September 22, 2004

Robert W. Golledge, Jr., Commissioner
Department of Environmental Protection
1 Winter Street
Boston, MA 02108

Re: Approval of Palmer River Bacteria TMDLs

Dear Commissioner Golledge:

Thank you for submitting the August 23, 2004, Palmer River Bacteria Total Maximum Daily Loads (TMDLs). The purpose of the TMDLs are to address bacterial impairments in the Palmer River.

The U.S. Environmental Protection Agency (EPA) has reviewed the document and it is my pleasure to approve the 13 TMDLs. EPA has determined, as set forth in the enclosed review document, that these TMDLs for the Palmer River meet the requirements of Section 303(d) of the Clean Water Act (CWA) and EPA's implementing regulations at 40 Code of Federal Regulations (CFR) part 130.
Please pass on to your staff in the Division of Watershed Management our congratulations for their excellent work in developing these TMDLs. In addition, we look forward to working cooperatively with MA DEP in exercising our shared responsibility of implementing the requirements under Section 303(d) of the CWA.

Sincerely,

Linda Murphy, Director
Office of Ecosystem Protection

cc: Cynthia Giles
Glenn Haas
Rick Dunn
Russ Isaac

EPA NEW ENGLAND'S TMDL REVIEW

DATE: September 16, 2004

TMDL: Palmer River TMDLs for Bacteria

STATUS: Final

IMPAIRMENT/POLLUTANT: 13 Bacterial TMDLs on 13 segments (MA53-03, MA53-04, MA53-05, Palmer River – West Branch, Rumney Marsh Brook, Bad Luck Brook, Clear Run Brook, Old Swamp Brook, Palmer River – East Branch, Beaver Dam Brook, Fullers Brook, Torrey Creek, and Rocky Run).

BACKGROUND: Final Palmer River TMDL for Bacteria, August 23, 2004

REVIEWER: Mike Hill, telephone number 617.918.1398, e-mail address: hill.michael@epa.gov

REVIEW ELEMENTS OF TMDLs

Section 303(d) of the Clean Water Act (CWA) and EPA's implementing regulations at 40 C.F.R. § 130 describe the statutory and regulatory requirements for approvable TMDLs. The following information is generally necessary for EPA to determine if a submitted TMDL fulfills the legal requirements for approval under Section 303(d) and EPA regulations, and should be included in the submittal package. Use of the verb "must" below denotes information that is required to be submitted because it relates to elements of the TMDL required by the CWA and by regulation.

1. Description of Waterbody, Pollutant of Concern, Pollutant Sources and Priority Ranking

The TMDL analytical document must identify the waterbody as it appears on the State/Tribe's 303(d) list, the pollutant of concern and the priority ranking of the waterbody. The TMDL submittal must include a description of the point and nonpoint sources of the pollutant of concern, including the magnitude and location of the sources. Where it is possible to separate natural background from nonpoint sources, a description of the natural background must be provided, including the magnitude and location of the source(s). Such information is necessary for EPA's review of the load and wasteload allocations which are required by regulation. The TMDL submittal should also contain a description of any important assumptions made in developing the TMDL, such as: (1) the assumed distribution of land use in the watershed; (2) population characteristics, wildlife resources, and other relevant information affecting the characterization of the pollutant of concern and its allocation to sources; (3) present and future growth trends, if taken into consideration in preparing the TMDL; and, (4) explanation and analytical basis for expressing the TMDL through surrogate measures, if applicable. Surrogate measures are parameters such as percent fines and turbidity for sediment impairments, or chlorophyl a and phosphorus loadings for excess algae.

Assessment:

The TMDL document describes the Palmer River Basin and identifies those segments that are not attaining the designated uses of Class B and Class SA waters due to exceeding Massachusetts' fecal coliform (indicator bacteria) criteria. The TMDL identifies a total of ten impaired segments, three of which are included on Massachusetts' 2002 Integrated 303(d) list

and an additional ten segments that are anticipated to be included on Massachusetts' 2006 303(d) list.

