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

June 2, 2008

Alicia Good, Assistant Director of Water Resources
Rhode Island Department of Environmental Management
Office of Water Resources
235 Promenade Street
Providence, RI 02908

SUBJECT: **Approval of Sands Pond TMDL**

Dear Ms. Good:

Thank you for your submission of Rhode Island's Total Maximum Daily Load (TMDL) for Sands Pond, New Shoreham, RI, for phosphorus. This water body was included on the State's 2006 303(d) list and was prioritized for TMDL development. The purpose of this TMDL for Rhode Island waters is to address nutrient-related impairments to public drinking water supply use and aquatic life use from nonpoint source pollution.

The U.S. Environmental Protection Agency (EPA) hereby approves Rhode Island's TMDL for Sands Pond, received by EPA on April 9, 2008. EPA has determined that this TMDL meets the requirements of §303(d) of the Clean Water Act (CWA), and of EPA's implementing regulations (40 CFR Part 130). Attached is a copy of our approval documentation.

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

If you have any questions, please contact Stephen Silva (617-918-1561) or Steven Winnett (617-918-1687) of my staff.

Sincerely,

/s/

Stephen S. Perkins, Director
Office of Ecosystem Protection

cc Angelo Liberti, RI DEM
Elizabeth Scott, RI DEM
Kristen Chantrell, RI DEM
Stephen Silva, EPA
Steven Winnett, EPA

EPA NEW ENGLAND'S TMDL REVIEW

TMDL: **Sands Pond, Rhode Island**

Location: Town of New Shoreham, RI

STATUS: Final

IMPAIRMENT/POLLUTANT: Sands Pond is impaired for phosphorus, excess algal growth/chlorophyll-a, turbidity and taste and odor. The pond is designated Class AA, for drinking water supply. A TMDL submission is presented for total phosphorus. The State believes that limits on phosphorus will address the other, nutrient-related impairments.

BACKGROUND: The Rhode Island Department of Environmental Management (RI DEM) submitted to EPA New England the final Total Maximum Daily Load Analysis for Sands Pond, New Shoreham (Block Island), Rhode Island (the "TMDL," "submission," or "Report") with a transmittal letter dated April 9, 2008. EPA submitted comments to RI DEM on March 12, 2008 in response to the February 2008 draft TMDL report, and RI DEM addressed those comments in its final TMDL.

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.

REVIEWERS: Steven Winnett (617-918-1687) E-mail: winnett.steven@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 Water Body, Pollutant of Concern, Pollutant Sources and Priority Ranking

The TMDL analytical document must identify the water body as it appears on the State/Tribe's 303(d) list, the pollutant of concern and the priority ranking of the water body. 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.

Sands Pond is located in New Shoreham (Block Island), RI, approximately 8 nautical miles off the southern coast of RI, at the eastern end of Long Island Sound. The Report describes the pollutant of concern, total phosphorus. The Report lists the water body as it appears on the State's 2006 303(d) list (TMDL pp.3), and explains that it is a high priority for TMDL development (TMDL p.3). The document also describes the TMDL study area and its land uses (TMDL pp. 7-11).

The submission includes a discussion of the condition of the water body, the nonpoint sources and loads that contribute to the water quality impairments, as well as a discussion of the water monitoring and data that indicate the condition of the water body (TMDL pp. 12-27). The major sources of pollution to the watershed include waterfowl, atmospheric deposition, and groundwater flow. There appears to be no overland flow into the water body, nor any point source discharges of any sort, permitted or unpermitted.

Assessment: RI DEM has adequately identified the water body, the pollutant of concern, and the magnitude and location of the sources of pollution.

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 water body, 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.

Sands Pond is designated as a source of drinking water supply and is classified as a Class AA water body. It is impaired by phosphorus, excess algal growth/chlorophyll-a, turbidity, and taste and odor (TMDL, page 3). RI DEM's goals for the TMDL are to:

- Reduce algal abundance (chlorophyll-a) and turbidity concentrations to levels consistent with the use of the water body as a drinking water supply;
- Eliminate drinking water Taste and Odor problems by reducing algal abundance; and
- Reduce average Total Phosphorus concentration in the pond to 25 ug/l (0.025 mg/l).

