April 29, 2002

Ms. Alicia Good
Rhode Island Department of Environmental Management
235 Promenade Street
Providence, RI 02908-5767

Dear Ms. Good:

Thank you for your final submittal of the Narrow River, Gilbert Stuart Stream, and Mumford Brook Total Maximum Daily Loads (TMDL) for fecal coliform bacteria. The U.S. Environmental Protection Agency (EPA) has determined that all three TMDL's meet the requirements of Section 303(d) of the Clean Water Act (CWA), and of EPA's implementing regulations (40 CFR Part 130). The EPA hereby approves the Narrow River, Gilbert Stuart Stream, and Mumford Brook TMDL's for fecal coliform bacteria, received by EPA on December 22, 2000. Enclosed are copies of EPA's review document.

EPA considers these TMDLs to be a first step that will enable the State to move forward with on-the-ground measures to improve water quality. We are encouraged to see that additional information will be collected in the future to evaluate the effectiveness of management actions and to determine attainment of water quality standards throughout the waterbody. EPA believes that additional information that reflects localized impacts will be necessary to make future attainment decisions.

My staff and I look forward to continued cooperation with the RIDEM in exercising our shared responsibility of implementing the requirements under Section 303(d) of the CWA. Please feel free to contact me or my staff if you have any questions or comments on our review.

Sincerely,

Linda M. Murphy, Director
Office of Ecosystem Protection

Enclosure

cc: Jan Reitsma, RIDEM
Elizabeth Scott, RIDEM
Angelo Liberti, RIDEM
Chris Turner, RIDEM

TMDL: Narrow River, RI Pathogens (Final)

	Gilbert Stuart Stream, RI	Pathogens	(Final)
	Mumford Brook, RI	Pathogens	(Final)

TMDL Authors: Kevin Bartlett (Rhode Island DEM)
Chris Turner (Rhode Island DEM)

Date: April 29, 2002

REVIEW ELEMENTS OF TMDLs

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

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

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

Comment: This document provides TMDLs for three waterbodies in the Narrow River Watershed. These include the Narrow River, Gilbert Stuart Stream, and Mumford Brook. The TMDL document identifies the waterbodies as they appear on the State's 303(d) list (page 1), the pollutant of concern (page 1 and 5), and the priority ranking (page 5).

The TMDL submittal includes a description of the point and nonpoint sources of the pollutant of concern (page 5-6 and 65-70). According to the TMDL report (page 7), it was not possible to separate natural background from the total nonpoint source load due to a lack of site specific data

on fecal coliform contributions from wildlife in the watershed.

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.

Comment: The TMDL document includes a description of the applicable water quality standards (page 6), designated uses (page 6-7), the numeric water quality criterion (page 6), and the antidegradation policy (page 7).

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 condition*s 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.

Comment: *The loading capacity in this TMDL is expressed as a concentration. As stated in* 40 *C.F.R. §130.2(i), loadings are required to be expressed as either mass-per-time, toxicity or other appropriate measure. It is appropriate to express bacteria in terms of concentration for the following reasons (page 7):*

1) Expressing bacteria in terms of concentration provides a direct link between existing water quality, the numeric target, and the water quality standard;
2) Using concentration in a bacteria TMDL is more relevant and consistent with water quality standards, which apply for a range of flow and environmental conditions; and
3) Bacteria TMDLs expressed in terms of daily loads are typically more confusing and more difficult to interpret, since they are completely dependent on flow conditions, which are often difficult to determine.
4) Followup monitoring will compare concentrations, not loads, to water quality standards.

The loading capacity for the Narrow River is set equal to the state water quality standard minus a 10% MOS for the geometric mean portion of the standard. In other words, the loading capacity (expressed in terms of concentration) is a geometric mean of 12.6/100 mL with no more than 10% of the samples exceeding 49/100 mL (page 7). The loading capacity for Gilbert Stuart Stream and Mumford Brook was set equal to the Class SA standard- geometric mean of 14/100 mL with no more 10% of the samples exceeding 49/100mL (page 7).

The link between pollutant sources and waterbody impairments/numeric targets was made via multiple surveys during wet and dry weather combined with the review of aerial photos, topographic maps, land use maps, and other GIS resources.

Supporting documentation for the TMDL analysis is provided (see page 9).

Critical conditions in the Narrow River watershed were determined to be during the summer season (Jul-Sep) and for a 72 hour period following a significant rain event.

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.

Comment: *Other than storm sewer outfalls, there are no point sources in the Narrow River watershed. The required fecal coliform reductions for Narrow River, Gilbert Stuart Stream, and Mumford Brook were calculated from observed concentrations at in-stream stations. They represent an overall reduction goal that is applicable to the composite of all sources contributing to the water quality impairment. RIDEM has identified the contamination sources to include waterfowl during both dry and wet weather, and stormwater runoff that is conveyed by tributary channels, storm sewer outfalls, and as overland flow. These sources are not currently subject to NPDES permits and therefore may all be included in the LA side of the TMDL equation.*

EPA considers these TMDL to be a first step that will enable the State to move forward with on-the-ground measures to improve water quality. Additional information will be collected to evaluate the effectiveness of management actions and to determine attainment/non-attainment of water quality standards throughout the entire waterbody. EPA believes that additional information that reflects localized impacts will be necessary to make future attainment decisions.

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.

Comment: *The State has not identified any contributing point sources subject to NPDES permit requirements. Therefore, the State has not identified any WLA's for these TMDLs.*

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.

Comment: Conservative assumptions and an explicit MOS were incorporated into the TMDL (page 11). Specifically, the target geometric mean concentration for the Narrow River was set at 10% below the fecal coliform standard. In addition, a variety of conservative assumptions were included in the calculations of receiving water concentrations for each of the three TMDL waters included in this document.

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)).

Comment: According to the TMDL report (page 11), the three TMDLs are protective of all seasons, since a large majority of the fecal coliform data used to develop the TMDL was collected during the summer months when in-stream fecal coliform concentrations are typically the highest.

8. Monitoring Plan for TMDLs Developed Under the Phased Approach

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

Comment: As stated on page 11: "Additional monitoring is required to ensure that water quality objectives are met as remedial actions are accomplished." The ongoing University of Rhode Island Watershed Watch monitoring program will be the principal method of obtaining data necessary to track water quality conditions in the watershed.

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.

Comment: An implementation plan is included in the TMDL document.

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."

Comment: Reasonable assurance is not required for approval of these TMDLs because they are for nonpoint source waters. Nevertheless, reasonable assurance in this TMDL is provided in the form of a detailed implementation plan and a commitment for continued monitoring.

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.

Comment: RIDEM has worked to fully involve the public, including the Narrow River Preservation Association (NRPA). NRPA provided valuable data, advice and support during the 1999 TMDL study and has contributed actively to the content of these TMDLs. RIDEM held an initial public meeting in March 1999 prior to TMDL development. A meeting, targeted primarily at state and local officials and local organizations, was held in December 1999 to discuss the results of that summer's monitoring program. A second public meeting, held March 16, 2000, was cosponsored with NRPA to further raise public awareness of the project and to discuss RIDEM's proposed water quality improvement measures. A third public meeting was held on October 4, 2001 to present the draft TMDLs to the public. Appendix A of this document includes questions and comments received during the 30-day comment period. Also included are RIDEM's responses to public inquires.

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.

Comment: A submittal letter with the appropriate information was included with the TMDLs.

13. Other Comments: