September 24, 2002

Harry T Stewart, P.E., Director
New Hampshire Department of Environmental Services
Water Division
6 Hazen Drive, Box 95
Concord, New Hampshire 03302-0095

SUBJECT: Notification of Approval of Williams Brook TMDL

Dear Mr. Stewart:

It is my pleasure to approve your final Total Maximum Daily Load (TMDL) report for Williams Brook in Northfield, NH. This brook was included on Tier 2 of New Hampshire's 1998 303(d) list, and the TMDL is developed for iron.

EPA has determined that the iron TMDL for Williams Brook meets the requirements of Section 303(d) of the Clean Water Act and EPA's implementing regulations (40 CFR part 130).

I want to congratulate you and the Water Division staff for the excellent work in developing this TMDL.

Sincerely,

Linda M. Murphy, Director
Office of Ecosystem Protection

Enclosure: EPA Decision Document (EPA Region 1 TMDL Review)

cc: Paul Currier, NH DES
Gregg Comstock, NH DES
Peg Foss, NH DES
Mel Cote, EPA
Carl Deloi, EPA
Alison Simcox, EPA

EPA REGION 1 TMDL REVIEW

TMDL: **Williams Brook,** Northfield, NH
(NH DES file #98; located in Merrimack River Basin)

STATUS: Final

IMPAIRMENT/POLLUTANT: Iron

BACKGROUND: On September 19, 2002, EPA Region 1 received the final Williams Brook TMDL report (dated September 2002) from the New Hampshire Department of Environmental Services (NH DES). 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 40 CFR Part 130.

REVIEWER: Alison Simcox (617-918-1684) E-mail: simcox.alison@epa.gov

REVIEW ELEMENTS OF TMDLs

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

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

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

Williams Brook was included in Tier 2 of New Hampshire's 1998 NH 303(d) list, and was classified as a high priority for potential abatement measures. The basis of this assessment was brook samples taken in 1993 and 1994 that contained iron concentrations in violation of New Hampshire's surface-water criteria for protection of aquatic life.

The brook, which has a total length of about 4.5 miles, is located in Northfield, NH, within the Merrimack River basin (watershed area upstream of Northfield stump dump of about 5.6 square miles). The TMDL focused on the lower (northern) part of the brook from the old Northfield stump dump downstream to the confluence with the Winnipesaukee River. NH DES identified this dump and some wetlands areas as potential nonpoint sources of excess iron to Williams Brook. No known point sources are present in the Williams Brook watershed.

EPA concludes that the description of waterbody, pollutant of concern, and potential pollutant sources are appropriately described.

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 TMDL submittal describes applicable water-quality standards. Williams Brook is Class B waterbody, which should be acceptable for fishing, swimming, and other recreational purposes, and, after treatment, for use as a public water supply.

The segment of Williams Brook in the final TMDL report is not currently used as drinking-water supply. Therefore, the water-quality target for this brook was based on numeric criteria for protection of aquatic life, which is 1 ppm for total iron unless natural background levels are higher. Where background concentrations exceed 1 ppm, the water-quality goal is not to exceed naturally occurring concentrations.

NH DES determined that natural background concentrations in the vicinity of Williams Brook do exceed 1 ppm. Therefore, the applicable numeric criteria for iron for this TMDL are natural background iron concentrations.

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.

Instead of using a mass load to express the loading capacity, NHDES used a concentration approach. Using this approach, the in-stream iron concentrations downstream of the stump dump were compared to concentrations upstream of the dump (i.e., natural background conditions) to determine if significant differences existed.

Analysis revealed that, for this brook, flow is inversely proportional to iron concentrations, so that the highest concentrations of iron the brook are regularly associated with the low-flow, summer season. Therefore, the critical period for this TMDL typically occurs in the summer months (which, as mentioned under TMDL Element #7 below, includes the period for which the TMDL is established).

EPA concurs with NH DES that the analytical approach used to link water quality in Williams Brook with pollutant (iron) sources was reasonable, and enabled NH DES to reasonably conclude that natural background conditions contribute significant amounts of iron to the brook, amounts that likely exceed those contributed by the former stump dump. In addition, this analysis showed that, for the monitoring period from 1992 to 2000, the range of total iron concentrations downstream of the dump is in the same general range as iron concentrations upstream of the dump.

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.

The TMDL document sets the load allocation equal to natural background iron concentrations. When this goal is met, the loading of iron from the stump dump will be negligible and water quality standards are expected to be achieved.

EPA concurs with NH DES that the load allocation has been appropriately set.

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.

The Williams Brook watershed does not contain any known point sources, and therefore, the WLA is set at zero. EPA concludes that the WLA component of the TMDL is appropriately set based on the state's determination that there are no point sources in the watershed.

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.

In this TMDL, water-quality criteria are set at background concentrations of iron, and the TMDL is set equal to these background levels. Under these circumstances, a Margin of Safety is not applicable as it is not possible to define an MOS for background conditions.

In addition, there is a high level of certainty that sufficient remedial action has been taken (i.e., capping of landfill) to achieve required reductions in loading and attainment of water quality goals.

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)).

As mentioned under TMDL Element #3, the analytical approach used to related water quality in Williams Brook to pollutant sources revealed that flow is inversely proportional to concentration of the pollutant, iron. In particular, the highest concentrations of iron the brook are regularly associated with the low-flow, summer season. Therefore, the critical period for this TMDL typically occurs in the summer months.

The TMDL sets the concentrations equal to the natural background concentrations during all seasons. EPA, therefore, concludes that seasonal variations were adequately taken into account in establishing this TMDL.

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.

The town of Northfield monitored the surface water in Williams Brook at locations upstream and downstream of the stump dump biannually from 1992 to 2000. These data indicate that, under

most flow conditions, the trend in iron in the brook has generally been declining since the landfill was capped. NH DES states in the TMDL report that, if resources allow, they may be available to assist the town with future monitoring.

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 TMDL document states that a two-foot thick earthen cover was installed in 1993 over the stump dump, thus reducing the amount of water infiltrating into and through the landfill. Monitoring data provided by NH DES indicate that this cover appears to be effective. Specifically, when flow is taken into account, the difference between upstream and downstream iron concentrations from 1995 to 1998 have generally shown a declining trend.

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 State of New Hampshire installed an earthen cover on the Northfield stump dump in 1993. EPA concurs that, through this action, the appropriate BMP to reduce the impact of the stump dump on Williams Brook has been implemented.

Reasonable assurances are provided by the permanence of the landfill cover, and by monitoring data from 1992 to 2000 that generally show a downward trend in differences between iron concentrations upstream and downstream of the former dump.

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.

NH DES made a draft of this TMDL available for public comment on August 27, 2002. Comments were accepted through September 17, 2002. No comments were received during this period. EPA concludes that NH DES met their requirements for public participation for this TMDL.

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.

A submittal letter was included in the final TMDL for Williams Brook, which was received by EPA on September 24, 2002.