



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
Region 1  
1 Congress Street, Suite 1100  
BOSTON, MA 02114-2023

February 5, 2008

Laurie Burt, Commissioner  
Department of Environmental Protection  
1 Winter Street  
Boston, MA 02108

Re: Approval of Phinneys Harbor Embayment System TMDLs for Total Nitrogen

Dear Commissioner Burt:

Thank you for your submission of the TMDL analysis for waters of the Phinneys Harbor Embayment System on Cape Cod. The U.S. Environmental Protection Agency (EPA) has reviewed the document entitled "Final Phinneys Harbor Embayment System Total Maximum Daily Loads for Total Nitrogen" (Report number: MA 95-TMDL-2, Control #245.0). This submission is one among the Massachusetts Estuary Project nutrient TMDLs that have been reviewed by EPA.

It is my pleasure to approve the 1 TMDL and 2 pollution prevention TMDLs for total nitrogen addressed by this submission. EPA has determined, as set forth in the enclosed review document, that these TMDLs 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.

My staff and I look forward to our continued partnership with the MassDEP in exercising our shared responsibility of implementing the requirements under Section 303(d) of the CWA.

If you have any questions regarding this approval, please contact Steve Silva at (617) 918-1561 or have your staff contact Mary Garren at (617) 918-1322 or Mike Hill at (617) 918-1398.

Sincerely,

Stephen S. Perkins, Director  
Office of Ecosystem Protection

Enclosure

cc: Glenn Haas    Dennis Dunn    Stephen Silva  
Gary Moran    Steve Halterman  
Brian Dudley    Mike Hill

## EPA NEW ENGLAND'S TMDL REVIEW

**DATE:** February 5, 2008

**TMDL:** Phinneys Harbor Embayment System TMDLs for Total Nitrogen  
(Report # 95-TMDL-2, CN # 245.0)

**STATUS:** Final

**IMPAIRMENT/POLLUTANT:** 1 TMDL and 2 pollution prevention TMDLs for  
Total Nitrogen

### BACKGROUND:

The Massachusetts Department of Environmental Protection (MassDEP) released a draft TMDL for public review on May 2, 2007. Key stakeholders received copies of the document in the mail. The draft TMDL was posted on the Department's web site on that date as well. A public meeting was held at the Veteran's Community Center in the Town of Bourne on May 30, 2007. The public comment period was extended and comments accepted until June 29, 2007. MassDEP prepared a response to public comment which was submitted along with the final TMDL to EPA. All comments from the public were taken into account in the Response to Comments and the final TMDL submission. The final submission to EPA was sent on November 27, 2007. In addition to the TMDL itself, the submittal included, either directly or by reference, the following additional documents:

- Response to Comments, Draft TMDL Report for the Phinneys Harbor System, MassDEP, draft report dated October 14, 2006.
- Massachusetts Estuaries Project, Linked Watershed-Embayment Model to Determine Critical Nitrogen Loading Thresholds for the Phinneys Harbor, Eel Pond and Back River System, Bourne, Massachusetts. Massachusetts Estuary Project and MassDEP, final report, May 2006.  
[http://www.oceanscience.net/estuaries/PhinneysHbr\\_BackRiver.htm](http://www.oceanscience.net/estuaries/PhinneysHbr_BackRiver.htm)
- Massachusetts Estuaries Project Embayment Restoration and Guidance for Implementation Strategies, MassDEP, 2003.  
<http://www.mass.gov/dep/water/resources/restore.htm>
- Massachusetts Year 2006 Integrated List of Waters, Final Listing of the Condition of Massachusetts' Waters Pursuant to Sections 303(d) and 305(b) of the Clean Water Act, CN 262.1, August 2007.  
<http://www.mass.gov/dep/water/resources/tmdls.htm>

The following review explains how the TMDL submission meets the statutory and regulatory requirements of TMDLs in accordance with § 303(d) of the Clean Water Act and EPA's implementing regulations in 40 CFR Part 130.

