



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

November 7, 2007

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

Re: Approval of Quashnet River, Hamblin Pond, Little River, Jehu Pond, and Great River in the Waquoit Bay System TMDLs for Total Nitrogen

Dear Commissioner Burt:

Thank you for your submission of the TMDL analysis for waters within three sub-embayments in the Waquoit Bay System on Cape Cod. The U.S. Environmental Protection Agency (EPA) has reviewed the document entitled "Final Quashnet River, Hamblin Pond, Little River, Jehu Pond, and Great River in the Waquoit Bay System Total Maximum Daily Loads for Total Nitrogen" (Report number: MA 96-TMDL-5, Control #218.0). This submission is one among the Massachusetts Estuary Project nutrient TMDLs that have been reviewed by EPA. We are pleased with the continued progress the State has made in developing a comprehensive suite of TMDLs for Massachusetts estuaries.

It is my pleasure to approve the 5 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 continued cooperation 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    Brian Dudley    Steve Halterman  
Gary Moran    Dennis Dunn    Stephen Silva

## EPA NEW ENGLAND'S TMDL REVIEW

**DATE:** November 7, 2007

**TMDL:** Quashnet River, Hamblin Pond, Little River, Jehu Pond, and Great River in the Waquoit Bay System TMDLs for Total Nitrogen (Report # 96-TMDL-5, Control # CN218.0)

**STATUS:** Final

**IMPAIRMENT/POLLUTANT:** 5 TMDLs for Total Nitrogen; 5 segments in 3 sub-embayments on the 2002 and 2004 CWA § 303(d) list; (See Attachment 1)

### BACKGROUND:

The Massachusetts Department of Environmental Protection (MassDEP) released a draft TMDL for public review on June 27, 2005. 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 Waquoit Bay National Estuarine Research Reserve on July 28, 2005. The public comment period was extended and comments accepted until August 11, 2005. 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 February 10, 2006. 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 Quashnet River, Hamblin Pond, Little River, Jehu Pond and Great River, MassDEP, January 31, 2006 revision.
- Massachusetts Estuaries Project, Linked Watershed-Embayment Model to Determine Critical Nitrogen Loading Thresholds for Quashnet River, Hamblin Pond, and Jehu Pond in the Waquoit Bay System in the Towns of Mashpee and Falmouth, Massachusetts. Massachusetts Estuary Project and MassDEP, final report, April 2005. [http://www.oceanscience.net/estuaries/report/Quashnet/Quashnet\\_MEP\\_Final\\_Report.pdf](http://www.oceanscience.net/estuaries/report/Quashnet/Quashnet_MEP_Final_Report.pdf)
- 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, proposed listing of the condition of Massachusetts' waters pursuant to Sections 303(d) and 305(b) of the Clean Water Act (CN 262.20), April 2006. <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 Quashnet River, Hamblin Pond, Little River, Jehu Pond, and Great River in the Waquoit Bay System TMDLs for Total Nitrogen adequately describes the water body segments, nature and cause or threat of the impairments. Impairments include loss of eelgrass beds, increased algae and algae blooms, low dissolved oxygen levels and reduced benthic animal diversity. The TMDLs identify excess total nitrogen originating primarily from on-site wastewater disposal as the cause of the impairments. The document identifies a total of 5 segments needing a TMDL to address nutrient, specifically nitrogen, impairment. Each waterbody segment is impaired for total nitrogen and included on Massachusetts' 2002, 2004 and 2006 Clean Water Act (CWA) §303(d) list (List). Hamblin Pond, Little River, and Quashnet River are also impaired for pathogens and will remain on the List for those impairments.

The 5 segments comprise three sub-embayments of Waquoit Bay. They are the Hamblin Pond/Little River, Jehu Pond/Great River, and Quashnet River sub-embayments. Pages 1 to 8 of the TMDL for total nitrogen provide a good overview of the description and priority ranking of the waterbodies, 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>).

#### *Assessment:*

EPA New England concludes that the TMDL document meets the requirements for describing

the waterbody segments, pollutants of concern, identifying and characterizing sources of impairment, and priority ranking.