The numeric water quality target is set at the appropriate numeric water quality standard for phosphorus (TMDL p. 38). The pond is classified as Class AA (TMDL, page 4). Rhode Island has both a numeric and narrative standard for phosphorus (RI Water Quality Regulations: Rule 8.D.(2)(10)(a) and (b), respectively), which includes that average total phosphorus shall not exceed 0.025 mg/l (25.0 ug/l), and allows for lower levels as determined by the Director of RI DEM as necessary to prevent cultural eutrophication (TMDL pp. 4-5). RI also has criteria for taste and odor, and color and turbidity (TMDL p. 5). As Sands Pond is designated as a drinking water supply, it is also identified as a Special Resource Protection Water (SRPW) in the water quality standards, and is afforded extra protection with a prohibition against any measurable degradation of the existing water quality.

RI DEM has established a total phosphorus target of 25 ug/l (0.025 mg/l) for Sands Pond. State Water Quality regulations specify turbidity shall not exceed 5 NTU above background levels. With the background turbidity set at 2.74 NTU, the target for turbidity is set at 7.74 NTU. The goal for chlorophyll-a levels is 10 ug/l.

DEM is confident that controlling phosphorus should bring the other indicators into compliance with the State's standards.

Assessment: EPA New England concludes that RI DEM has properly presented its water quality standard when setting a numeric water quality target.

3. Loading Capacity - Linking Water Quality and Pollutant Sources

As described in EPA guidance, a TMDL identifies the loading capacity of a water body 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 water body'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 water body 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 water body 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.

RI DEM set the numeric water quality target at the applicable water quality criteria as outlined in the TMDL report.

RI DEM describes the methods used to establish the cause-and-effect relationship between the numeric target (WQS) and the significant, identified pollutant sources. The current loadings for groundwater (p. 22), atmospheric deposition (p. 24), and waterfowl (p. 24) were developed through data and literature values. Atmospheric deposition is estimated for both dry and wet deposition. DEM also discusses the internal cycling and net settling of phosphorus (p. 25).

Water column concentrations in the pond appear to be balanced, between external sources and internal settling losses of phosphorus. There is a net loss of internally cycled phosphorus to the sediments, net of remineralization (re-release) of inorganic phosphorus from the sediments and settling to the sediments.

The analysis indicated that a 33% reduction in pond's phosphorus load would be necessary to meet the TMDL goals (including an explicit 10% margin of safety). DEM considers the external sources to be small, more representative of natural background conditions than controllable sources, and with little opportunity to be further reduced by control actions. Therefore, DEM considers that an increase in the phosphorus settling rate of 59% (2.96 m/yr to 4.7 m/yr) would reduce the water column concentration to the TMDL target value of 22.5 ug/l. That corresponds to the TMDL load target of 3.9 kg/yr.

RI DEM applied the load reductions to the TMDL as discussed below in the Load Allocation section. They applied no allocation for future growth as legal restrictions on additional septic systems effectively ensure no significant increase in that source is possible.

The daily load is the annual load divided by 365.

Assessment: EPA New England concludes that the loading capacities, having been calculated using observed data and literature values, and water quality targets consistent with or more stringent than numeric water quality criteria, have been appropriately set at

levels necessary to attain and maintain applicable water quality standards. The TMDL (3.9 kg/yr, or 0.011 kg/day) is based on a reasonable approach for establishing the relationship between pollutant loading and water quality.

4. Load Allocation (LA)

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.

The submission contains a load allocation (LA) that is back-calculated from the TMDL and margin of safety (MOS). The WLA and AFG (allocation for future growth) are both zero.

The usual TMDL equation is TMDL = WLA + LA + AFG + MOS. The WLA and LA are the targets for implementation for NPDES regulated sources (WLA) and non-NPDES regulated sources (LA). For this TMDL, RIDEM used the following equation, which makes the TMDL the target for the implementation program: TMDL = WLA + LA + AFG – MOS.

Consequently, in this case, the TMDL is the sum of the allowable loads from groundwater flow, dry and wet atmospheric deposition, and inputs from waterfowl. The existing loads from these sources were determined through data and literature values. Necessary reductions were determined by comparing the existing concentration to the target concentration, and applying that reduction to the existing load. The TMDL and LA are expressed as targets load in kg/year and in kg/day (TMDL pp. 29-30).

RI DEM then set the LA to 4.33 kg/yr, or 0.012 kg/day, by adding the MOS to the TMDL.

Assessment: EPA New England concludes that load allocation is adequately specified in the TMDL.

5. Wasteload Allocation (WLA)

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.

