EXHIBIT B

LONG ISLAND SOUND STUDY

A Partnership to Restore and Protect the Sound

The Long Island Sound Office
of the U.S. Environmental Protection Agency

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APR 0 3 2001

Arthur J. Rocque, Jr.
Commissioner
Connecticut Department of Environmental Protection
79 Elm Street
Hartford, CT 06106-5127

Erin Crotty
Commissioner
New York State Department of Environmental Conservation
50 Wolf Road
Albany, NY 12233-3508

Dear Mr. Rocque and Ms.Crotty:

In 1990, the states of New York and Connecticut took a major step toward addressing hypoxia in Long Island Sound by adopting a no-net increase policy for nitrogen loads. In the decade since that step, a sustained commitment to address the problem has resulted in other significant milestones. None was more important than the 1998 agreement to reduce the amount of nitrogen from the Connecticut and New York portions of the Long Island Sound watershed by 58.5 percent, and to implement that agreement through the development of a Total Maximum Daily Load (TMDL) in conformance with Section 303(d) of the Clean Water Act. Your leadership was fundamental to that agreement and to the preparation of the TMDL--*A Total Maximum Daily Load Analysis to Achieve Water Quality Standards for Dissolved Oxygen in Long Island Sound.*

Connecticut's complete TMDL package, dated December 28, 2000, was received by EPA on January 8, 2001. New York submitted the TMDL to EPA on January 8, 2001 and the public responsiveness document on February 1, 2001. As documented in the enclosed review, the final submittal includes all of the required elements of a TMDL and is designed to ensure the attainment of water quality standards for dissolved oxygen in the Long Island Sound. The U.S. Environmental Protection Agency has determined that the TMDL meets the requirements of §303(d) of the Clean Water Act, and EPA's implementing regulations (40 CFR Part 130) and hereby approves Connecticut's and New York's final TMDL for dissolved oxygen in the Long Island Sound.

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We recognize the challenge posed by integrating an adaptive ecosystem management approach with the core elements of the TMDL program. We believe the TMDL is a model for how this can be accomplished -- and a challenge to EPA, Connecticut, and New York to work together to ensure that the commitments and schedules within the TMDL are implemented. We want to thank you and your staffs for your willingness to work with EPA during its development.

Sincerely,

Ira W. Leighton
Acting Regional Administrator
EPA-New England

William J. Muszynski, P.E.
Acting Regional Administrator
EPA Region 2

Enclosure

EPA NEW ENGLAND AND EPA REGION 2 TMDL REVIEW

TMDL: Long Island Sound, Connecticut and New York

STATUS: Final

IMPAIRMENT/POLLUTANT: Hypoxia (low dissolved oxygen) due to excess nitrogen

BACKGROUND: CTDEP and NYSDEC released the draft TMDL for public comment in November 1999. EPA provided comments in a letter dated April 6, 2000. CTDEP and NYSDEC submitted the final TMDL in letters signed by CTDEP on December 28, 2000 and NYSDEC on January 8, 2001.

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.

A. Description of Waterbody

The TMDL contains an adequate description of Long Island Sound and its watershed. Long Island Sound covers about 1,300 square miles, measuring 100 miles from east to west and about 21 miles wide at its widest point between New Haven, Connecticut and Port Jefferson, New York. Mid-Sound depths range from 60 to 120 feet. Long Island Sound is an estuary, where salt water from the ocean mixes with fresh water from rivers and runoff from the land. Like other estuaries, the Sound provides feeding, breeding, nesting, and nursery areas for diverse animal and plant life. But Long Island Sound is unique in other ways. Unlike most other estuaries, the Sound does not have one connection with the sea – it has two. Rather than having a major

source of fresh water at its head, flowing into a bay that empties into the ocean, Long Island Sound is open at both ends. Lower salinity waters enter the western Sound from New York Harbor through two tidal straits, the East River and Harlem River, and higher salinity waters enter at its eastern end through Block Island Sound and The Race. Most of its fresh water comes from several south-flowing rivers, including the Connecticut, the Housatonic, and the Thames, whose drainages reach as far north as Canada. The largest source of fresh water is the Connecticut River, which enters the Sound at its eastern end and contributes approximately 70 percent of the more than six trillion gallons of fresh water that enters the Sound each year. The Long Island Sound drainage area is approximately 16,000 square miles in size and includes most of the land area of Connecticut, and portions of New York (including New York City), Massachusetts, Vermont, New Hampshire, and the Canadian province of Quebec. The Sound lies within the most densely populated region in the United States. More than eight million people live in the Long Island Sound watershed, and millions more travel there each year to take advantage of the many recreational and economic opportunities it provides.

Long Island Sound combines this multi-inflow/outflow system with a highly convoluted shoreline and a complex bottom topography. Taken together, they produce unique and complex patterns of tides and currents. EPA recognizes that these physical characteristics, combined with the impacts of human population growth and urban development, make managing the Sound's water quality a highly complex task.

B. Pollutant of Concern

The TMDL clearly establishes nitrogen as the principal pollutant that is preventing the attainment of the states' water quality standards for dissolved oxygen in Long Island Sound. This determination is based on the findings of the 15-year Long Island Sound Study (LISS), part of EPA's National Estuary Program, which included extensive ambient water quality monitoring, water circulation studies, research into the effects of low dissolved oxygen on marine organisms, and monitoring of sewage treatment plant effluents, CSOs, atmospheric deposition, and nonpoint sources. The results of this intensive monitoring and research program were used to help develop water quality and hydrodynamic models, which in turn were coupled to create a time variable, three-dimensional, hydrodynamic/water quality model, called LIS 3.0. The LIS 3.0 model was used to measure the relative impact of nutrients and organic carbon on dissolved oxygen (DO) conditions in the Sound. While organic carbon loadings play a role, the studies show that nitrogen is the principal pollutant of concern for meeting DO standards in Long Island Sound.