**REVIEWER:** Mary Garren, telephone number: (617) 918-1322

## 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 chlorophyll *a* and phosphorus loadings for excess algae.*

The document for the Phinneys Harbor embayment system TMDLs for total nitrogen describes the water body segments and the cause of the impairments. The Phinneys Harbor embayment system consists of Phinneys Harbor, Back River and Eel Pond. The document identifies a total of three segments needing TMDLs. One nutrient impaired segment (Eel Pond) is included on Massachusetts' 2004 and 2006 Clean Water Act (CWA) §303(d) Integrated List. A TMDL for total nitrogen has been calculated for Eel Pond. Two segments (Phinneys Harbor and Back River) were not included on the Massachusetts' Integrated List for nutrient impairment. All three segments are hydraulically connected so two pollution prevention TMDLs for total nitrogen are included here. All three waterbody segments were included on the Massachusetts' 2006 CWA §303(d) Integrated List for impairment by pathogens. Pathogen impairments are not addressed by this TMDL analysis and all three segments will remain on the 303(d) List for pathogens.

Pages 1 to 7 of the Phinneys Harbor TMDL Report for total nitrogen provide an overview of the description and priority ranking of the water bodies, pollutant of concern, and pollutant sources. MassDEP has determined that all nutrient impaired segments in the Commonwealth are a high priority (see Massachusetts Integrated List of Waters at: <http://www.mass.gov/dep/water/priorities/priorities.htm>). The Town of Bourne has also shown that addressing the impairment of the embayment system is a priority for the local community.

*Assessment:*

EPA concludes that the description, pollution sources, pollutant of concern and the priority ranking of the waterbodies provided in the TMDL Report and Integrated List, as described above, are reasonable and consistent with accepted methods used in establishing nutrient TMDLs. Furthermore, EPA concludes that the Phinneys Harbor TMDL document has adequately characterized the Phinneys Harbor embayment system impairments and their causes.

**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.*

The impairments MassDEP has identified are excess nutrients, loss of eelgrass, low dissolved oxygen levels, elevated chlorophyll *a* levels, and benthic fauna habitat degradation (page 3, TMDL document). Eelgrass beds, a critical habitat for macroinvertebrates and fish, have almost disappeared from these waters. In addition, the eelgrass beds in some instances have been replaced by macroalgae. Excess growth of algae in the water and growing on the eelgrass reduces the light available to the eelgrass and contributes to its disappearance. Consequently, macroalgae does not provide high quality habitat for fish and invertebrates. In the Phinneys Harbor embayment system, as in most coastal and marine waters, the nutrient nitrogen above natural conditions, contributes to these undesirable conditions described above – through the promotion of excessive growth of plants and algae including nuisance vegetation, commonly referred to as cultural eutrophication. The TMDL document identifies several provisions of the Commonwealth's water quality standards that are relevant to the cultural eutrophication in these waters, including numeric criteria for dissolved oxygen and narrative criteria for aesthetics and nutrients (page 7, TMDL document). EPA guidance states that individual estuarine and coastal marine waters tend to have unique characteristics and therefore, individual waterbody criteria are typically required. For example, the loading of nitrogen that a specific waterbody can handle without becoming impaired varies. Factors that influence the effect of nitrogen include: flow velocity, tidal hydraulics, dissolved oxygen and sediment adsorption and desorption of nitrogen.

The parameter MassDEP chose to indicate cultural eutrophication caused by excessive nitrogen is the lack of stable eelgrass beds. The habitat of the Phinneys Harbor system is better near the tidal inlet on Buzzards Bay and poorest in the most inland tidal reaches of the Phinneys Harbor segment (page 4, TMDL document). Nitrogen concentrations are highest in the upper watershed and lower towards the ocean. Aerial photography from 1951 indicates that there has been a loss of 95% of the eelgrass beds in Phinneys Harbor over time. Virtually all 88 acres of eelgrass habitat in the outer basin have been lost. Back River and Eel Pond did not support eelgrass habitat during the 1951 survey nor do

they at the present time. Studies, however, show that the benthic habitat in the overall embayment system remains healthy despite the present nitrogen loading conditions.

