

January 26, 2000

David Van Wie  
Maine Department of Environmental Protection  
#17 State House Station  
Augusta, Maine 04333-0017

**SUBJECT: Notification of Approval of Cobbossee Lake TMDL**

Dear Mr. Van Wie:

Thank you for your submittal of the Cobbossee Lake Total Maximum Daily Load (TMDL) for total phosphorus. This waterbody is included on Maine's 1998 303(d) list as a high priority for TMDL development to address algae blooms due to excessive nutrient loading.

The U.S. Environmental Protection Agency (EPA) hereby approves Maine's Cobbossee Lake TMDL, which consists of the Cobbossee Watershed District's 1995 TMDL report and ME DEP's October 14, 1999 addendum. EPA has determined that the Cobbossee Lake TMDL meets the requirements of §303(d) of the Clean Water Act (CWA), and of EPA's implementing regulations (40 CFR Part 130). Attached is a copy of our approval documentation.

We are very pleased with the quality of your TMDL submittal and the original work prepared by the Cobbossee Watershed District. The District and your staff have done an excellent job of preparing a comprehensive and informative TMDL report.

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

Sincerely,

Linda M. Murphy, Director  
Office of Ecosystem Protection

cc: David Courtemanch, ME DEP  
David Halliwell, ME DEP  
William Monagle, CWD

In-house distribution:

Jennie Bridge  
Alison Simcox  
Ann Williams  
Steve Silva

C:\Data\FY00JEB\TMDL\Cobbossee L\cobapr.wpd

1/21/00

EPA-NEW ENGLAND'S REVIEW of MAINE'S  
**COBBOSSEE LAKE TMDL**

**TMDL :** Cobbossee Lake, Kennebec County, Maine  
(ME ID# 334-5236 Cobbosseecontee L. /Winthrop/5543acres/blooms/ <2000)  
5 Towns border: Winthrop, Manchester, Monmouth, West Gardiner, Litchfield  
2 Towns also in watershed: Readfield, Wales

**IMPAIRMENT/POLLUTANT:** Algae blooms due to excessive nutrient loading. The TMDL is proposed for total phosphorus (personal communication, David Halliwell, ME DEP, 10/16/99).

**BACKGROUND:** In 1995, the Maine Department of Environmental Protection (ME DEP) submitted to EPA-New England a draft TMDL for total phosphorus for Cobbossee Lake. The draft TMDL was based on a February 1995 report prepared by the Cobbossee Watershed District, Winthrop, ME, for an EPA-funded project. EPA provided comments on ME DEP's submission on April 20, 1999. On October 14, 1999, ME DEP submitted a final TMDL, which consists of the following documents:

- *Cobbossee Lake Total Maximum Daily Load (TMDL): Restoration of Cobbossee Lake Through Reduction of Nonpoint Sources of Phosphorus* (Cobbossee Watershed District, February 1995).
- *Addendum to the 1995 Cobbossee lake Total Maximum Daily Load* (ME DEP, October 14, 1999).

Also included in the approval file are the following public participation materials received from the Cobbossee Watershed District, on January 3, 2000:

- Invitational brochure to lakeshore residents for the June 18, 1994 Cobbossee Lake Conference.
- Poster inviting the public to attend for the June 18, 1994 Cobbossee Lake Conference.
- June 13, 1994 newspaper advertisement for the June 18, 1994 Cobbossee Lake Conference.
- June 15, 1994 article on June 18, 1994 Cobbossee Lake Conference.
- July 1994 mailing from CWD staff to participants of the June 18, 1994 Cobbossee Lake Conference, requesting volunteers for three action committees for Cobbossee Lake.
- March 4, 1996 newspaper article advertising three meetings CWD scheduled with municipal officials from the towns bordering Cobbossee Lake: March 27, 1996, May 1, and June 5.