C. Pollutant Sources

The TMDL provides a detailed description of the many sources of nitrogen, including their relative magnitude and location, that affect dissolved oxygen levels in Long Island Sound. Of the approximately 100,436 tons of nitrogen that are estimated to be delivered to the Sound each year, about one-third enters through the two ocean boundaries at The Race to the east and the

East River to the west. The TMDL presents the current contributions of nitrogen as being about 42 percent of the load from point sources, including sanitary and industrial wastewater discharges within the Long Island Sound drainage basin, and about 13 percent from nonpoint sources, including runoff from urban and agricultural land and septic systems. The remaining 12 percent of the load is from atmospheric deposition, including nitrogen deposited directly on the Sound and nitrogen delivered to the Sound from deposition on the drainage basin.

The TMDL has distinguished between point and nonpoint sources of nitrogen, to the extent practicable, considering the geographic scale of the Long Island Sound watershed and the land use-based approach used to estimate nonpoint source loadings. EPA recognizes that currently it is not feasible to distinguish between the stormwater loadings from point source stormwater discharges and CSOs in Connecticut, on the one hand, and nonpoint source runoff on the other hand, because of the overlap that exists between these two source categories and the lack of stormwater and CSO monitoring data. For example, the TMDL used nonpoint source load estimates derived from runoff coefficients applied to specific land uses. This methodology provides an overall nonpoint source load estimate that includes nitrogen delivered through point source stormwater discharges, overland runoff, and groundwater flows. Additional monitoring and modeling would be necessary to identify the portion of the total nonpoint source load estimate that is delivered through the point source stormwater discharges versus other delivery routes. Therefore, EPA agrees that it is reasonable, in this case, to include all such stormwater related loadings in the nonpoint source category.

D. Priority Ranking

The TMDL was developed in response to the high priority placed on this waterbody by Connecticut, New York, and EPA. Since 1992, Long Island Sound has been identified by both states on their biennial lists of impaired waters, developed and submitted to EPA pursuant to section 303(d) of the Clean Water Act. Both states identified the Sound on their 1998 303(d) list as a priority for TMDL development by April 1, 2000. The purpose of this TMDL is to establish the legal foundation on which the states will base nitrogen load reductions, and other management strategies, necessary to meet the states' water quality standards for dissolved oxygen. The TMDL document provides a detailed description of the link between nitrogen loads and low dissolved oxygen, or hypoxia, the extensive monitoring and modeling program on which this determination was based, and the rationale for targeting nitrogen as the pollutant of concern.

In summary, EPA finds that the TMDL meets the requirements for describing the waterbody, pollutant of concern, pollutant sources, 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

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.

A. Applicable WQS and Designated Use(s)

The TMDL adequately describes the applicable water quality standards for Long Island Sound, including a description of the designated uses, and numeric water quality criteria for dissolved oxygen (DO). Specifically, the TMDL includes the relevant standards in both New York state's water quality standards identified in NYSCRR, title 6, Chapter X, Parts 701 and 703, and Connecticut's *Water Quality Standards*[i]. The applicable designated uses for each marine classification are presented, including general spatial and areal descriptions for each surface water classification, in TMDL Sections III.B and III.C).

B. Numeric Criteria

As discussed in the TMDL, hypoxia (low dissolved oxygen) is linked to an overabundance of nitrogen combined with the natural occurrence of density stratification of the water column in Long Island Sound (Sections I.B and III.A). Nitrogen has been established as the limiting nutrient for algal growth in Long Island Sound and has been identified as the primary factor leading to low DO levels and subsequent loss of designated uses. In the absence of criteria for nitrogen in estuarine environments, and given the established relationship between excessive nitrogen and its ultimate effects on dissolved oxygen, the TMDL for nitrogen is translated from DO criteria.

EPA agrees with this approach given the demonstrated effect that excessive nitrogen has on algal growth and its relationship to dissolved oxygen in aquatic environments[ii]. Also, EPA agrees with applying DO criteria since a well-calibrated model and ambient water quality data demonstrate that depletions of dissolved oxygen in Long Island Sound are the result of excessive loadings of nitrogen[iii].

The TMDL references EPA's new *Ambient Water Quality Criteria for Dissolved Oxygen (Saltwater): Cape Cod to Cape Hatteras (November 2000)* and states that the saltwater oxygen criteria presented in this document, and any revisions to state water quality standards based on these new criteria, will be evaluated during the planned five-year review periods, and in any future revision(s) to the TMDL. However, as noted in TMDL Section VII.F, the EPA saltwater DO criteria and any subsequent revisions to New York and Connecticut water quality standards for saltwater DO criteria will not affect the necessity of the Phase III nitrogen reduction targets for in-basin sources. Based on modeling analyses performed to date, it will still be necessary to meet, at minimum, the Phase III (in-basin) nitrogen reduction targets to attain water quality standards for DO derived from EPA's new saltwater DO criteria. Thus, it is clear that future

revisions to the TMDL based upon the saltwater DO criteria would not affect the need to achieve Phase III nitrogen reductions targets (also see Section 3 - Loading Capacity).

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.

A. Loading Capacity

TMDL Section VI.G identifies a nitrogen loading capacity (LC) of 72,239 tons per year. A summary of the component allocations comprising the LC is provided in Table 1. This nitrogen LC is based on concomitant carbon reductions achieved as a consequence of the nitrogen control program. The LIS 3.0 model provides a sound basis for concluding that Long Island Sound will achieve water quality standards for DO during critical conditions if nitrogen loading is limited to 72,239 tons of nitrogen per year and the loading capacity of Long Island Sound to assimilate nitrogen is added through non-treatment alternatives, such as adding oxygen to certain segments of the Sound.