The inland reaches of the Phinneys Harbor System, the Back River and Eel Pond regions, did not support eelgrass in the 1951 (or 1985) surveys. Often it is the inland reaches that do provide good eel grass habitat in the Cape Cod estuaries. It appears that these particular areas may not be supportive of eelgrass habitat due to the structure of these water bodies. Eel Pond is a kettle pond with relatively deep water (2-3 meters.) This depth is at the limit of what is historically colonized in the Phinneys Harbor basin. Eel Pond will naturally be enriched over the outer basin given its location, structure and hydraulic connection with the Back River (Chapter VI, MEP report). Eelgrass habitat in the Back River salt marshes is not expected given the intertidal nature of the salt marsh creeks.

MassDEP identified a location, referred to as the “sentinel” station, in the Phinneys Harbor system at which attainment of the water quality target at this locality will result in the return of eelgrass beds in the embayment system and attainment of water quality standards (page 12, TMDL document). The sentinel station is located at the mouth of Phinneys Harbor at location PH-4. MassDEP indicates that a water quality target of 0.35 mg/L of total nitrogen at the sentinel station will support eelgrass beds and the secondary criteria of healthy infaunal habitat in the embayment system. MassDEP asserts that attaining the modeled nitrogen target at the sentinel location through implementation of the TMDL will lead to restoration of eelgrass in the embayment system.

*Assessment:*

EPA concludes that Massachusetts has properly presented its numeric water quality standards and has made a reasonable and appropriate interpretation of its narrative water quality criteria for the designated uses of the Phinneys Harbor embayment system. In summary, the use of the Linked Model, the description of the process in the TMDL document and the companion MEP Technical Report adequately demonstrate the basis used to derive the target nitrogen load of 0.35 mg/L at the sentinel station and that this target will achieve water quality standards and designated uses.

### **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.*

The Massachusetts Estuaries Project analytical model is the Linked Watershed-Embayment Management Model (Linked Model). It links watershed inputs with embayment circulation and nitrogen characteristics, and:

- requires site-specific measurements within each watershed and embayment;
- uses realistic “best-estimates” of nitrogen loads from each specific type of land-use;
- spatially distributes the watershed nitrogen loading to the embayment;
- accounts for nitrogen attenuation during transport to the embayment;
- includes a 2D or 3D embayment circulation model depending on embayment structure;
- accounts for basin structure, tidal variations, and dispersion within the embayment;
- includes nitrogen regenerated within the embayment;
- is validated by both independent hydrodynamic, nitrogen concentration, and ecological data; and
- is calibrated and validated with field data prior to generation of additional scenarios.

The Linked Model, as stated in the TMDL document, is a robust and fairly complicated model that determines an embayment's nitrogen sensitivity, nitrogen threshold loading levels (TMDL) and response to changes in the loading rate. A key feature of the approach involves the selection of a sentinel station. Attainment of the water quality target at the sentinel location will result in improved eelgrass habitat throughout the Phinneys Harbor system and achievement of water quality standards. The sentinel station for this embayment system is located at the mouth of Phinneys Harbor. The Phinneys Harbor system is different than many estuaries in that the greatest nitrogen loading and eelgrass loss is found in the outer harbor nearest Buzzards Bay. The inner basins are either naturally nutrient-rich or are depositional basins that are not as conducive to healthy eelgrass habitat. This approach using the Linked Model captures the critical target needed to address the impaired segments.

The loading capacity for each sub-embayment within the Phinneys Harbor embayment system is set out in Tables 4 and 5 of the TMDL document. The target threshold controllable sub-embayment watershed loads in kilograms per day as identified in Table 4 are as follows: Phinneys Harbor, 4.69 kg/day, Back River, 9.63 kg/day, and Eel Pond, 4.89 kg/day. The total loading capacity for each sub-embayment including controllable and uncontrollable sources, such as atmospheric deposition and sediment benthic flux (Table 5, TMDL document) are as follows: Phinneys Harbor, 22 kg/day, Back River, 12 kg/day, and Eel Pond, 5 kg/day. The loading capacity was based on achieving a target total nitrogen concentration of 0.35 mg/L at the sentinel station. The TMDL is based on the worst case scenario which in this case is the summer growing season.