**REVIEWERS:** Jennie Bridge (617-918-1685) E-mail: [bridge.jennie@epa.gov](mailto:bridge.jennie@epa.gov)  
Alison Simcox, Ph.D. (617-918-1684) E-mail: [simcox.alison@epa.gov](mailto:simcox.alison@epa.gov)

## STATUTORY AND REGULATORY REQUIREMENTS OF TMDLs

\_\_\_\_\_ *Section 303(d) of the Clean Water Act and EPA's implementing regulations at 40 C.F.R. Part 130 describe the statutory and regulatory requirements of TMDLs. These requirements, which must be described in TMDLs both submitted by States and established by EPA, are described below.*

### **1. Loading Capacity**

*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). As described in EPA guidance, a TMDL describes the loading capacity of water for a particular pollutant.*

The TMDL used in-lake total phosphorus (TP) data and a modification of the Dillon-Rigler model to establish an annual load for the waterbody:

<u>In-Lake Concentration</u>		<u>Annual load</u>
<b>15 ug/l*</b>	Goal or target to meet water quality standards	<b>5,904 kg P/yr**</b>
17.5 ug/l (1992)	Summer-long bloom/non-attainment of WQS	6,888 kg P/yr

\* 1 ug/l is approximately equivalent to 1 ppb.

\*\* Throughout this report, phosphorus (P) means total phosphorus (TP).

In 1995, the Cobbossee Water District (CWD)'s report identifies 15 ug/l TP as an "interim" goal and 12 ug/l as an "ideal" goal. ME DEP has clarified that the TMDL is based on attainment of the 15 ug/l TP target and that modeling results estimate an allowable maximum annual load of 5,904 kg phosphorus per year (kg P/yr).

Maine water quality standards require GPA classified lakes to be "free of culturally induced algal blooms which impair their use and enjoyment" [38 MRSA 465-A (1) (B)]. ME DEP clarifies that the "target of 15 ug/l (5,904 kg P/yr in Cobbossee Lake) is deemed sufficient to meet Maine DEP water quality goals" (page 5, 10/14/99 report). ME DEP's functional definition of nuisance algae blooms includes episodic occurrence of Secchi disk transparencies < 2 meters for lakes with low levels of apparent color (<30 SPU) (page 4, 10/14/99 report).

Based on ME DEP's analysis of a state-wide limnological database for Maine, ME DEP believes that a target of 15 ug/l TP represents a "fairly conservative goal", because "a range of 15-17 ug/l may not necessarily result in the planktonic growth of algae which causes Secchi disk transparency (SDT) to be less than 2.0 meters" (page 5, 10/14/99 report). Furthermore, reviews of Cobbossee Lake water-quality data from 1980 to 1997 indicate that in-lake mean annual TP concentrations less than 17 ug/l do not result in a violation of state water-quality standards for algae blooms (see section 4 below, "Margin of Safety" for further discussion).

The TMDL for Cobbossee Lake is expressed as a maximum annual load. The statute defines TMDL as a total maximum daily load. However, the TMDL regulations, as specified in 40 CFR 130.2 (i), provide flexibility. TMDLs may be expressed in terms of either mass per unit time, toxicity, or other appropriate measure. For most lakes, expressing a nutrient TMDL in terms of allowable annual loading is appropriate for several reasons, including the lake turnover rate and

the fact that loads accumulate throughout the year (page 5, 10/14/99 report). Cobbossee Lake has a hydraulic retention time of about one flush per year (1.07 flushes/yr). This means that pollutants entering the lake will remain in the pond for a long time, and that nutrients entering the lake in the fall or winter may still be available for algae growth the following summer.

*Assessment:* EPA-New England concludes that the loading capacity has been appropriately set at a level necessary to attain and maintain applicable water quality standards. The TMDL is based on a reasonable and widely accepted approach to establish the relationship between pollutant loading and water quality.

The 15 ppb target concentration was selected based on review of statewide water quality data for lakes in Maine, lake specific data for Cobbossee Lake, and on water-quality goals of ME DEP. EPA-New England is satisfied that this review was thorough and, based on our review, EPA concurs that the available data support the conclusion that an in-lake concentration of 15 ug/l TP will attain Maine's water quality standards.

EPA-New England also concurs with expressing the TMDL as an annual loading based on the reasons provided by ME DEP.

## **2. 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(g).*

Cobbossee Lake is a Class GPA water in Maine. According to Maine statute, "There may be no new direct discharge of pollutants into Class GPA waters." [38 MRSA 465-A (1) (c)] The 1995 TMDL report addresses only nonpoint and background sources of pollution. ME DEP states that point sources "are not found in Cobbossee Lake", and clarifies that "WLAs are set equal to zero" (page 5, 10/14/99 report).

*Assessment:* EPA-New England concludes that the WLA component of the TMDL is appropriately set equal to zero based on ME DEP's determination that there are no point sources present in Cobbossee Lake.

## **3. 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(h). Load allocations may range from reasonably accurate estimates to gross allotments. 40 C.F.R. § 130.2(g).*

To achieve the in-lake level of 15 ug/l phosphorus, CWD calculated that the total load of phosphorus contribution must be limited to 5,904 kg/yr. The TMDL allocates all of this loading

capacity to existing and future nonpoint sources and to natural background. Based on CWD's estimate of the most likely level of current loadings at 6,888 kg/yr, a net reduction of 984 kg/yr, or 14% of current loadings, must therefore be achieved. The TMDL submission provides an extensive and detailed discussion of various steps that could be taken to implement these reductions (see section 6 below, "Implementation Plans").

*Assessment:* EPA-New England concludes that load allocations are adequately specified in the TMDL at levels necessary to attain and maintain water quality standards. The degree of load reductions necessary to achieve the in-lake phosphorus levels is based in part on an estimate of current loadings. The TMDL document describes three estimates for existing phosphorus loads (low, high, and most likely or "best estimate"), and an explanation for why the "best estimate" is chosen for the purpose of determining necessary load reductions. EPA believes that CWD and the State have made reasonable judgments about current loads, where the "best estimate" values correlate well with modeled predictions and monitoring data.

#### **4. 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 effluent limitations 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.*

A Margin of Safety (MOS) is implicit in the selection by the Cobbesee Watershed District and ME DEP of an in-lake TP concentration of 15 ug/l as the target for meeting State water-quality standards.

Based on ME DEP's analysis of a state-wide limnological database for Maine, ME DEP believes that a target of 15 ug/l TP represents a "fairly conservative goal", because "a range of 15-17 ug/l may not necessarily result in the planktonic growth of algae which causes Secchi disk transparency (SDT) to be less than 2.0 meters" (page 5, 10/14/99 report), the episodic SDT threshold in ME DEP's functional definition of nuisance algae blooms for lakes with low levels of apparent color (<30 SPU) (page 4, 10/14/99 report).

Both ME DEP and EPA-New England reviewed Cobbesee Lake water-quality data from 1980 to 1997 and found that data from each year for which adequate data were available could be placed into one of three categories: (1) attainment of water-quality standards, (2) potential for non-attainment, and (3) non-attainment (fax of CWD's "Cobbesee Lake Water Quality Data" and David Halliwell's data analysis, 12/23/99). The first category included data for 5 years during which mean annual TP concentrations were recorded at 16 ug/l or less. These TP concentrations, in general, were associated with minimum annual SDT depths of 2 meters or more and maximum annual chlorophyll a concentrations of 16 ug/l or less (ranging from 10-16 ug/l). According to ME DEP, no nuisance algae blooms occurred during any of these years, based on an analysis of the TP, SDT, and chlorophyll a data (personal communication with David Halliwell, ME DEP, 12/27/99).

The second category included data for six years during which mean annual TP concentration was recorded at 17 ug/l. This TP concentration, in general, was associated with minimum annual SDT depths of about 2 meters or less (ranging from 1 to 2.5 meters) and maximum annual chlorophyll a concentrations of about 20 ug/l (ranging from 11-23 ug/l). An analysis of the TP, SDT, and chlorophyll a data do not yield a conclusive determination of whether or not non-attainment blooms occurred during those years.

The third category included data for four years during which mean annual TP concentration was recorded at 18 or 19 ug/l. These TP concentrations, in general, were associated with minimum annual SDT depths of 2 meters or less and maximum annual chlorophyll a concentrations greater than 20 ug/l. According to ME DEP, conditions indicated probable algal blooms during each of these years (1980, 1985, 1992, and 1994) (personal communication with David Halliwell, ME DEP, 12/27/99 ).

In summary, based on both an analysis of Maine state-wide lakes water quality database, and on a review of Cobbossee Lake water-quality data from 1980 to 1997, in-lake mean annual TP concentrations less than 17 ug/l do not result in a violation of state water-quality standards for algae blooms. The difference between the in-lake target of 15 ug/l TP and 16 ug/l TP (a level at which water quality standards are attained) represents a 6% (394 kg P/yr) MOS.

*Assessment:* EPA-New England concludes that adequate MOS is provided for the following reasons:

1. EPA believes a significant implicit MOS is provided in the selection of an in-lake TP concentration of 15 ug/l. The adequacy of this MOS is supported by CWD's and ME DEP's reviews of in-lake TP, Secchi Disk Transparency, and chlorophyll a data from 1980-1997, which indicate that Cobbossee Lake does not experience algae blooms at 15 or 16 ug/l TP, and only rarely at 17 ug/l TP concentration.
2. The Cobbossee Watershed District has a commitment to conduct regular, open-water lake monitoring to assess the adequacy of the TMDL and, if necessary, to revise the TDML. This provides EPA with additional assurance that water quality standards will ultimately be met in Cobbossee Lake.

## **5. Seasonal Variation**

*The statute and regulations require that a TMDL be established with seasonal variations. CWA 303(d)(1)(C), 40 C.F.R. § 130.7(c)(1).*

The Cobbossee Lake TMDL is developed to be protective of the most environmentally sensitive period (summer season), when conditions (such as higher temperatures, increased light intensity, evapotranspiration, and lower lake inflows from tributaries) are most favorable for growth of algae and aquatic plants. Therefore, the TMDL will also be protective of water quality during all other seasons, as well. In addition, Cobbossee Lake has an hydraulic retention time of roughly one year (1.07 flushes/year), so that phosphorus controls that are effective for any one season are expected to remain effective through the next three seasons.

*Assessment:* EPA-New England concludes that seasonal variation has been adequately accounted for in the TMDL because we agree that, given the year-long retention time, nonpoint source controls implemented to protect during the most vulnerable summer season will protect water quality throughout the year, given the relatively long hydraulic retention time of Cobbossee Lake.

## **INFORMATION GENERALLY NECESSARY FOR EPA TO DETERMINE THE STATUTORY AND REGULATORY ADEQUACY OF TMDLS**

*Consistent with existing policy, the following information, although not statutory or regulatory requirements of TMDLs, will generally be necessary for EPA to determine if a submitted TMDL fulfills the legal requirements for approval under Section 303(d) and EPA regulations.*

### **1. Submittal Letter**

*Each final TMDL submitted to EPA should be accompanied by a submittal letter that explicitly states that the submittal is a final TMDL submitted under § 303(d) of the Clean Water Act for EPA review and approval. The submittal letter should reference the waterbody as it is identified on the State's section 303(d) list, including the pollutant of concern and the priority ranking of the waterbody. This clearly establishes the State's intent to submit, and EPA's duty to review, the TMDL under the statute.*

*Assessment:* The final TMDL submission includes a submittal letter which identifies:

- the TMDL as final for EPA approval under §303(d) of the Clean Water Act,
- the affected waterbody as identified on the 303(d) list,
- the pollutant for which the TMDL is being proposed, and
- the priority ranking of Cobbossee Lake.

### **2. Description of the Applicable Water Quality Standards and Numeric Water Quality Target**

*The TMDL submittal or EPA-established TMDL should include a description of the applicable State water quality standard, including the designated use(s) of the waterbody, the applicable numeric or narrative water quality criterion, and the antidegradation policy. A numeric water quality target for the TMDL (a quantitative value used to measure whether or not the applicable water quality standard is attained) should be identified. If the TMDL is based on a target other than a numeric water quality criterion, a description of the process used to derive the target should be included in the submittal.*

Narrative water quality standards apply, and a 15 ppb phosphorus target is predicted to attain water quality standards. The TMDL report defines:

- Designated uses (by referring to class GPA, or Great Ponds Class A: drinking water after disinfection, recreation in and on the water, fishing, industrial process and cooling water supply, hydroelectric power generation, navigation, and as habitat for fish and other aquatic life). [38 MRSA § 465-A (1) (A)].
- Nature of the water quality problems and impairments to designated uses, such as algae blooms, plus trophic status indicators showing moderately high total phosphorus concentrations, and Secchi disk transparency (SDT) below average for Maine lakes;



- Applicable water quality criterion (“Class GPA waters shall have a stable or decreasing trophic state, subject only to natural fluctuations and shall be free of culturally induced algal blooms which impair their use and enjoyment.”[38 MRS § 465-A (1) (B)]).

ME DEP’s functional definition of nuisance algae blooms includes episodic occurrence of Secchi disk transparencies (SDTs) <2 meters for lakes with low levels of apparent color (<30 SPU) (page 4, 10/14/99 report).

*Assessment:* EPA concludes that ME DEP has properly presented its water quality standards and has made a reasonable interpretation of the narrative water quality criteria in the standards when setting a numeric water quality target.

### **3. Description of Pollutant Sources**

*The TMDL submittal or EPA-established TMDL should include a description of the point, nonpoint, and natural background sources of the pollutant of concern, including the magnitude and location of the sources.*

Existing sources of pollution are identified as cultural and natural background non-point sources. The TMDL identifies and quantifies the following source categories:

- Watershed nutrient loading according to land use;
- Watershed nutrient loading further grouped according to tributary sub-basins;
- Internal nutrient recycling from lake bottom sediments for Annabessacook Lake, a contributor to Cobbossee Lake via Jug Stream;
- Internal nutrient recycling within Cobbossee Lake (page 7, 10/14/99 report);
- Atmospheric deposition (Appendices A and B, 1995 report);
- Septic systems (accounted for in low- and high-density residential data columns in Table 1-3, pages 7,9, and 11, 1995 report)

The loadings from cultural nonpoint sources (agricultural and development) and background nonpoint sources (four categories: forest, wetland, lakes/ponds, “open” (undeveloped land) (page 5, 1995 report)) were allocated by:

- Land use (six categories of agriculture and eleven categories of development types);
- Drainage area (direct and tributaries); and
- Town.

The pollutant loadings were based on phosphorus export coefficients assigned to each land use parcel (page 5, 1995 report). These coefficients were based on coefficients used in a CWD study assessing land use in the neighboring (upstream) Annabessacook Lake watershed, which in turn were derived from literature values (Reckhow et al 1980), and best professional judgement.

*Assessment:* EPA concludes that the TMDL document has done an admirable job of characterizing Cobbossee Lake’s sources of impairment.

### **4. Linking Water Quality and Pollutant Sources**

*The TMDL submittal or EPA-established TMDL should describe the rationale for the analytical method*

*used to establish the cause-and-effect relationship between the numeric target and the identified pollutant sources. Supporting documentation for the analysis should also be included, including the basis for assumptions, strengths and weaknesses in the analytical process, results from water quality modeling, etc.*

The TMDL report quantifies known sources of total phosphorus due to cultural and natural background nonpoint sources. The CWD used an empirical model to establish the relationship between pollutant loading and water quality in lakes, and applied phosphorus export coefficients to land area with specified land uses to estimate the load. These analytical methods are widely recognized as appropriate for lake TMDL development.

The TMDL was developed using “the Vollenwieder (1969) empirical model, as modified by Dillon 1974 and Dillon and Rigler (1974a, 1974b, 1975), and Kirchner and Dillon (1975), taking into account regionally applicable phosphorus retention coefficients (Larsen and Mercier 1976)” (page 6, 10/14/99 report). Use of the Dillon-Rigler model alone to estimate loading capacity is an approach widely used among lake managers in New England. The data set used to develop the Dillon-Rigler model includes data from 14 Canadian Shield lakes. In comparison, the data-set used to develop the Larsen-Mercier phosphorus retention term, used for Cobbossee Lake, includes data from 20 lakes in the EPA National Eutrophication Survey (EPA-NES) for the northeast and north-central U.S. lakes, providing a more accurate model for Cobbossee Lake.

Although internal recycling is not explicitly addressed in the TMDL, internal recycling is “intrinsically addressed through use of the empirically derived Dillon and Rigler model” (page 7, 10/14/99 report). Internal recycling is addressed by the retention coefficients that take into account phosphorus loss to sediments and recycling. Atmospheric deposition is assigned a phosphorus export coefficient of 0.11 kg P/ha/yr which represents a phosphorus load of 236.17 kg P/yr. Consideration of septic systems is incorporated into the choice of phosphorus export coefficients for low and high density residential development.

Cobbossee Lake results were cross-checked by comparing annual load calculations from the model to actual data from 1992 (i.e., when 4,200 kg P/yr direct watershed estimate is added to Jug Stream load, the total of 6,875 kg P/yr is extremely close to the 6,888 kg P/yr associated with the 1992 data corresponding to summer-long blooms).

*Assessment:* EPA concludes that the technical approach used by CWD is reasonable and consistent with widely accepted methods commonly used in lake nutrient management studies.

## **5. 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), calls for a monitoring plan when a TMDL is developed under the phased approach. The guidance provides that a TMDL developed under the phased approach also needs to provide assurances that nonpoint source control measures will achieve expected load reductions. The phased approach is appropriate when a TMDL involves both point and nonpoint sources and the point source WLA is based on a LA for which nonpoint source controls need to be implemented. Therefore, EPA’s guidance provides that a TMDL developed under the phased approach is to 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.*

CWD has had an ongoing water quality monitoring program of Cobbossee lake during the open water months since 1980 and anticipates continuing the program indefinitely. Parameters measured on a bi-weekly basis include: Secchi disk transparency, dissolved oxygen, temperature, total phosphorus, chlorophyll-a, total alkalinity, and pH (page 8, 10/14/99.)

*Assessment:* EPA-New England concludes that the ongoing monitoring by CWD is sufficient to evaluate the adequacy of the TMDL.

## **6. Implementation Plans**

*In August 8, 1997, Bob Perciasepe issued a memorandum, "New Policies for Establishing and Implementing Total Maximum Daily Loads (TMDLs)," that directs Regions to work in partnership with States 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 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; a public participation process; and recognition of other relevant watershed management processes. Although implementation plans are not approved by EPA, they may help establish the basis for EPA's approval of TMDLs.*

The Cobbossee Lake TMDL provides an implementation plan which describes the potential achievement of load allocations, and identifies timeframes for implementation, participating organizations, and potential funding sources. In a section entitled, "Recommendations", the TMDL report explores feasible sources of mitigation, gives recommended BMPs (page 13, 1995 report), and clearly identifies mechanisms and tangible targets for implementing phosphorus reduction activities, particularly for addressing surface runoff sources.

CWD estimated the reduction of phosphorus loading that could be achieved through implementation of best management practices (BMPs) from each type of land use (i.e., source category). These estimates incorporate two components: (1) estimation of treatment effectiveness for each type of BMP, and (2) estimation of the level of cooperation among landowners in implementing each BMP. CWD made a conscientious effort to make conservative estimates of treatment effectiveness (i.e., effectiveness is likely to be underestimated) because of uncertainties due to specific site conditions and proper operation and maintenance. For example, for structural BMPs requiring intensive maintenance, a conservative treatment factor was selected from the low end of the reported range of factors.

Estimated BMP treatment factors were then applied to the best estimates of current phosphorus loads from various land-use areas (i.e., source categories) to Cobbossee Lake. CWD estimated both conservative and more ambitious phosphorus load reductions that could be achieved by assuming two different levels of public cooperation.

With a low level of cooperation, results showed a reduction in annual phosphorus loading to the lake following BMP implementation of approximately 374 kg P/yr. For this estimate, it is assumed that 50% of farmers cooperate in implementing a fertilizer management plan on hayland, and 10% of landowners cooperate in implementing other types of BMPs. The Dillon-Rigler model indicates that the annual load of 6,518 kg P/yr resulting from these conservative

reductions will result in an average spring overturn lake P concentration below 17 ug/l (16.6 ug/l), but not sufficient to achieve the target lake concentration of 15 ug/l.

With a higher level of cooperation, results showed a reduction in annual phosphorus loading of about 717 kg P/yr. For this estimate, it is assumed that 20% of nearshore landowners (within 1,000 ft of the shore) and 10% of those further from the lake shore cooperate in implementing BMPs, and that 50% of farmers (hayland and pasture) in the Jock Stream subwatershed and 20 % of farmers elsewhere in lake watershed cooperate in implementing BMPs. In addition, some reductions are assumed in P contribution from roadways via a combination of structural BMPs and better road maintenance. The Dillon-Rigler model indicates that the annual load of 6,171 kg P/yr resulting from these higher reductions will result in an average spring overturn lake P concentration of 15.7 ug/l.

The CWD has provided sufficient evidence that they have identified areas where use of BMPs can result in significant reductions of phosphorus loading to Cobbossee Lake. Many of these areas are already receiving attention. The 10/14/99 report lists several implementation programs initiated in the watershed over the years. Since the target loading estimates were made, CWD has been awarded (1) a Section 319 grant (MDEP NPS #95-10) to address NPS pollution in the Cobbossee Lake watershed, including camp road and shoreline buffer strip demonstrations, watershed ecology and NPS workshops, and (2) a \$220,040 §319 restoration grant (99R-29) to abate watershed export of TP from camp roads and agricultural land in the Jock Stream subwatershed, which contributes almost one-half of phosphorus load to Cobbossee Lake (see Table 3, p. 12, 1995 report).

Currently, the CWD reviews new developments in the Cobbossee lake watershed to assure controlled, allowable increases in phosphorus export to the lake (see page 1, 1995 report for the formula which sets standards for phosphorus export for each town). Per acre allocations are calculated for each of the five towns immediately bordering Cobbossee Lake and for the Town of Wales, located in the Jock Stream subwatershed (page 23, 1995 report). The report anticipates that the potential future loads could be adjusted depending on the success or failure of a management program to reduce the annual loading from the watershed.

*Assessment:* EPA-New England concludes that CWD has done an admirable job in developing implementation plans to achieve the TMDL.

## **7. 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 is required in order for the TMDL to be approvable.*

*In a water impaired by solely by nonpoint sources, however, reasonable assurances are not required in order for a TMDL to be approvable. For such nonpoint source-only waters, States are encouraged to provide reasonable assurances regarding achievement of load allocations in the implementation plans described in section 7, above. As described in the August 8, 1997 Perciasepe memorandum, such reasonable assurances should be included in State implementation plans and “may be non-regulatory, regulatory, or incentive-based, consistent with applicable laws and programs.”*

ME DEP addresses reasonable assurances for achieving the pollutant reduction goals of the TMDL by detailing the CWD's track record in implementing NPS controls in the watershed (page 8, 10/14/99 report).

Furthermore, on October 13, 1999, EPA-New England approved ME DEP's *Nonpoint Source Pollution (NPS) Control Program Upgrade and 15 year Strategy*. Maine's plan, recognized by the EPA Washington office as "among the best" in the nation, outlines many realistic, yet aggressive, short and long-range goals and actions aimed at reducing pollution from major nonpoint source categories including transportation, forestry, agriculture, and development. The plan relies on strong partnerships and provides a commitment to providing outreach and technical assistance in priority NPS watersheds. Cobbossee Lake and Jock Stream are both on the 1998 303(d) list and Cobbossee Lake is on Maine's NPS priority watersheds list; both waterbodies have been given priority for funding under the implementation of Maine's §319 portion of the NPS program.

*Assessment:* EPA-New England concurs that CWD's track record of restoration work in the Cobbossee watershed is commendable. This record and the ME DEP's strong NPS strategy, provide reasonable assurance that load allocations will be achieved.

## **8. Public Participation**

*EPA policy is that there should be full and meaningful public participation in the TMDL development process. Each State should therefore provide for public participation consistent with its own public participation requirements. In guidance, EPA has explained that final TMDLs submitted to EPA for review and approval should describe the State's public participation process, including a summary of significant comments and the State's responses to those comments. When EPA establishes a TMDL, EPA regulations require EPA shall publish a notice seeking public comment. 40 C.F.R. § 130.7(d)(2).*

*Inadequate public participation is not a basis for disapproving a TMDL; however, where EPA determines that a State has not provided adequate public participation, EPA may defer its approval action until adequate public participation has occurred, either by the State or by EPA.*

The public participation process followed by ME DEP for riverine-based TMDLs over the past two years is as follows (personal communication with David Halliwell, ME DEP, 12/29/99):

1. Locally advertise availability of draft TMDL document, invite public comment, and provide deadline for written response; direct mail copies of the draft TMDL to known interested parties;
2. Provide for a public meeting if significant interest is indicated;
3. Prepare summary of public comment and Department's response; provide commenters with copy of Department's response report;
4. Submit response report with draft TMDL to EPA for review and comment.

