance, see the example on page 67. Dynamic models allow the user to account for daily or sub-daily variability in flows/concentration/loads. The choice of a dynamic model is more a function of the duration/frequency of impairment than the need to represent upstream to downstream transport of loads.

(15) Page 57, 4.3.2. Practical Applications of Various Approaches for Watershed TMDL Development - Watershed Models
"A primary advantage of developing a watershed TMDL using a watershed model is the ability to consider the entire watershed and use a "top-down" method of assessing loading and determining allocations. This maximizes the allocations and fully considers the relative impact of the various sources."

Comment: It is not clear by what is meant by "maximizing the allocations" (e.g., maximize the benefit of the allocations versus the costs to meet the TMDL?).

(16) Page 57, 4.3.2. Practical Applications of Various Approaches for Watershed TMDL Development - Watershed Models
"Watershed models emphasize description of watershed hydrology and water quality, including runoff, erosion, and washoff of sediment and pollutants."

Comment: These models also include representation of surface runoff, erosion of sediment and sediment-associated pollutants from pervious land areas, and buildup and wash-off of pollutants for impervious land areas.

(17) Page 57, 4.3.2. Practical Applications of Various Approaches for Watershed TMDL Development - Watershed Models
"Watershed models vary in the level of detail, including what processes they simulate and the simulation timestep (e.g., daily vs. monthly)."

Comment: Replace "daily vs. monthly" with "sub-daily, daily, or monthly".

(18) Page 60, Second to last sentence.
"Alternatively, detailed models such as HSPF and LSPC not only include instream routing but also include a full water quality component that can simulate chemical and biological processes within receiving water segments and simulate the fate and transport of flow and loads from one segment to the next."

Comment: These models simulate physical scour and settling processes as well, although like most models, cross-sections are not adjusted for scour or deposition.

(19) Page 63, 4.3.2. Practical Applications of Various Approaches for Watershed TMDL Development - Receiving Water Models
"Steady-state models operate under a single nonvariable flow condition with constant inputs, typically used to evaluate conditions for a design or critical flow."

Comment: Steady state models operate under a single nonvariable flow and load condition. Different combinations of constant flow and loads can be used to evaluate different conditions if necessary.

(20) Page 63, 4.3.2. Practical Applications of Various Approaches for Watershed TMDL Development - Non-modeling Approaches

Comment: In general, some of the methods listed in this section (e.g., "Steady State or Mass Balance Analysis", "Simple Method", "Export Coefficients/Pollutant Budgets") still constitute "modeling" and are classified as models in EPA's "Compendium of Tools for Watershed Assessment and TMDL Development " (see General Comments above).

(21) Page 63, 4.3.2. Practical Applications of Various Approaches for Watershed TMDL Development - Non-modeling Approaches
"Nonmodeling approaches to TMDL development are typically based on statistical analysis of ambient data or on an empirical calculation representing land-based processes."

Comment: By this definition, HSPF is a "non-model" - the hydrology in HSPF (Stanford Watershed Model) is built on empirical equations (most models are).

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(22) Page 65, Practical Applications of Various Approaches for Watershed TMDL Development - Load Duration

"In this case, assumptions are usually made to extrapolate flow and/or water quality conditions from nearby segments to support TMDL calculation for the impaired segments. In addition, load duration curves for TMDL development are applicable only to non-tidal streams or rivers and might not be appropriate or would require combination with other approaches in watersheds with different types of impaired waterbodies (e.g., lakes and streams)."

Comment: Presumably sufficient water quality data are available to designate the segment as being impaired, and as such extrapolation of conditions would not be necessary. Also, load duration curves may not be appropriate when evaluating water quality constituents such as DO or algae, which are affected by other constituents (e.g., BOD, nutrients) and receiving water processes in the water column (e.g., algae and macrophyte respiration) and sediment (e.g., SOD and sediment diagenesis such as nutrient fluxes).

(23) Page 68, 4.3.2. Practical Applications of Various Approaches for Watershed TMDL Development - Export Coefficients/Pollutant Budgets

"Export coefficients can be obtained for literature values from regional or national studies (e.g., EPA's Nationwide Urban Runoff Program [NURP] study [USEPA 1983])."

Comment: It may also be appropriate to include more recent citations, such as the National Stormwater Quality Database (Pitt, 2004).

(24) Page 68, 4.3.2. Practical Applications of Various Approaches for Watershed TMDL Development - Export Coefficients/Pollutant Budgets

"For development of a watershed TMDL, this approach provides little utility in the evaluation of relative magnitude or impact of watershed sources, and the utility of any evaluation of waterbody response to individual or multiple sources would depend on what supplementary waterbody-based approach were used."

Comment: Models like WMM do a very good job of evaluating relative magnitudes from various sources.

(25) Page 68, 4.3.2. Practical Applications of Various Approaches for Watershed TMDL Development - Simple Method

"Because the method assumes all loading originates on impervious surfaces during storm events, it does not account for runoff from impervious areas or subsurface inputs and baseflow loading."

Comment: The method accounts only for surface runoff loading. The method does presume some runoff from pervious land. The phrase "does not account for runoff from impervious areas" should be deleted.

(26) Page 70, 4.4.1. Scale or Resolution of Source Allocations

"Upstream reductions can significantly decrease or even eliminate the need for reductions in the lower subwatersheds, thereby optimizing the necessary reductions and associated source controls."

Comment: In some cases, it is possible that the upstream reduction will have to be even greater to meet the downstream impairment.

(27) Page 82, 5.1.1. Watershed-based Permitting

"Implementation options available under an NPDES watershed framework can include a wide range of activities, such as:

- NPDES permit development and issuance on a watershed basis
- Wet-weather integration
- Indicator development for watershed-based stormwater management
- Monitoring consortium development
- Permit synchronization
- Statewide rotating basin planning approach (USEPA 2007a)"

Comment: These bullets should have some brief explanation (i.e., what does wet-weather integration entail? What is permit synchronization?)

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