*Assessment:*

The TMDL document explains and EPA concurs with the approach for applying the Linked Model to specific embayments for the purpose of developing daily target nitrogen loading rates and in identifying sources of nitrogen to achieve the total nitrogen targets. EPA believes that this approach is reasonable because the factors influencing and controlling nutrient impairment are adequately identified. Therefore, EPA concludes that the loading capacities have been appropriately set at a level necessary to attain applicable water quality standards and designated uses.

#### **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.*

Using the Linked Model, MassDEP has identified the portion of the loading capacity allocated to existing and future non-point sources necessary to meet water quality standards. These non-point sources are primarily septic systems, natural background, storm water runoff (including nitrogen from fertilizers), wastewater treatment facilities that discharge to groundwater, atmospheric deposition and nutrient-rich sediments. Based on land use, the Linked Model accounts for loading due to storm water, but does not differentiate storm water into a load and wasteload allocation. However, as described below, in the wasteload allocation section, the wasteload (from storm water) is insignificant (less than 0.20%) compared to the total load. The range of nitrogen loads from storm water from the impervious subwatershed buffer area (WLA) to the individual embayments is 0.14-0.40% when compared to the individual nitrogen load in each embayment.

*Assessment:*

EPA concludes that the load allocations are adequately specified for the TMDLs at levels necessary to attain 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.*

EPA interprets 40 CFR 130.2(h) to require that allocations for NPDES regulated discharges of storm water be included in the wasteload component of the TMDL. On Cape Cod the vast majority of storm water percolates into the ground and aquifer and proceeds into the embayment systems through groundwater migration. The Linked Model used in the development of the TMDLs accounts for storm water loadings and groundwater loading in one aggregate load as a non-point source – combining the assessments of wastewater and storm water (including storm water that infiltrates into the soil and direct discharge pipes into water bodies) for the purpose of developing control strategies. Although the vast majority of storm water percolates into the ground in the Phinneys Harbor embayment system, there are some storm water pipes or other conveyances that discharge directly to waterbodies and are subject to the requirements of the Phase II Storm Water NPDES Program. The Town of Bourne is largely covered under the Phase II General Permit for Storm water Discharges from Municipal Separate Storm Water Sewer Systems (MS4s) for its urbanized areas. The Town has elected to require that the non-urbanized area within its boundaries also be subject to the Phase II Permit. The loadings allocated to these storm water discharges must be treated as a wasteload allocation. Since the majority of the nitrogen loading comes from septic systems, fertilizer and storm water that infiltrates the ground into the groundwater, the allocation of nitrogen for any storm water point sources that discharge directly to any of the embayments is insignificant as compared to the overall groundwater load (see Appendix C.)

Based on land use, the Linked Model accounts for loading of storm water, but does not explicitly breakout storm water into a load and wasteload allocation. Based on the fact that there are some storm water discharge pipes or other conveyances within NPDES



Phase II area that discharge directly to embayments or waters that are connected to the embayments, the wasteload allocation for these sources was determined for each sub-embayment and ranges from 0.14 to 0.40% (compared to the total nitrogen load to each sub-embayment.) The WLA is derived from the percent of impervious surface within 200 feet of the waterbodies and the relative load from this area compared to the overall load within each sub-embayment. Although most storm water infiltrates into the ground on Cape Cod, some impervious areas within approximately 200 feet of the shoreline may discharge storm water via pipes or other conveyances directly to the waterbody. For the purposes of wasteload allocation, it was assumed that all impervious surfaces within 200 feet of the shoreline discharge directly to the waterbody whether or not they actually do so. The specific WLA are set forth on pages 15 and 16 and Appendix C of the TMDL document.