The TMDL document adequately describes the non-point and point sources of bacteria that are present within the Palmer River Basin and that contribute to exceedences of the Massachusetts' adopted fecal coliform criteria in the Palmer River and tributaries. Known and suspected sources for different river segments and tributary streams are discussed on pages 19-22. The TMDL provides a general description of bacteria contributions from bacteria source categories (e.g., storm water runoff, livestock, wildlife, pasture/crop land, septic systems, etc.). EPA concurs with MA DEP's approach for this TMDL because of the highly variable and site-specific nature of bacteria sources in watersheds like the Palmer River Basin which make it difficult to accurately estimate the magnitude of bacteria sources entering receiving waters. However, ambient data collected throughout the Palmer River Basin during both dry and wet weather conditions provide an insight into the overall magnitude of sources contributing to the Palmer River Basin.

EPA concludes that the TMDL document has adequately characterized the Palmer River Basin, the nature of the impairment and cause. MA DEP has relied on best available information including extensive ambient monitoring of the Palmer River Basin during both dry and wet weather conditions, source monitoring, and information from other studies and references to characterize the source categories. EPA believes that the approach used by MA DEP effectively documents the extent and magnitudes of the impairments due to bacteria contamination, as well as the types of sources that are likely to be present in the Palmer River watershed and that are in need of abatement.

2. Description of the Applicable Water Quality Standards and Numeric Water Quality Target

The TMDL submittal must include a description of the applicable State/Tribe water quality standard, including the designated use(s) of the waterbody, the applicable numeric or narrative water quality criterion, and the antidegradation policy. Such information is necessary for EPA's review of the load and wasteload allocations which are required by regulation. A numeric water quality target for the TMDL (a quantitative value used to measure whether or not the applicable water quality standard is attained) must be identified. If the TMDL is based on a target other than a numeric water quality criterion, then a numeric expression, usually site specific, must be developed from a narrative criterion and a description of the process used to derive the target must be included in the submittal.

Assessment:

The TMDL document presents the applicable Massachusetts Water Quality Standards on page 7. The fecal coliform criteria are used as the numeric water quality target for the TMDL. EPA concludes that MA DEP has properly presented the applicable Water Quality Standards.

3. Loading Capacity - Linking Water Quality and Pollutant Sources

As described in EPA guidance, a TMDL identifies the loading capacity of a waterbody for a particular pollutant. EPA regulations define loading capacity as the greatest amount of loading that a water can receive without violating water quality standards (40 C.F.R. § 130.2(f)). The loadings are required to be expressed as either mass-

per-time, toxicity or other appropriate measure (40 C.F.R. § 130.2(i)). The TMDL submittal must identify the waterbody's loading capacity for the applicable pollutant and describe the rationale for the method used to establish the cause-and-effect relationship between the numeric target and the identified pollutant sources. In most instances, this method will be a water quality model. Supporting documentation for the TMDL analysis must also be contained in the submittal, including the basis for assumptions, strengths and weaknesses in the analytical process, results from water quality modeling, etc. Such information is necessary for EPA's review of the load and wasteload allocations which are required by regulation.

In many circumstances, a critical condition must be described and related to physical conditions in the waterbody as part of the analysis of loading capacity (40 C.F.R. § 130.7(c)(1)). The critical condition can be thought of as the "worst case" scenario of environmental conditions in the waterbody in which the loading expressed in the TMDL for the pollutant of concern will continue to meet water quality standards. Critical conditions are the combination of environmental factors (e.g., flow, temperature, etc.) that results in attaining and maintaining the water quality criterion and has an acceptably low frequency of occurrence. Critical conditions are important because they describe the factors that combine to cause a violation of water quality standards and will help in identifying the actions that may have to be undertaken to meet water quality standards.