Table 1. Long Island Sound Nitrogen Loading Capacity (tons/year)

	In-Basin	Out-of-Basin	Total
WLA	15,556	2,243	17,799
LA	8,410	46,030	54,440
Total	23,966	48,273	72,239

As discussed in Section V.C.2 of the TMDL, the LIS 3.0 model predicted that after executing Phase III and Phase IV reductions, approximately 125 model segments would still not meet water quality standards for DO criteria. The TMDL recommends the use of non-treatment alternatives (Phase V) to attain water quality standards. One of the alternatives identified is mixing/aeration. Based on an analysis of this alternative, it was estimated that the addition of at least 10,000 lbs/day of oxygen to each of the 125 model segments, combined with the nitrogen and associated carbon reductions identified in Phase III and Phase IV of the TMDL, could attain DO standards. A couple of the other alternatives, such as seaweed farms and tide gates, may also function to increase loading capacity, but the details of these options are not sufficiently developed to allow for a specific increase to be identified.

Table 8 of the TMDL illustrates the overall effect of each phase on DO concentrations, and the ultimate achievement of water quality standards for DO concentrations. EPA agrees that the nitrogen LC identified for each phase, in particular Phase III and Phase IV, in combination with Phase V non-treatment alternatives (e.g., mixing/aeration), will ultimately achieve water quality standards for the Long Island Sound. Also, as written in TMDL Section VII, EPA especially recognizes CTDEP's and NYDEC's commitment to evaluate and implement Phase V non-treatment alternatives to attain water quality standards.

Although loadings are typically expressed as daily loads, a daily measure is not necessarily appropriate for all waterbodies, all impairments, or all pollutants. EPA regulations require only that a TMDL be "expressed in terms of mass per time, toxicity, or other appropriate measure" {40CFR §130.2(I)}. For the purposes of this TMDL, maximum annual loadings were established. As explained in the TMDL Sections V.C and VI.F, nitrogen loadings occur throughout the year, contributing to the total pool of nitrogen available for phytoplankton uptake. Hypoxia, resulting from the decay of the organic matter produced by the phytoplankton, is not sensitive to daily or short term nitrogen loadings; rather, it is a function of annual loading. Therefore, EPA agrees with expressing the TMDL as an allowable annual load of nitrogen (tons per year) given the demonstration, based on the LIS 3.0 model, that DO levels are a function of the total pool of available nitrogen and annual nitrogen loadings.

B. Cause-and-Effect Relationship between Numeric Target and Pollutant

As described in TMDL Section V.C, the LIS 3.0 model was developed to examine the dynamics of dissolved oxygen in the Long Island Sound, and to evaluate the range of options for improving conditions. This model is a three-dimensional, time variable hydrodynamic/water quality model that incorporates physical, chemical, and biological processes relating nutrients and carbon-based pollutants to phytoplankton dynamics and DO. The LIS 3.0 model was used to simulate the DO levels in Long Island Sound under varied nutrient loadings. Based on LIS 3.0 modeling results and data analyses, nitrogen was determined to be the primary limiting nutrient.

EPA concludes that the application of the LIS 3.0 model adequately establishes the cause-and-effect relationship between DO and nitrogen. EPA agrees that the model is well calibrated because of the established agreement between the observed data with the modeled results. Further, as described in Section V, EPA agrees with the conclusion that this model was properly calibrated and thus represents the relationship between nitrogen loading and its effect upon DO concentrations in the Long Island Sound.

As previously discussed, the principal pollutant of concern in this TMDL is nitrogen. However, organic carbon also contributes to oxygen depletion. While organic carbon is not specifically targeted for reduction, nitrogen reduction technologies for both point and nonpoint sources will also reduce carbon loadings to the Long Island Sound. The LIS 3.0 model was used in the TMDL analysis to predict improvements in dissolved oxygen resulting from both nitrogen and organic carbon reductions. The TMDL does not include allocations based on organic carbon; however, the predicted improvements in dissolved oxygen are based on both organic carbon and nitrogen reductions.

Finally, the LIS 3.0 model was subjected to extensive peer input and comment. In fact, an independent Model Evaluation Group, composed of national water quality modeling experts, was established to provide constructive input and recommendations during the development and application of this water quality model. The Model Evaluation Group offered approval of this model in November 1994[iv].

C. Critical Condition(s)

Environmental and ecological processes that ultimately lead to critical hypoxic conditions in the Long Island Sound are adequately described on pages 1 and 2 in the TMDL document. Additionally, based on ambient water quality monitoring surveys, the period between 1988 and 1989 was identified as the most severe period of recorded hypoxic conditions in the Sound. The data generated during this critical period was used to calibrate the LIS 3.0 model. Model simulations were run with reduced nitrogen loads to project water quality conditions resulting during the same physical conditions that existed during the 1988-1989 period.

Based on EPA's review of the LIS 3.0 model, in particular TMDL Section V.C, which included a discussion of the model's calibration under the severe hypoxic period, we conclude that calibration was adequate given the agreement between the observed data with the modeled results. Also, EPA agrees that the application of the 1988-1989 data for model calibration, and its application to calculate levels of nitrogen reduction during this critical period, is appropriate because it represents a more conservative approach for estimating levels of nitrogen reductions to meet water quality standards as compared to modeled results based on average conditions. EPA concludes that the critical condition is appropriately described and applied in the LIS 3.0 model, and, subsequently, in development of the TMDL.

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, summarized in Section VI.G, includes in-basin nitrogen reductions and out-of-basin nitrogen reductions for point and nonpoint sources. The existing nonpoint source loads are described in the TMDL Section V.B and include pre-colonial (i.e., natural background), terrestrial, and atmospheric loads.

The TMDL includes the following load allocations: a LA (based on Phase III nitrogen targets) of 8,410 tons/yr of nitrogen for in-basin nitrogen sources and a LA (based on Phase IV nitrogen targets) of 46,030 tons/yr of nitrogen for out-of-basin nitrogen sources and atmospheric loads (in-basin and out-of-basin). The total LA is 54,440 tons/yr.

A. Phase III Nonpoint Source Reductions

The Phase III nitrogen targets are based on an overall 58.5 percent reduction, which has been applied to the cumulative point and nonpoint source nitrogen loads from urban and agricultural land uses within each of the 11 management zones. The process for deriving the 58.5 percent reduction target is described in Section V.C.2.

Table 6 of the TMDL submittal identifies the wasteload and load allocations within each of the 11 management zones. The load allocations are based on achieving a 10 percent reduction in the total nonpoint source loads from urban and agricultural land uses. Appendix A of the TMDL document provides the supporting information on the calculation of the existing nonpoint sources loads and the 10 percent reduction target used to derive the LA.

B. Phase IV Nonpoint Source Reductions

The TMDL identifies load allocations for out-of-basin nitrogen loads (i.e., tributary loads) that would be achieved through the implementation of Phase IV reduction targets. For nonpoint sources, the Phase IV targets include a 10 percent reduction in urban and agricultural loads throughout the Long Island Sound basin north of Connecticut, and an 18 percent reduction in atmospheric nitrogen loads. These reductions are based on the clear role that these nonpoint sources have on water quality in Long Island Sound.

Some public comments on the draft TMDL questioned whether states have the authority to assign allocations to sources in other states. In this case, EPA is not approving the out-of-basin nitrogen reductions as formal allocations but rather as reasonable assumptions on which the in-basin reductions are based. EPA believes that states have some flexibility to make assumptions about improvements in water quality beyond their jurisdictions. If they base a TMDL on such assumptions, states must clearly explain why the assumptions are reasonable. In this case, the states' estimated 10 percent reduction in urban and agricultural nonpoint source loads is reasonable for the same reasons that were identified for the 10 percent reduction to the in-basin urban and agricultural loads. These reasons are detailed in the Reasonable Assurances section of this review. The estimated 18 percent reduction in atmospheric nitrogen loads is reasonable because it was taken from EPA estimates of the effect of implementation of CAA controls and its enforceable requirements, similar to the in-basin reductions of atmospheric nitrogen loads. EPA believes that these estimates of future reductions make sense. Moreover, as discussed in the Reasonable Assurance section below, EPA is committed to working with the three northern states to address nitrogen loads affecting Long Island Sound through their nonpoint source management programs.

C. Phase V Nonpoint Source Reductions

Additionally, the TMDL document identifies Phase V non-treatment alternatives which are necessary to achieve the water quality standard for DO. As described under the WLA section, point sources will be required to implement advanced treatment for nitrogen removal. However, even with advanced treatment and aggressive nonpoint source reduction plans, water quality standards may not be fully achieved during the summer in the bottom waters of the Long Island Sound. Therefore, the TMDL identifies non-treatment alternatives as actions to attain water quality standards. Some of these alternatives, such as artificial wetlands and seaweed farms, may function to further reduce nonpoint source loads. Others, such as oxygen injection discussed above, could add loading capacity. Use of non-treatment alternatives to achieve water quality standards is permitted under 40 CFR 125.3(f). The TMDL includes a schedule for evaluating and implementing the non-treatment alternatives (Section VII, Table 13). The evaluation of these alternatives is scheduled to begin in January 2001.

EPA concludes that the TMDL has identified load allocations for background and nonpoint sources of nitrogen. The allocations and assumptions for nonpoint sources are reasonable and can be achieved through an aggressive nonpoint source program. The TMDL provides for evaluation and reassessment of the control actions needed to achieve water quality standards.

5. Wasteload Allocations (WLAs)

EPA regulations require that a TMDL include WLAs, which identify the portion of the loading capacity allocated to existing and future point sources (40 C.F.R. § 130.2(h)). If no point sources are present or if the TMDL recommends a zero WLA for point sources, the WLA must be expressed as zero. If the TMDL recommends a zero WLA after considering all pollutant sources, there must be a discussion of the reasoning behind this decision, since

a zero WLA implies an allocation only to nonpoint sources and background will result in attainment of the applicable water quality standard, and all point sources will be removed.

In preparing the wasteload allocations, it is not necessary that each individual point source be assigned a portion of the allocation of pollutant loading capacity. When the source is a minor discharger of the pollutant of concern or if the source is contained within an aggregated general permit, an aggregated WLA can be assigned to the group of facilities. But it is necessary to allocate the loading capacity among individual point sources as necessary to meet the water quality standard.

The TMDL submittal should also discuss whether a point source is given a less stringent wasteload allocation based on an assumption that nonpoint source load reductions will occur. In such cases, the State/Tribe will need to demonstrate reasonable assurance that the nonpoint source reductions will occur within a reasonable time.

A. Phase III Point Source Reductions

The TMDL identifies the sum of the WLAs for each of the 11 management zones in Table 6 of the TMDL document. The draft TMDL document (October 1999) made available for public comment did not provide the individual facility WLAs. The final TMDL now identifies the facility-specific WLAs for sources in the Connecticut and New York portions of the watershed in Appendix C. The WLAs are based on advanced treatment for nitrogen removal. The process for selecting the appropriate level of treatment for point sources is described in Section V.C.2.

The draft TMDL also characterized CSOs and stormwater outfalls as nonpoint sources and assigned load allocations to them. EPA commented that CSOs and certain stormwater discharges are point sources for which WLAs must be established. Under the TMDL regulations, wasteload allocations are required to be developed for point sources subject to the NPDES permit program. Discharges that are not subject to the NPDES permit program, such as certain stormwater discharges, are not clearly required to be assigned wasteload allocations. Consequently, a state may in its discretion assign either WLAs or LAs to such discharges.

The final TMDL addresses these issues in Section V.B.4. As discussed above, it is not currently feasible to separate point source stormwater discharges from nonpoint source runoff for an area of this geographic scope, where estimates are necessarily based on land use and runoff coefficients, and because of the lack of stormwater monitoring data. Therefore, EPA agrees that it is reasonable, in this case, to include stormwater in the nonpoint source loadings, and to assign load allocations rather than wasteload allocations. As noted in the TMDL, development of the NPDES Stormwater Phase II permitting program will provide opportunities to determine the load from stormwater sources and identify appropriate wasteload allocations.

The final TMDL categorizes New York City CSO loads as point sources. The final TMDL still does not specifically identify point source loads from CSOs in Connecticut. Rather, the aggregate loads from all Connecticut CSOs continue to be split between the point and nonpoint categories, as explained in the more detailed rationale in Section V.B.4. In essence, the stormwater related loads that would be discharged through the Connecticut CSO outfalls are included in the overall estimates of nonpoint source (stormwater) loads for each zone. The non-

stormwater related pollutants (i.e. the sanitary waste normally treated at the POTWs) that would be discharged during CSO events are reflected in the loads presented for the various Connecticut POTW point sources. The reductions in the stormwater component of the CSO discharges that will result from nonpoint source controls in the CSO drainage area are reflected in the zone by zone load allocations of the TMDL. Connecticut has taken this approach because there are limited monitoring and modeling data for the Connecticut CSOs. In the absence of such data, the State is unable to meaningfully separate the CSO loads from the existing point and nonpoint source load estimates. EPA is approving the TMDL as being reasonable under the circumstances, given the lack of data and the difficulty in estimating what portion of the stormwater related loads would be discharged through the CSOs rather than through other stormwater pipes and via runoff. Significant to EPA's approval is the TMDL's recognition that this approach to CSOs is temporary. As described in Section V.B.4, the State is committed to developing municipal CSO control programs. These programs will provide opportunities to identify the actual CSO loads and appropriate wasteload allocations. As appropriate wasteload allocations are identified for CSOs, the TMDL must be revised to reflect these wasteload allocations.

The TMDL provides for the opportunity to implement trading programs (Section VI.A.1). EPA's April 6, 2000 letter commenting on the draft TMDL provided guidance to the States on revising TMDLs/WLAs/LAs through trading. The final TMDL document reflects EPA's policy on trading. With regard to revisions in WLAs, EPA would not require that a new TMDL be established to reflect the revised WLAs as long as the new allocations resulted in equal or greater water quality improvements, as defined by the use of the equivalency factors identified in the Table 7 of the TMDL. The equivalency factors comprise river delivery factors (the amount of nitrogen discharged to a river segment that makes it the mouth of the river) and Long Island Sound transport efficiencies (the relative impact of nitrogen discharged from a management zone on the hypoxic hotspots). EPA must be notified annually of any changes in the WLAs through reallocations or trading. The following conditions determine whether allocations could be revised without resubmitting the TMDL for review and approval:

- Within a management zone and tier, reallocations among facility-specific WLAs can be modified without resubmitting a revised TMDL.

- Among management zones and tiers, reallocations among facility-specific WLAs can be modified without resubmitting a revised TMDL as long as the new allocations resulted in equal or greater water quality improvements, as defined by the use of the exchange ratios identified in Table 6 of the TMDL document.

- Any reallocations of LAs among management zones or tiers, or reallocations between WLAs and LAs within and among management zones and tiers, must be reflected in a revised TMDL to ensure that there is a reasonable assurance that the modified LAs could be achieved.

- A revised WLA shall not be established if it causes localized adverse water quality impacts.

The final TMDL document also addresses EPA's comments regarding future growth. While the draft TMDL did not discuss future growth, TMDL Section VI.A.1 indicates that the Phase II reduction targets represent a cap on nitrogen discharges. Any increased loads due to population growth and development would need to be offset by additional load reductions, most likely through increased treatment. However, the TMDL also notes that only modest population growth is anticipated.

B. Phase IV Point Source Reductions

The TMDL identifies wasteload allocations for out-of-basin nitrogen loads (i.e., tributary loads) that would be achieved through the implementation of Phase IV reduction targets. Specifically, the Phase IV targets include a 25 percent reduction in point source nitrogen loads, based on the clear role that these sources have on water quality in Long Island Sound.

As discussed above, EPA is not approving the out-of-basin nitrogen reductions as formal allocations but rather as reasonable assumptions on which the in-basin reductions are based. In this case, the states' estimated 25 percent reduction in nitrogen loads from point sources (primarily POTWs) is reasonable because this level of reduction has been demonstrated as feasible through Biological Nutrient Removal (BNR) retrofits of existing facilities. These low cost retrofits were implemented at numerous Connecticut POTWs during Phase II of the Long Island Sound nitrogen reduction program. The reductions achieved by these retrofits support the predicted 25 percent reduction by out-of-basin sources. EPA believes that these estimates of future reductions make sense. Moreover, as discussed in the Reasonable Assurance section below, EPA is prepared to use its authorities when issuing NPDES permits to dischargers in Massachusetts and New Hampshire, and in overseeing permit issuance in Vermont, to translate the nitrogen reductions into facility specific requirements in order to achieve the overall 25 percent reduction level. EPA has already begun to include nitrogen monitoring requirements in Massachusetts permits.

C. Phase V Point Source Reductions

One of the non-treatment alternatives discussed in Phase V is outfall relocation from the East River to the Atlantic Ocean. If implemented, this would result in revised wasteload allocations for the current East River outfalls and reductions in point source loadings to the Sound.

In summary, the TMDL establishes WLAs and LAs for nitrogen, the primary pollutant of concern. As previously described under Section 3.B of this document, nitrogen removal technologies will also result in a reduction in organic carbon, a pollutant which also depletes oxygen. Thus, although the TMDL does not include LAs and WLAs for organic carbon, organic

carbon reductions are reflected in the predicted improvements that are expected to result in meeting the dissolved oxygen standard. In addition to WLAs and LAs for nitrogen (and the concomitant organic carbon reductions), the TMDL relies upon assumptions for improvement in water quality from out-of-basin sources, and on the implementation of one or more non-treatment alternatives in order to meet the water quality standards for dissolved oxygen.

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 TMDL document describes the margin of safety in Section VI. D. The TMDL utilizes an implicit MOS through the use of conservative assumptions, which include the use of the 1988-1989 worst case scenario as the base condition and safety factors in the calculation of aeration levels.

The base condition of 1988-89 represents the most severe hypoxia period observed from 1986 to 2000 by the ambient monitoring program. By establishing the loading capacity and load reductions necessary to attain water quality standards during conditions similar to this critical period, the TMDL provides a margin of safety in meeting water quality standards during years with more typical water quality conditions.

Second, in the event that mixing/aeration is relied upon to increase loading capacity, an additional margin of safety exists with respect to the recommended levels of oxygen introduced into the Sound. The TMDL document indicates that safety factors were used in calculating the amount of aeration to bottom segments needed to meet the DO standard. The memo referenced in the TMDL identifies a preliminary estimate derived from work performed during the development of the Harbor Eutrophication Model of 8,000 lbs/day of oxygen within each of the predicted 125 model segments that do not attain DO standards at the TMDL's LC to disrupt stratification in the water column. The 10,000 lbs/day aeration per model segment used in the TMDL represents an additional 2,000 lbs/day of aeration to account for uncertainty and provide a margin of safety.

EPA concludes that the TMDL incorporates an adequate margin of safety.

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)).

Seasonal variation is described in Section VI. E of the TMDL document. The LIS 3.0 model was calibrated over an 18-month period, thereby covering all seasons of the year. Seasonal variations attributed to dry- and wet-weather conditions were considered by the model. Hypoxia conditions in the Long Island Sound typically occur during the summer from June through September. As previously described, the TMDL uses the minimum hourly DO concentrations simulated by the model during the summer hypoxic conditions to assess the reductions necessary to meet water quality standards. This analysis therefore accounts for seasonal variations and critical conditions to ensure that water quality standards are achieved 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), 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.

Section V.A of the TMDL provides details of ambient monitoring efforts, and illustrates the intensive monitoring efforts that continue in Long Island Sound. Data collected include temperature, salinity, DO, chlorophyll, nutrients and other chemical analyses, conductivity and depth profiles. The ambient monitoring program provides substantial temporal and spatial coverage adequate to assess the response in water quality to nitrogen load reduction.

In addition to ambient water quality, substantial efforts are underway to monitor and model nutrient loads from point, nonpoint, and atmospheric deposition. TMDL Section VI.A.2 briefly describes the Connecticut and New York plans to monitor nonpoint sources. Connecticut plans to monitor nonpoint source implementation activities to ensure that nonpoint source management progress is meeting the TMDL requirements. New York will monitor the application of BMPs and use existing monitoring networks to ensure that the TMDL nonpoint source nitrogen reductions are achieved. The water quality model recently developed by the CTDEP using funds provided by EPA New England will provide a tool to assess the effect of best management practices and watershed restoration programs on nutrient loading. The cooperative watershed monitoring program conducted by USGS will provide continued trend data on tributary loads. In addition, EPA New England's work with USGS to develop the SPARROW model should provide additional benefits to estimating the effect of source controls on out-of-basin sources. Monitoring of point sources will be provided in the requirements of NPDES permits to help assess the efficiency of nitrogen removal efforts.

Based on existing and future monitoring efforts by LISS, CTDEP, NYCDEP, the Interstate Environmental Commission, citizen volunteer monitoring programs, and projected NPDES

monitoring requirements, EPA concludes that adequate data will be collected to validate whether or not the load reductions required by the TMDL are achieved and whether they result in attainment of water quality standards in Long Island Sound.

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.

Although an implementation plan is not a requirement for approving a TMDL, the TMDL identifies implementation actions and scheduling frameworks for each phase of the TMDL. Details for implementation are found in Section VII of the TMDL, including a "schedule of commitments" to attain water quality standards. Briefly, the commitments include 1) achieve Phase III nitrogen reduction target for in-basin sources, 2) establish and implement Phase IV actions for out-of-basin sources, 3) evaluate and implement Phase V non-treatment alternatives, as necessary, to attain water quality standards; and 4) refine management actions, as appropriate, based on new information. EPA recognizes, and supports the commitment for the implementation of each phase to ultimately achieve water quality standards (also see Section 3, Loading Capacity). EPA will transmit more detailed comments on specific aspects of the implementation of each phase under separate cover.

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 TMDL targets the largest share of nitrogen reductions to sewage treatment plants. Biological Nutrient Removal (BNR) projects implemented to date demonstrate that the overall level of nitrogen reduction allocated to sewage treatment plants can be attained. Reasonable

assurance that nitrogen reductions from sewage treatment plants will occur is offered through the NPDES requirements for those treatment facilities identified in Appendix C of the TMDL. The NPDES permits issued to each of the treatment facilities are legally enforceable, thus offering reasonable assurance that controls will be implemented. There is also reasonable assurance that sources regulated under the NPDES Phase II Stormwater and Concentrated Animal Feeding Operation (CAFO) permitting programs will be addressed.

The load allocations are based upon achieving a 10 percent reduction in the total nonpoint source load from urban and agricultural land covers, which assumes the application of best management practices with an average nitrogen removal efficiency of 20 percent on 50 percent of the urban and agricultural land. It is reasonable to expect that this level of reduction can be attained through an aggressive nonpoint source control program that includes regulatory, nonregulatory, and incentive-based components. TMDL Section VI.A.2. describes how reasonable assurance is provided for meeting the in-basin load allocation. The primary basis for the reasonable assurance that the in-basin load allocation will be achieved is the inclusion of nitrogen reduction strategies in the states' Nonpoint Source Management Programs, developed under section 319 of the Clean Water Act, and their Coastal Nonpoint Pollution Control Programs, developed pursuant to section 6217 of the Coastal Zone Act Reauthorization Amendments (CZARA) of 1990. Both states' Nonpoint Source Management Programs underwent substantial upgrades during 1999-2000, which were subsequently approved by EPA, and now include specific, quantifiable goals for reducing nitrogen and other pollutant loads from different nonpoint source categories (e.g., urban, agriculture, hydromodification) as well as detailed descriptions of how these goals will be achieved. For example, Connecticut's upgraded program calls for the implementation of nutrient management on 50 percent of the state's dairy operations by 2004, and on all of them by 2014. Cooperative efforts by the USDA Natural Resources Conservation Service and University of Connecticut Cooperative Extension System already have resulted in nutrient management plans being implemented by 20 percent of the state's dairy farms and are expected to meet the 50 percent goal by 2004. The states' Coastal Nonpoint Pollution Control Programs, which were conditionally approved by EPA and NOAA in 1998, describe nonpoint source management programs targeting sources that affect their coastal waters. Final approval, which is largely dependent on the states confirming that they have the authorities necessary to require the implementation of best management practices for different categories of land use, is expected to be granted by late 2001. Both programs were developed and approved consistent with EPA guidance, and together describe best management practices, strategies, policies, programs, and enforceable mechanisms designed to address a wide range of nonpoint source problems. EPA records indicate that both states have invested significant resources in programs and projects aimed at reducing nonpoint sources of nitrogen, and that both states are committed to continuing to do so.

Section VI.B.2. states that the technical basis for the reasonable assurance that the out-of-basin load allocation will be achieved is the same as that for the in-basin load. It further states that EPA will work with Connecticut, New York, and the three other Connecticut River basin states (Massachusetts, New Hampshire, and Vermont) to coordinate the development and

implementation of out-of-basin load reduction strategies. EPA supports this approach and is committed to working with the three northern states to address nitrogen loads affecting Long Island Sound through their nonpoint source management programs. Further, EPA is already participating with the affected states and New England Interstate Water Pollution Control Commission to conduct a nutrient monitoring program. The scoping and development of that project is underway and demonstrates our commitment to achieving nonpoint source reductions.

EPA finds that the level of reduction of atmospheric deposition of nitrogen used in the TMDL is reasonable since it is taken from EPA estimates on the effect of implementation of CAA controls and its enforceable requirements. TMDL Section VII.D provides details of the CAA and its contribution to the goals of nitrogen reduction for the Sound.

In addition to the pollution reductions described above, non-treatment alternatives are needed to fully attain water quality standards. Section V.C of the TMDL identifies the different alternatives available, provides perspective on the viability of each, and identifies the process and schedule for evaluating, demonstrating, and implementing a viable non-treatment alternative(s) to attain water quality standards. The TMDL uses one of the non-treatment alternatives, mixing/aeration, as an example of how water quality standards can be attained. The TMDL cites feasibility studies that suggest that certain "hotspot" areas of the Sound not attaining DO standards after the Phase III and Phase IV nitrogen and carbon load reductions are achieved could be aerated to attain DO standards. However, additional study is required before it can be determined with confidence which non-treatment alternatives are viable options and whether they would result in full attainment of water quality standards when implemented.

EPA concludes that the preliminary analysis described in the TMDL supports the view that non-treatment alternatives are technically feasible and, in the case of mixing/aeration, could result in the full attainment of water quality standards. Furthermore, the TMDL identifies clear commitments by the States to assess, select, and implement the preferred alternative based on a consideration of environmental and economic factors. However, if additional assessment of non-treatment alternatives concludes that none is a viable option for attaining water quality standards, then the TMDL would need to be revised to identify additional pollutant reductions that would result in attainment of water quality standards. EPA recognizes that the TMDL is based on the phased implementation of controls and reassessment of management goals throughout the implementation plan. A key component of the TMDL is its reassessment (Table 14 of the TMDL document) using enhanced water quality models and monitoring data to assess improvements in DO as a result of control actions, adoption and revision of DO criteria based on EPA's salt water DO criteria (by 2003), and the assessment of non-treatment alternatives. The TMDL will be revised, as necessary, by 2004 and will provide more detailed implementation plans and schedules for Phase IV and V, including the selection and implementation of a non-treatment control technology. The selection of the Phase V non-treatment alternative will be based upon

the improvements in ambient DO levels resulting from control actions that have been implemented, the impact of adopting the EPA salt water DO criteria, improved model analyses, and the results of the analyses of the non-treatment alternatives themselves (including issues of feasibility and potential adverse environmental consequences).

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.