Although the loading contribution from the point source discharges is insignificant (0.20% or 26 kg/year) compared to the non-point sources, the point source discharges are subject to the Phase II Storm Water NPDES Program and their collective load is to be treated as a WLA.

*Assessment:*

EPA concludes that the wasteload allocation for the point sources is adequate. Furthermore, the loading contribution from the point discharges is insignificant (0.20% or 26 kg/year) compared to the input from non-point sources. The overall nitrogen load to the embayment system, in comparison, is 12,903 kg/year. Nonetheless, these point discharges are subject to the Phase II Storm Water NPDES Program and are to be treated as a wasteload allocation. In the absence of site specific information on direct discharge sources, EPA believes the approach set out in the TMDL for the WLAs is reasonable.

## **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.*

The implicit margin of safety is set out in the TMDL document on pages 17 and 18. There are several factors that contribute to the margin of safety inherent in the approach used to develop these TMDLs including: 1) the Linked Model uses attenuation factors that are lower than those that were actually measured; 2) the selection of the threshold site and nitrogen concentrations were based on stable eelgrass beds or benthic (infaunal) communities, not those starting to show impairment which would have resulted in higher nitrogen concentrations; and 3) the future nitrogen fluxing from sediments is overestimated.

*Assessment:*

EPA concludes that the margin of safety for the TMDL is reasonable.

## **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)).*

The TMDLs for the waterbody segments identified in the document are based on achieving the nitrogen loads during the most critical time period, i.e. the summer growing season (page 18, TMDL document.)

*Assessment:*

Since the other seasons are less sensitive to nitrogen loading than the summer growing season, EPA concludes that the TMDL for each waterbody segment is protective of all seasons throughout the year.

## **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), and EPA's 2006 guidance, Clarification Regarding "Phased" Total Maximum Daily Loads, recommend a monitoring plan when a TMDL is developed using the phased approach. The guidance indicates that a State may use the phased approach for situations where TMDLs need to be developed despite significant data uncertainty and where the State expects that the loading capacity and allocation scheme will be revised in the near future. EPA's guidance provides that a TMDL developed under the phased approach should include, in addition to the other TMDL elements, a monitoring plan that describes the additional data to be collected and a scheduled timeframe for revision of the TMDL.*

Because these TMDLs are not "phased" TMDLs, a monitoring plan is not required. Nevertheless, in order to assess the progress in obtaining the TMDLs' water quality goals, MassDEP has recommended that the Town of Bourne establish a detailed post-TMDL monitoring plan as set out on page 21 of the TMDL document. EPA recommends that MassDEP and the town work together to develop and implement such a plan. In addition, MassDEP is committed to monitoring the Phinneys Harbor embayment system every five years as part of conducting its ongoing water quality assessments in each watershed in Massachusetts.

*Assessment:*

EPA concludes that the anticipated monitoring by and in cooperation with MassDEP is sufficient to evaluate the adequacy of progress toward attainment of water quality standards and designated uses, although not a required element of EPA's TMDL approval process.

## **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.*

The implementation plan for the total nitrogen TMDL for the Phinneys Harbor embayment system is described on pages 19 and 20 of the TMDL document and strategies for reducing nitrogen loading are set out in MassDEP's MEP Implementation Guidance report which can be found at: <http://www.mass.gov/dep/water/resources/restore.htm>. The watershed for the Phinneys Harbor system includes the Town of Bourne and a small portion of the Town of Sandwich. MassDEP advises that implementation planning should be coordinated with the Town of Sandwich. In addition, Town of Bourne is developing its Comprehensive Wastewater Management Plan (CWMP). Towns have latitude in considering various implementation scenarios such as land use planning and controls, sewerage and treatment for nitrogen control of sewage and storm water control and treatment.

*Assessment:*

EPA acknowledges that the TMDL document includes an implementation plan. EPA does not approve this component of any TMDL submission.

## **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."*

The Commonwealth has statutory and regulatory authority to encourage implementation of these TMDLs, as explained on pages 21-22 of the TMDL document. In addition, the Town of Bourne has demonstrated its commitment to implement these TMDLs through the comprehensive wastewater planning that it initiated well before the generation of these TMDLs. These town expects to use the information in these TMDLs to generate support from its citizens to take the necessary steps to remedy existing problems related to nitrogen loading from septic systems, storm water, and runoff (including fertilizers),

and to prevent any future degradation of these valuable resources.

*Assessment:*

Reasonable assurance is not necessary for these TMDLs to be approvable, since the point sources are not given less stringent wasteload allocations based on projected non-point source load reductions. EPA, however, concludes that the TMDL document offers reasonable assurances that the TMDLs will be implemented.

## **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.*

MassDEP publicly released a draft on the TMDL on May 2, 2007. A public meeting was held on May 30, 2007 to provide information and solicit comments. The public comment period closed on June 29, 2007. MassDEP submitted a Response to Comments to EPA along with the final TMDL submission on November 27, 2007.

*Assessment:*

EPA concludes that MassDEP has done a sufficient job of involving the public in the development of the TMDL, provided adequate opportunities for the public to comment and has fully addressed the comments received as set forth in the response to comment document accompanying TMDL document.

## **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 waterbody, the pollutant(s) of concern, and the priority ranking of the waterbody.*

On November 27, 2007, MassDEP submitted a final TMDL for total nitrogen on the Phinneys Harbor embayment system for EPA approval.

*Assessment:*

The final document contained all of the elements necessary to approve the TMDLs.

## Attachment 1

### 3 Total Nitrogen TMDLs Addressed In Document

<b>Phinneys Harbor System Sub-Embayment</b>	<b>Segment Identification Based On 2002 Integrated List</b>	<b>Description</b>	<b>TMDL (kg/day)</b>
Phinneys Harbor	MA95-15_2004	From the confluence with the Back River, to the mouth of Buzzards Bay (demarcated by a line from the southeastern point of Mashpee Island to the northwestern point of Toby Island), Bourne	22 (Pollution Prevention TMDL)
Back River	MA95-47_2004	Outlet of small unnamed pond downstream from Mill Pond, Bourne to confluence with Phinneys Harbor, (excluding Eel Pond), Bourne	12 (Pollution Prevention TMDL)
Eel Pond	MA95-48_2004	Salt water pond that discharges to the Back River, Bourne	5

<b>Data for entry in EPA's National TMDL Tracking System</b>							
TMDL Name *		Phinneys Harbor Embayment System					
Number of TMDLs*		1					
Type of TMDLs*		Nutrients					
Number of listed causes (from 303(d) list)		1					
Information/prevention TMDLs, Y/N? (#)		Yes (2)					
Lead State		Massachusetts					
TMDL Status		Final					
<b>Individual TMDLs listed below</b>							
<b>TMDL sub-embayments systems and segment names</b>	<b>TMDL Segment ID #</b>	<b>TMDL Pollutant ID# &amp; name</b>	<b>TMDL Impairment Cause(s)</b>	<b>Pollutant endpoint</b>	<b>Unlisted?</b>	<b>NPDES Point Source &amp; ID#</b>	<b>Listed for something else?</b>
Eel Pond	MA95-48_2004	511 (Total Nitrogen)	Nutrients	5 kg/day TN			yes, pathogens
<b>303(d)3 Pollution Prevention TMDLs</b>							
Phinneys Harbor	MA95-15_2004	511 (Total Nitrogen)	Nutrients	22 kg/day TN	Not listed for nutrients		yes, pathogens
Back River	MA95-47_2004	511 (Total Nitrogen)	Nutrients	12 kg/day TN	Not listed for nutrients		yes, pathogens
TMDL Type		Nonpoint & MS4 Point Source					
Establishment Date (approval)*		Feb 5, 2008					
EPA Developed		No					
Towns affected*		Bourne and Sandwich, MA					