Assessment:

The TMDL document identifies the bacteria loading capacity for the Palmer River Basin on pages 23 and 24. MA DEP chose to express the loading capacities in terms of concentrations set equal to the criteria in Massachusetts' Water Quality Standards for several reasons. First, MA DEP believes that expressing a loading capacity for bacteria in terms of concentrations set equal to the Commonwealth adopted criteria provides a very clear and understandable expression of water quality goals to the public and to groups that conduct water quality monitoring in the Palmer River Basin. MA DEP believes that expressing the loading capacity for bacteria in terms of loadings (e.g., numbers of organisms per day) would be difficult for the public to interpret and understand because the "allowable" loading number would be very large (i.e. billions of organisms per day). Additionally, the number would vary according to flow rate since the loading capacity is dependent on stream flow rates which are constantly changing. Also, to ensure attainment with Water Quality Standards throughout the water body MA DEP believes the goals of the TMDL should be clear that bacteria sources should not exceed the criteria at the point of discharge. Loading numbers calculated on a daily basis would not ensure compliance with water quality standards throughout the day since it is conceivable that a large number of bacteria could be discharged during a brief period (e.g., few hours) resulting in temporary exceedences of the criteria, but meeting the daily load.

EPA concludes that loading capacities expressed in the TMDL document are set at levels that would result in attainment with water quality standards since they are set directly equal to the fecal coliform criteria in the water quality standards. EPA believes that the approach and rationale used by MA DEP to express the loading capacities as concentrations is reasonable and consistent with 40 C.F.R. 130.2(i) which allows for TMDLs to be expressed as either mass per time, toxicity, or other appropriate measure.

4. Load Allocations (LAs)

EPA regulations require that a TMDL include LAs, which identify the portion of the loading capacity allocated to existing and future nonpoint sources and to natural background (40 C.F.R. § 130.2(g)). Load allocations may range from reasonably accurate estimates to gross allotments (40 C.F.R. § 130.2(g)). Where it is possible to

separate natural background from nonpoint sources, load allocations should be described separately for background and for nonpoint sources.

If the TMDL concludes that there are no nonpoint sources and/or natural background, or the TMDL recommends a zero load allocation, the LA must be expressed as zero. If the TMDL recommends a zero LA after considering all pollutant sources, there must be a discussion of the reasoning behind this decision, since a zero LA implies an allocation only to point sources will result in attainment of the applicable water quality standard, and all nonpoint and background sources will be removed.

Assessment:

The TMDL sets load allocations for non-point sources (e.g. storm water runoff) equal to either the applicable fecal coliform criteria of the receiving water or to zero if the origin of the source is prohibited (e.g., failing septic systems.) EPA concludes that load allocations are adequately specified in the TMDL at levels necessary to attain and maintain water quality standards.

5. Wasteload Allocations (WLAs)

EPA regulations require that a TMDL include WLAs, which identify the portion of the loading capacity allocated to existing and future point sources (40 C.F.R. § 130.2(h)). If no point sources are present or if the TMDL recommends a zero WLA for point sources, the WLA must be expressed as zero. If the TMDL recommends a zero WLA after considering all pollutant sources, there must be a discussion of the reasoning behind this decision, since a zero WLA implies an allocation only to nonpoint sources and background will result in attainment of the applicable water quality standard, and all point sources will be removed.

In preparing the wasteload allocations, it is not necessary that each individual point source be assigned a portion of the allocation of pollutant loading capacity. When the source is a minor discharger of the pollutant of concern or if the source is contained within an aggregated general permit, an aggregated WLA can be assigned to the group of facilities. But it is necessary to allocate the loading capacity among individual point sources as necessary to meet the water quality standard.

The TMDL submittal should also discuss whether a point source is given a less stringent wasteload allocation based on an assumption that nonpoint source load reductions will occur. In such cases, the State/Tribe will need to demonstrate reasonable assurance that the nonpoint source reductions will occur within a reasonable time.

Assessment:

The TMDL sets wasteload allocations for point sources (e.g., discharges from storm water drainage systems) equal to either the applicable fecal coliform criteria of the receiving water or to zero if the origin of the source is prohibited (e.g., failing septic systems.) In the Palmer River Watershed, Rehoboth and Swansea, are subject to Phase II NPDES storm water permitting and therefore must be categorized in the WLA portion of the TMDL. In addition, States have discretion to include non-NPDES storm water discharges in the WLA portion and this TMDL may include some non-NPDES regulated storm water point sources in the WLA. EPA concludes that wasteload allocations are adequately specified in the TMDL at levels necessary to attain and maintain water quality standards.