A. *Phase III Actions for Hypoxia Management*

The states, in cooperation with the Long Island Sound Study (LISS), utilized a variety of outreach mechanisms to solicit public input during the development of the *Phase III Actions for Hypoxia Management*, which established the "in-basin" nitrogen reduction target 58.5 percent and subsequently became the central component of the TMDL. In addition to mailing more than 4,000 copies of the Phase III plan to municipalities, environmental organizations, and interested citizens, the Long Island Sound Study conducted a series of 12 public meetings in September 1997 to present and answer questions about the plan. A total of 125 people attended the six New York meetings, and 91 attended the six Connecticut meetings. The states also conducted several targeted meetings for municipal representatives; in Connecticut, more than 50 municipalities sent representatives to the meetings and heard presentations by CTDEP and EPA staff on the Phase III strategy and implications for their communities. Although the LISS did not conduct a formal public comment period, it did receive some written comments which were considered by the states during development of the TMDL.

B. Draft TMDL

In November 1999, CTDEP and NYSDEC mailed the draft TMDL to municipalities, environmental organizations, and interested citizens and established a 45-day public comment period (through January 9, 2000). The comment period was subsequently extended to January 28 by CTDEP and February 9 by NYSDEC in response to several requests for more time. In December 1999, the states conducted a series of public meetings to present the draft TMDL and answer questions about the plan. In Connecticut, afternoon and evening sessions were held at three locations for a total of six meetings. In addition, fact sheets with background information on the TMDL were made available at the meetings and mailed to municipal officials, sewage treatment plant operators, regional planing organizations, and state and federal legislators. CTDEP also posted the TMDL, fact sheets, and public meeting schedule on its website. As a

result of these efforts, NYSDEC received 13 comment letters and CTDEP received 20, for a total of 33 comment letters. EPA also submitted comments to the states outside the formal public comment period.

In response to these comments, the states included in the final TMDL the individual WLAs, shifted the New York City CSO loads from the nonpoint to the point source category, enhanced the rationale for splitting the Connecticut CSO load between the point and nonpoint source categories, and provided more detailed descriptions of attenuation factors, the potential benefits of a nitrogen credit trading program, and the Phase IV actions (reductions in out-of-basin tributary and atmospheric deposition loads). They also wrote responses to individual comments received during the public comment period and from EPA which are provided as part of the TMDL submittal package.

C. Connecticut WLAs

Connecticut also conducted a separate public participation process to support development of the WLAs for Connecticut point sources. CTDEP conducted six public meetings that were attended by 120 people, and received 24 comment letters. The approximately 105 individual comments were organized into15 general categories, responses to which are also provided as an addendum to the TMDL submittal package.

In response to these comments, CTDEP did alter the WLA for the Newtown sewage treatment facility because the 1997-99 average flows used to establish the baseline did not accurately reflect the fact that it was a new facility that was still expanding its service area during that time period.

In summary, Connecticut and New York have conducted an extensive public participation process and taken all comments into consideration either through revisions to the TMDL document or through their respective “response to public comments” and “response to EPA comments” documents.

D. Comments submitted to EPA

In addition to the comments on the TMDL submitted to the states, EPA received a January 17, 2001 letter from Nixon Peabody LLP on behalf of the Sound Nitrogen Management Coalition, a group of small municipal wastewater agencies on the north shore of Long Island. The letter questions the application of equivalency factors, which were presented in TMDL Section VI.A.1, to the north shore embayments. The letter states that the equivalency factors that would govern any reallotment of allocations among different geographic areas were developed based on the assumption that nitrogen discharged into the head of the embayments is delivered into the open waters of the Sound without attenuation (by assuming that nothing happens to the nitrogen as it

travels through the bay and, as a result, "incorrectly penalize the dischargers to the embayments on the north shore of Long Island."

There are three points in particular that EPA believes are relevant to this issue. First, the water quality model from which the equivalency factors were developed does not assume that nitrogen discharged into the head of the embayments is delivered into the open waters of the Sound without attenuation. The LIS 3.0 model includes segments within the embayments. Nitrogen entering a segment representing an embayment is subject to the modeled physical, chemical, and biological processes. These processes include uptake by phytoplankton, burial of organic matter in sediment, and denitrification. These processes alter the forms of nitrogen and the amount of nitrogen exchanged with adjacent model segments. As a result, EPA believes that the LIS 3.0 model accurately and adequately represents the effect of nitrogen discharges from different geographic areas on oxygen levels in the Sound. Second, the equivalency factors represent the impact of the cumulative discharge of nitrogen from a management zone relative to other management zones; the impact of individual dischargers within a management zone was not calculated and would vary from the average assigned to the zone.

Finally, the TMDL highlights a number of areas where additional work is warranted to reduce uncertainties in the analysis. Any embayment-specific modeling or studies that would refine the equivalency factors should be incorporated into the next TMDL analysis.

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.

CTDEP signed its complete TMDL on December 28, 2000 (received by EPA on January 8, 2001). NYSDEC submitted the TMDL to EPA on January 8, 2001 and the public responsiveness document on February 1, 2001.

References

i. State of Connecticut, Department of Environmental Protection. 1996. Water Quality Standards. CTDEP, Hartford, CT.

ii. Clean Coastal Waters: Understanding and Correcting Nutrient Pollution. National Research Council. 2000.

iii. Water Quality Modeling Analysis of Hypoxia in Long Island Sound using LIS 3.0. Prepared for the Management Committee of the Long Island Sound Study and the New England Interstate Water Pollution Control Commission. HydroQual. 1996.

iv. November 4, 1994 letter from Jay Taft, Chair, LISS Model Evaluation Group to Mark Tedesco, EPA Long Island Sound Office.