## **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 anti-degradation 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 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. 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 Waquoit Bay sub-embayments. As stated on pages 8 and 9 of the TMDL document and EPA guidance, 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 Massachusetts Estuaries Project analytical method 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 N 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.

Sentinel locations were identified in each of the three sub-embayments as locations at which restoration will necessarily result in high quality habitat throughout the system and attainment of water quality standards (page 13 of the TMDL document). The sentinel location with the Quashnet River estuary is located within the upper/mid basin. The sentinel locations within the Hamblin Pond/Little River and Jehu Pond/Great River estuaries are in the pond basins.

Attaining the modeled nitrogen targets at the sentinel locations through implementation of the TMDL will lead to restoration of eelgrass and infaunal habitats in each of the sub-embayments. The target threshold nitrogen concentrations which have been determined to be protective for each embayment system, as measured at the appropriate sentinel stations, are presented in Table 2 (page 12 of the TMDL document) and range from 0.38 – 0.50 mg/L. These concentrations, which represent the average water column concentration of nitrogen, will restore or maintain high habitat quality in these embayments.

In summary, the use of the Linked Model, the description of the process in the TMDL document and the companion Technical Report to this TMDL document adequately demonstrate the basis for deriving the target nitrogen loads and demonstrating that the targets will achieve water quality standards.

*Assessment:*

EPA New England concludes that MassDEP has properly presented its water quality standards, and has made a reasonable interpretation of its water quality standards for the designated uses of the Waquoit Bay embayment system. The use of the Linked Model, the description of the process in the TMDL document, and the companion Technical Report to this TMDL document adequately demonstrate the basis for deriving the target nitrogen loads and demonstrating that the targets will achieve water quality standards. 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 Quashnet River, Hamblin Pond, Little River, Jehu Pond, and Great River in the Waquoit Bay system.

### **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 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 sentinel sub-embayments that have the poorest water quality in the embayment system (see Section 2 above). If these degraded areas come into compliance with the TMDL, other areas will also achieve water quality standards for nitrogen in the system. This approach captures the critical targets needed to address the impaired segments.

Percent reductions of existing nitrogen loads necessary to meet the target threshold loads range from 38% in the Upper Quashnet River to up to 80% in the Lower Great River. These loads represent one scenario using the Linked Model. The TMDL value for each sub-embayment represents the sum of the calculated target threshold load (from controllable watershed sources), atmospheric deposition load, and benthic flux load from sediment sources. TMDLs range from 2 kg/day in Little River/Hamblin Pond, 25 kg/day in Great River/Jehu Pond, and to 27 kg/day in the Quashnet River (pages 15-16 and pages 21-22 of the TMDL document).

*Assessment:*

The TMDL document explains and EPA concurs with the approach for applying the Linked Model to specific embayments for the purpose of developing target nitrogen loading rates and in identifying sources of needed nitrogen load reduction. EPA believes that this approach is reasonable because the factors influencing and controlling nutrient impairment were well justified.

#### **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. Additional nitrogen sources include natural background, stormwater runoff (including nitrogen from fertilizers), atmospheric deposition, and nutrient-rich sediments.

Mass DEP adequately describes and sets forth the load allocations for cultural and natural background sources (See pages 18-19 of the TMDL document). EPA concludes that the load allocations are adequately specified for the TMDLs at levels necessary to attain water quality standards.

*Assessment:*

EPA concludes that the TMDL document sufficiently addresses the calculation of the load allocations.

## **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 waste load 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 Mashpee and Falmouth, 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 loadings allocated to such storm water discharges must be treated as a waste load 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.

Based on land use, the Linked Model accounts for loading of storm water, but does not explicitly breakout storm water into a load and waste load allocation. The draft TMDLs had lumped all storm water into the LA. EPA alerted MassDEP that any storm water subject to the Phase II Storm Water NPDES requirements must be considered as a WLA. Consequently, MassDEP evaluated the likely contribution of this load to the WLA. Based on the fact that there are some storm water discharge pipes or other conveyances within NPDES Phase II area discharging directly to embayments or waters that are connected to the embayments, the waste load allocation was determined for each sub-embayment to be less than 0.33% (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 waste load 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. 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. The specific WLA are set forth in Appendix C and on pages 17 and 18 of the TMDL document.