6. Margin of Safety (MOS)

The statute and regulations require that a TMDL include a margin of safety to account for any lack of knowledge concerning the relationship between load and wasteload allocations and water quality (CWA § 303(d)(1)(C), 40

C.F.R. § 130.7(c)(1)). EPA guidance explains that the MOS may be implicit, i.e., incorporated into the TMDL through conservative assumptions in the analysis, or explicit, i.e., expressed in the TMDL as loadings set aside for the MOS. If the MOS is implicit, the conservative assumptions in the analysis that account for the MOS must be described. If the MOS is explicit, the loading set aside for the MOS must be identified.

Assessment:

This TMDL provides for a very conservative implicit MOS. Since the TMDL sets the loading capacity, load allocations, and wasteload allocation equal to either the applicable fecal coliform criteria of the receiving water or zero if the sources are prohibited, there is a high level of confidence that the TMDL is established at levels that are consistent with the water quality standards. The approach used by MA DEP assumes zero dilution and that no mixing will occur and does not account for in-stream processes such as bacteria die-off and settling which are known to reduce in-stream bacteria concentrations.

EPA concludes that the environmentally conservative approach used in developing this TMDL provides for an adequate implicit MOS.

7. Seasonal Variation

The statute and regulations require that a TMDL be established with consideration of seasonal variations. The method chosen for including seasonal variations in the TMDL must be described (CWA § 303(d)(1)(C), 40 C.F.R. § 130.7(c)(1)).

Assessment:

The TMDL document addresses seasonal variability on page 26. Since the LAs and WLAs apply throughout the year, independent of seasonal and climatic conditions, and are set equal to the applicable fecal coliform criteria or zero if the sources are prohibited, the TMDL ensures attainment of water quality standards for all seasonal conditions.

EPA concludes that the TMDL document has adequately addressed seasonal variability.

8. Monitoring Plan for TMDLs Developed Under the Phased Approach

EPA's 1991 document, Guidance for Water Quality-Based Decisions: The TMDL Process (EPA 440/4-91-001), recommends a monitoring plan when a TMDL is developed under the phased approach. The guidance recommends that a TMDL developed under the phased approach also should provide assurances that nonpoint source controls will achieve expected load reductions. The phased approach is appropriate when a TMDL involves both point and nonpoint sources and the point source is given a less stringent wasteload allocation based on an assumption that nonpoint source load reductions will occur. EPA's guidance provides that a TMDL developed under the phased approach should include a monitoring plan that describes the additional data to be collected to determine if the load reductions required by the TMDL lead to attainment of water quality standards.

Assessment:

The document describes post -TMDL monitoring activities, MA DEP's commitment for monitoring every five years and the requirements of Phase II general permits for storm water in the Rehoboth and Swansea communities. In addition, activities that are currently ongoing

and/or planned to ensure that the TMDL can be implemented include agricultural BMPs, septic tank controls, documentation of storm drain outfall locations, watershed resident education and additional monitoring (See pages 26 - 30).

EPA concludes that the monitoring and phased approach of achieving the TMDL is acceptable.

9. Implementation Plans

On August 8, 1997, Bob Perciasepe (EPA Assistant Administrator for the Office of Water) issued a memorandum, "New Policies for Establishing and Implementing Total Maximum Daily Loads (TMDLs)," that directs Regions to work in partnership with States/Tribes to achieve nonpoint source load allocations established for 303(d)-listed waters impaired solely or primarily by nonpoint sources. To this end, the memorandum asks that Regions assist States/Tribes in developing implementation plans that include reasonable assurances that the nonpoint source load allocations established in TMDLs for waters impaired solely or primarily by nonpoint sources will in fact be achieved. The memorandum also includes a discussion of renewed focus on the public participation process and recognition of other relevant watershed management processes used in the TMDL process. Although implementation plans are not approved by EPA, they help establish the basis for EPA's approval of TMDLs.

Assessment:

The implementation plan for Palmer River Basin bacterial TMDL is described on pages 26 - 30. The plan outlines implementation tasks and regulatory programs (Title 5 and Phase II Storm Water requirements) to address bacterial sources. In addition, the document identifies government agencies (e.g., Massachusetts Department of Agricultural Resources) and organizations like the Palmer River Watershed Alliance and Save the Bay to seek support for carrying out the recommendations set forth in the document.