The riverine-based TMDLs approved using this public participation process were point source dominated; in some cases, consultants or professional staff prepared comments on behalf of affected dischargers on the highly technical TMDL reports.

In the case of the Cobbossee Lake TMDL, the ME DEP relied on the CWD to provide full and

meaningful public participation. Jeff Dennis, ME DEP, was an active participant in the public participation process (e-mail from David Halliwell, ME DEP, 12/23/99) and provided guidance and oversight throughout the TMDL development and public participation process (personal communication with Bill Monagle, CWD, 12/28/99).

The process followed by the CWD is as follows:

1. In spring 1994, a draft TMDL for Cobbossee Lake was prepared.
2. In late May or early June, tri-fold brochures were mailed to the roughly 700 lakeshore residents, inviting them to attend the Cobbossee Lake TMDL conference on June 18, 1994 (return registration requested by June 10). The conference was advertised more broadly in the watershed towns with 11 x 17 color posters describing the conference as a forum for “citizen involvement in decision making and action taking toward a cleaner future for Cobbossee Lake”. The public was alerted to “opportunities for exchanging information, discussing water quality goals and concerns, and identifying actions that we can take today” in the Cobbossee Lake watershed; posters were put up in Town Halls and local stores. A notice of the conference was published June 13, 1994 in the regional newspaper, and a June 15, 1994 article appeared which quoted the CWD as saying “The conference is aimed primarily at their [area residents and others who care about Cobbossee Lake] water quality concerns. We want to give them an opportunity to talk about that.” (Community Advertiser serving all the towns affected by the load allocation).
3. At the Cobbossee Lake conference on June 18, 1994, the CWD presented the Cobbossee Lake water quality goals of 15 and 12 ug/l and the supporting technical information (personal communication with Bill Monagle, CWD, 12/28/99). (The conference was described in ME DEP’s 10/14/99 report.) The conference yielded community feedback which CWD consolidated into recommended action steps.

In a July 1994 mailing to participants of the June 18<sup>th</sup> Cobbossee lake Conference, the CWD asked for volunteers to work with the District on three action committees (water quality, education, and regulation). The water quality action committee’s purpose was to establish water quality goals for the Lake, and consider the other water quality related recommended action steps from the June conference. Volunteers solicited for this committee formed the Cobbossee Lake Water Quality Citizen Committee which met several times. Minutes from this Committee’s meetings indicate that the citizen committee agreed to the 15 ug/l TP “interim” goal and the 12 ug/l “ideal” goal (personal communication with Bill Monagle, CWD, 12/28/99).

After the February 1995 report was sent to EPA (still considered a draft TMDL, subject to further revision), the CWD advertised a series of three workshops scheduled with municipal officials in the five towns to discuss the current status of Cobbossee Lake water quality, and the role of local officials in “guaranteeing a clear future for the lake.” (Community Advertiser, March 4, 1996) These workshops with municipal planning boards were also advertised by public notice in each town; town-by-town, CWD encountered no disagreement with the water quality goals of the TMDL or the load allocations presented in the TMDL (personal communication with Bill Monagle, CWD, 12/28/99).

4. Bill Monagle explained that the communities in the Cobbossee Watershed District are very

proactive and that there is a high level of trust among the communities and the CWD and their Board of Trustees (which has municipally appointed members). The public attending the conference, the committee representing the public attending the conference, and the local planning boards were very accepting of the work performed and presented by CWD on the TMDL for Cobbossee Lake. (Personal communication with Bill Monagle, CWD, 12/28/99) CWD provided EPA with a copies of the public outreach materials on January 3, 2000.

*Assessment:* EPA-New England notes that, although the ME DEP did not conduct its own public participation process for the Cobbossee Lake TMDL development process, the Department provided for public participation consistent with the intent of its own public participation requirements through reliance on and cooperation with the CWD. Although the current process of distributing a written TMDL and responses to public comment in writing were not the approach used by the CWD's public participation process, it appears reasonable to conclude that the intent of all elements of the State's public participation process were addressed. EPA concludes that the amount and quality of public participation was at least as good, if not far better, than provided for in the State's minimum requirements. CWD has done an admirable job of involving the public during the development of the TMDL, and has provided sufficient opportunities for the public to comment on the TMDL.