Although the loading contribution from the point source discharges is insignificant (less than 1%) 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. 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.

#### *Assessment:*

EPA concludes that the TMDL document sufficiently addresses the calculation of the waste load allocations.

## **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 19 to 21. There are several factors that contribute to the margin of safety inherent in the approach used to develop these TMDLs including:

### **1) Use of conservative data in the Linked Model as follows:**

- Attenuation factors used were lower than those that were actually measured;
- Agreement between the modeled and observed values has been >95%;
- The use of sentinel stations that are the furthest inland to set the nitrogen load is conservative because the rest of the embayment is closer to the mouth of the estuary and will have lower nitrogen concentrations because of a greater tidal flux; and
- Future nitrogen fluxing from sediments is overestimated.

**2) Conservative sentinel station/target threshold nitrogen concentrations.** Sites were chosen that had stable eelgrass or benthic (infaunal) communities, not those starting to show impairment, which would have resulted in higher nitrogen concentrations.



3) **Conservative approach.** Target loads were based on averaged nitrogen concentrations on the outgoing tide. This is the worst case scenario because this is when the nitrogen concentrations are highest. Nitrogen concentrations will be lower on the flood tides, due to dilution from the incoming tide.

*Assessment:*

EPA concludes that the implicit margin of safety for the TMDL is acceptable.

## **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. Since the other seasons are less sensitive to nitrogen loading, the TMDL is protective of all seasons throughout the year. Seasonal variation is addressed on page 21 of the TMDL document.

*Assessment:*

Since the other seasons are less sensitive to nitrogen loading, EPA concludes that the TMDLs are 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 in order to assure that nonpoint source reductions are necessary. Nevertheless, in order to assess the progress in obtaining the TMDLs' water quality goals, MassDEP has recommended that the Towns of Mashpee and Falmouth establish a detailed post-TMDL monitoring plan consistent with the Comprehensive Wastewater Management Planning process and implementation of the TMDLs. EPA recommends that MassDEP and the town work together to develop and implement such a plan (page 23 of the TMDL document).

*Assessment:*

EPA New England concludes that the anticipated monitoring by and in cooperation with MassDEP is sufficient to evaluate the adequacy of the TMDL and attainment of water quality standards, although not a required element for TMDL approval.

## **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 TMDLs for sub-embayments in the Waquoit Bay System is described on pages 22 and 23 of the TMDL document. EPA concludes that the approach taken by MassDEP is reasonable because of the resources available to the towns to address nitrogen such as the Comprehensive Wastewater Management Plan, additional linked model runs at nominal expense, assessment of cost-effective options for reducing loadings from individual on-site subsurface wastewater disposal systems, land use planning and controls, water conservation, and storm water control and treatment. Parts of the Town of Sandwich are in the upper watershed of the Waquoit Bay sub-embayments. MassDEP advises that the development of an implementation plan will require coordination between Falmouth, Mashpee and Sandwich to maximize loading reductions. MassDEP advised the towns to incorporate the nitrogen loading reduction strategies outlined in the Massachusetts Estuaries Implementation Guidance report (<http://www.mass.gov/dep/water/resources/restore.htm>) into the implementation plans.

*Assessment:*

MassDEP has addressed the implementation plan, although it is not required. EPA is taking no action on the implementation plan.

## **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. In addition, Mashpee and Falmouth have demonstrated their commitment to implement these TMDLs through the comprehensive wastewater planning that it initiated well before the generation of these TMDLs. The towns expect 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 nonpoint source load reductions. MassDEP has provided reasonable assurance that water quality standards will be met.

## **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 announced the development of the draft TMDL on June 27, 2005. A public meeting was held on July 28, 2005 for information and solicitation of comments. The public comment period closed on August 11, 2005. MassDEP submitted a response to comments to EPA along with the final submission on February 10, 2006. Therefore, EPA concludes that MassDEP has adequately responded to the comments raised during public participation.

*Assessment:*

EPA concludes that MassDEP has involved the public during the development of the TMDL, has provided adequate opportunities for the public to comment on the TMDL, and has provided reasonable responses to the public comments.

## **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 February 10, 2006, MassDEP submitted a final TMDL for total nitrogen on the Quashnet River, Hamblin Pond, Little River, Jehu Pond, and Great River in the Waquoit Bay system for EPA approval. The final TMDL contained revisions based upon public comments and EPA's comments dated April 11, 2005. The latest document contained all of the elements necessary to approve the TMDL.

*Assessment:*

MassDEP's letter of February 10, 2006 states that the TMDL is being formally submitted for EPA review and approval.

**Attachment 1**  
**5 Total Nitrogen TMDLs in the Waquoit Bay System, Cape Cod**

<b>Sub-embayments and waterbody segments</b>	<b>Segment ID</b>	<b>Waterbody segment description</b>	<b>TMDL Kg/day TN</b> (Rounded Off Total See Page 21 of Document)
<b>Quashnet River sub-embayment</b>			
Quashnet River	MA-96-20_2002	Just south of Route 28 to mouth at Waquoit Bay, Falmouth. Also known as Moonakis River.	<b>27 kg/day</b>
<b>Hamblin Pond/Little River sub-embayment</b>			
Hamblin Pond	MA96-58_2002	From inlet of Red Brook to outlet of Little River and inlet/outlet of Waquoit Bay west of Meadow Neck Road, Falmouth/Mashpee	<b>2 kg/day</b> (this is linked to the Little River TMDL below)
Little River	MA-96-61_2002	From outlet of Hamblin Pond to the Great River, Mashpee	<b>2 kg/day</b> (this is linked to the Hamblin Pond TMDL above)
<b>Jehu Pond/Great River sub-embayment</b>			
Jehu Pond	MA96-59_2002	Mashpee	<b>25 kg/day</b> (this is linked to the Great River TMDL below)
Great River	MA96-60_2002	From the inlet of Abigail's Brook to Waquoit Bay (excluding Jehu Pond), Mashpee	<b>25 kg/day</b> (this is linked to the Jehu Pond TMDL above)

<b>Data for entry in EPA's National TMDL Tracking System</b>							
TMDL Name *		Quashnet River, Hamblin Pond, Little River, Jehu Pond, and Great River in the Waquoit Bay System					
Number of TMDLs*		5 *					
Type of TMDLs (Pollutant)*		Nutrients (Nitrogen)					
Number of listed causes (from 303(d) list)		6					
Information/prevention TMDLs, Y/N? (#)		N					
Lead State		Massachusetts					
TMDL Status		Final					
<b>Individual TMDLs listed below</b>							
TMDL sub-embayments systems and segment names	TMDL Segment ID #	TMDL Pollutant ID# & name	TMDL Impairment Cause(s)	Pollutant endpoint	Unlisted?	NPDES Point Source & ID#	Listed for something else?
<b>Quashnet River sub-embayment</b>							
Quashnet River	MA-96-20_2002	511 (Total Nitrogen)	Nutrients, Organic enrichment/low DO	27 kg/day TN	Listed		pathogens
<b>Hamblin Pond/Little River sub-embayment</b>							
Hamblin Pond	MA96-58_2002	511 (Total Nitrogen)	Nutrients	2 kg/day TN (link to Little River below)	Listed		pathogens
Little River	MA-96-61_2002	511 (Total Nitrogen)	Nutrients	2 kg/day TN (link to Hamblin Pond above)	Listed		pathogens
<b>Jehu Pond/Great River sub-embayment</b>							
Jehu Pond	MA96-59_2002	511 (Total Nitrogen)	Nutrients	25 kg/day TN (link to Great River below)	Listed		no
Great River	MA96-60_2002	511 (Total Nitrogen)	Nutrients	25 kg/day TN (link to Jehu Pond above)	Listed		no
TMDL Type		Nonpoint & MS4 Point Source					
Establishment Date (approval)*		Nov 7, 2007					
EPA Developed		No					
Towns affected*		Mashpee, Falmouth and Sandwich, MA					

**Attachment 2**