EPA concludes that the approach taken by MA DEP is reasonable and will lead to water quality standards attainment.

10. Reasonable Assurances

EPA guidance calls for reasonable assurances when TMDLs are developed for waters impaired by both point and nonpoint sources. In a water impaired by both point and nonpoint sources, where a point source is given a less stringent wasteload allocation based on an assumption that nonpoint source load reductions will occur, reasonable assurance that the nonpoint source reductions will happen must be explained in order for the TMDL to be approvable. This information is necessary for EPA to determine that the load and wasteload allocations will achieve water quality standards.

In a water impaired solely by nonpoint sources, reasonable assurances that load reductions will be achieved are not required in order for a TMDL to be approvable. However, for such nonpoint source-only waters, States/Tribes are strongly encouraged to provide reasonable assurances regarding achievement of load allocations in the implementation plans described in section 9, above. As described in the August 8, 1997 Perciasepe memorandum, such reasonable assurances should be included in State/Tribe implementation plans and "may be non-regulatory, regulatory, or incentive-based, consistent with applicable laws and programs."

Assessment:

Reasonable assurances that the TMDL will be implemented include both enforcement of regulations, availability of financial incentives and local, state and federal programs for pollution

control. Storm water NPDES permit coverage will address discharges from municipally owned storm water drainage systems. Enforcement of regulations controlling non-point discharges include local implementation of the commonwealth's Wetlands Protection Act and Rivers Protection Act; Title 5 regulations for septic systems and other local regulations such as the Town of Rehoboth's stable regulations. Financial incentives include federal funds available under Sections 319, 604 and 104(b) programs of the CWA, which are provided as part of the Performance Partnership Agreement between MA DEP and EPA. Other potential funds and assistance are available through Massachusetts' Department of Agriculture's Enhancement Program and the United States Department of Agriculture's Natural Resources Conservation Services. Additional financial incentives include income tax credits for Title 5 upgrades and low interest loans for Title 5 septic system upgrades available through municipalities participating in this portion of the state revolving fund program.

11. Public Participation

EPA policy is that there must be full and meaningful public participation in the TMDL development process. Each State/Tribe must, therefore, provide for public participation consistent with its own continuing planning process and public participation requirements (40 C.F.R. § 130.7(c)(1)(ii)). In guidance, EPA has explained that final TMDLs submitted to EPA for review and approval must describe the State/Tribe's public participation process, including a summary of significant comments and the State/Tribe's responses to those comments. When EPA establishes a TMDL, EPA regulations require EPA to publish a notice seeking public comment (40 C.F.R. § 130.7(d)(2)).

Inadequate public participation could be a basis for disapproving a TMDL; however, where EPA determines that a State/Tribe has not provided adequate public participation, EPA may defer its approval action until adequate public participation has been provided for, either by the State/Tribe or by EPA.

Assessment:

A public informational meeting was held on March 4, 2004, to review the findings of the draft TMDL report and to solicit public comment. Approximately 16 persons attended. Comments were accepted through March 15, 2004. DEP has done a commendable job of involving the public during the development of the TMDLs and has provided ample opportunity for the public to comment. Finally, MA DEP has provided a clear record of the comments received and provided clear responses to those comments. Therefore, EPA concludes that MA DEP has adequately responded to the comments raised during the public participation process.

12. Submittal Letter

A submittal letter should be included with the TMDL analytical document, and should specify whether the TMDL is being submitted for a technical review or is a final submittal. Each final TMDL submitted to EPA must be accompanied by a submittal letter that explicitly states that the submittal is a final TMDL submitted under Section 303(d) of the Clean Water Act for EPA review and approval. This clearly establishes the State/Tribe's intent to submit, and EPA's duty to review, the TMDL under the statute. The submittal letter, whether for technical review or final submittal, should contain such information as the name and location of the water body, the pollutant(s) of concern, and the priority ranking of the water body.

Assessment:

On August 23, 2004, MA DEP submitted a final TMDL document for bacteria on the Palmer River Basin for EPA approval. The document contained all of the elements necessary to approve the TMDLs.