The submission contains no waste load allocation (WLA) as there are no permitted, wastewater point sources in the TMDL study area, nor any flow from point sources, permitted or unpermitted. There is no stormwater flow to the pond. Historically, the treatment plant which used the pond as a drinking water source, pumped water out of wells and into the pond. Also, the facility would release filter backwash into the pond periodically. Both of these practices have been discontinued, and the pond is no longer used as a source of public drinking water.

Assessment: EPA New England concludes that a WLA of zero (0) for this submission is acceptable and reasonable, as there are no point sources or stormwater flows to the water body.

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.

An explicit MOS of 10% is included in the TMDL for phosphorus loads, which sets a water quality target for this water body 10% lower than required by the State's numeric water quality standard for phosphorus (TMDL pp. 28-29).

Assessment: EPA New England concurs that an adequate MOS is provided by the explicit 10% MOS for phosphorus.

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).

This TMDL addresses seasonal variation because the required reduction in phosphorus was calculated for the conditions during the critical season for algae growth, turbidity and low dissolved oxygen, summer and early fall. Therefore, the TMDL allocation protects designated uses during the entire year.

Assessment: EPA New England concludes that seasonal variations have been adequately accounted for as the TMDL was developed to be protective during the critical period for phosphorus, and will therefore be more than adequately protective during the other seasons.

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.

This is not a phased TMDL but the document includes a description of a monitoring plan. The TMDL proposes continuing monitoring to ensure that water quality improvement activities are adjusted as monitoring indicates changes in the water quality of the pond. RI DEM briefly discusses a monitoring plan in the TMDL report that includes the participation of the Block Island Water Company, RI Department of Health, and a potential local watershed group (TMDL p. 37).

Assessment: Addressed, though not required.

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.

An implementation plan is provided in the submission (TMDL pp. 32-35) which specifically addresses the major identified, controllable sources of pollution and gives specific recommendations for abating them. The plan discusses several types of specific corrective actions, including good housekeeping practices, internal phosphorus controls, and measures to control waterfowl.

Assessment: Addressed, though 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 body 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."

Reasonable assurance is not required because there are no point sources to be given less stringent wasteload allocations based on the assumption of future nonpoint source load reductions.

Assessment: Although not required, reasonable assurance is addressed in the implementation plan. RI DEM's work with its watershed partners, backed up by its regulatory authority, provide reasonable assurance.

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.

RI DEM summarizes its public participation in the TMDL report (TMDL p. 36). RI DEM met initially with town and water company staff to get a history of the pond as part of the TMDL development process. During the monitoring of the pond, the public was kept informed of the TMDL process by the local press.

RI DEM presented the draft TMDL to the public, including the New Shoreham Water Board and the Block Island Town Council, at a meeting on December 13, 2007. Comments received at the meeting were incorporated into the TMDL. The meeting began the 30-day comment period. For the final draft, the agency received one comment

letter during the public comment period, from EPA. The TMDL submission includes a copy of EPA's submitted comments and the Department's responses to it..

Assessment: EPA New England has reviewed the agency's responses to EPA's comments. EPA concludes that RI DEM involved the public during the development of the *Sands Pond TMDL*, has provided adequate opportunities for the public to comment on the TMDL, and has provided reasonable responses to the comments received.

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.

Comment: RI DEM's letter of April 9, 2008 stated that the TMDL is being formally transmitted for EPA approval.

Data for entry in EPA's National TMDL Tracking System							
TMDL (Water body) Name *	**Sands Pond**						
Number of TMDLs*	1						
Type of TMDLs (Pollutant)*	Nutrients						
Number of listed causes (from 303(d) list)	4						
Any Information/prevention TMDLs ,Y/N (#?)	N						
Lead State	Rhode Island (RI)						
TMDL Status	Final						
Individual TMDLs listed below							
TMDL Segment name	TMDL Segment ID #	TMDL Pollutant ID# & name	TMDL Impairment Cause(s)	Pollutant endpoint	Unlisted?	RIPDES Point Source & ID#	Listed for anything else?
Sands Pond	RI0010046L-01	515 (Total Phosphorus)	Phosphorus, excess algal growth/chlorophyll-a, turbidity, taste and odor	22.5 ug/l phosphorus	No		No
TMDL Type	Nonpoint Source						
Cycle (list date)	2006						
Establishment Date (approval)*	June 2, 2008						
EPA Developed	No						
Towns affected*	New Shoreham (Block Island), RI						