UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

JUN 0 3 2013

REPLY TO THE ATTENTION OF:

WW-16J

Rebecca Flood, Assistant Commissioner
Minnesota Pollution Control Agency
520 Lafayette Road North
St. Paul, Minnesota 55155-4194

Dear Ms. Flood:

The U.S. Environmental Protection Agency has conducted a complete review of the final Total Maximum Daily Loads (TMDLs) for the Ann River Watershed, including supporting documentation and follow up information. Ann River Watershed is located in Kanabec County and is within the St. Croix River Basin. The TMDLs address Aquatic Recreation Use impairments in Ann and Fish Lakes due to excess nutrients (total phosphorus), and in Ann River due to poor biotic condition and excess bacteria.

The TMDLs meet the requirements of Section 303(d) of the Clean Water Act and EPA's implementing regulations at 40 C.F.R. Part 130. Therefore, EPA hereby approves Minnesota's two TMDLs for total phosphorus, one TMDL for sediment that addresses biotic impairments, and one TMDL for *E. coli*. The statutory and regulatory requirements, and EPA's review of Minnesota's compliance with each requirement, are described in the enclosed decision document.

We wish to acknowledge Minnesota's effort in submitting these TMDLs and look forward to future TMDL submissions by the State of Minnesota. If you have any questions, please contact Mr. Peter Swenson, Chief of the Watersheds and Wetlands Branch, at 312-886-0236.

Sincerely,

Tinka G. Hyde
Director, Water Division

Enclosure

cc: Chris Klucas, MPCA
Jeff Risberg, MPCA

TMDL: Ann River Watershed, Kanabec County, MN
Date:

DECISION DOCUMENT FOR ANN RIVER WATERSHED TMDLs

Section 303(d) of the Clean Water Act (CWA) and EPA's implementing regulations at 40 C.P.R. Part 130 describe the statutory and regulatory requirements for approvable TMDLs. Additional 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. Use of the term "should" below denotes information that is generally necessary for EPA to determine if a submitted TMDL is approvable. These TMDL review guidelines are not themselves regulations. They are an attempt to summarize and provide guidance regarding currently effective statutory and regulatory requirements relating to TMDLs. Any differences between these guidelines and EPA's TMDL regulations should be resolved in favor of the regulations themselves.

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

The TMDL submittal should identify the waterbody as it appears on the State's/Tribe's 303(d) list. The waterbody should be identified/georeferenced using the National Hydrography Dataset (NHD), and the TMDL should clearly identify the pollutant for which the TMDL is being established. In addition, the TMDL should identify the priority ranking of the waterbody and specify the link between the pollutant of concern and the water quality standard (see Section 2 below).

The TMDL submittal should include an identification of the point and nonpoint sources of the pollutant of concern, including location of the source(s) and the quantity of the loading, e.g., lbs/per day. The TMDL should provide the identification numbers of the NPDES permits within the waterbody. Where it is possible to separate natural background from nonpoint sources, the TMDL should include a description of the natural background. This 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 spatial extent of the watershed in which the impaired waterbody is located;
(2) The assumed distribution of land use in the watershed (e.g., urban, forested, agriculture);
(3) Population characteristics, wildlife resources, and other relevant information affecting the characterization of the pollutant of concern and its allocation to sources;
(4) Present and future growth trends, if taken into consideration in preparing the TMDL (e.g., the TMDL could include the design capacity of a wastewater treatment facility); and

(5) An 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; chlorophyll-a (chl-a) and phosphorus loadings for excess algae; length of riparian buffer; or number of acres of best management practices.

Comment:

A. Location/ Spatial extent: The Minnesota Pollution Control Agency (MPCA) has developed TMDLs to address Aquatic Recreation impairments caused by excess nutrients in Ann (33-0040-00) and Fish Lakes (33-0036-00), and excess *E. coli* in Ann River (07030004-511). The TMDL study also addresses Aquatic Life impairments due to poor biology in Ann River (Table 1 in this decision document, Figure 1.1 in the TMDL). These waterbodies are within the Ann River watershed in central-east Minnesota in Kanabec County. The Ann River watershed is an 86 square mile subwatershed of the Snake River and part of the larger St. Croix River major basin. The watershed is contained in the North Central Hardwood Forest (NCHF) and the Northern Lakes and Forest (NLF) Ecoregions. Ann Lake is the most upstream water of the three addressed by this TMDL. Ann River flows from Ann to Fish Lake and is approximately 10 river miles in length. The outflow at Fish Lake discharges to the Snake River, and eventually to the St. Croix River. Both Ann and Fish Lake were created from dams on the Ann River and their nearshore regions support wildlife management areas, wetland habitat, and wild rice.

Land uses were determined from National Agricultural Statistical Survey (NASS) data from 2009 for both Ann Lake watershed and for the watershed draining to Ann River from Ann Lake outlet to Fish Lake outlet. The land uses in Ann Lake are 77% forested, 11% hay and pasture, 10% wetlands, 2% developed, and <1% other crops. By comparison, the Fish Lake drainage area downstream of Ann Lake is 53% hay and pasture, 33% forested, 5% wetlands, 4% developed, and 5% corn/soybeans/other crops (Figure 2.2 of the TMDL). MPCA did not identify any incorporated cities or towns in the watershed. The Cities of Mora and Ogilvie are near the watershed and have less than 5,000 people (Section 3.2 of the TMDL, Administrative Record No. 5).

Table 1. Waterbodies addressed in the Ann River Watershed TMDL.

Lake Name	Water ID	Year(s) Listed	Designated Use Impairment	Cause of Impairment	TMDL Developed
Ann Lake	33-0040-00	2004	Aquatic Recreation	Excess nutrients	Total Phosphorus
Fish Lake	33-0036-00	2004	Aquatic Recreation	Excess nutrients	Total Phosphorus
Ann River	07030004-511	2010	Aquatic Recreation	Excess bacteria	*E. coli*
Ann River	07030004-511	2002, 2010	Aquatic Life	Fish bioassessment (2002)/ Invertebrate bioassessment (2010)	Sediment (embedded)

B. Problem Identification:

I. Total phosphorus- MPCA found that Ann Lake and Fish Lake were not supporting Aquatic Life and Aquatic Recreation designated uses due to exceedence of eutrophication water quality criteria for total phosphorus and one or both Secchi disc and chl-a criteria. Ann and Fish Lake

had a mean annual phosphorus concentration of 90 and 162 µg/L, respectively (Table 2 in this decision document, Table 1.5 of the TMDL). In 2008 and 2009, MPCA and Kanabec Soil and Water Conservation District (SWCD) collected data specifically for TMDL development (Figure 4.1, Section 4.2.1 of the TMDL). Historical water quality data were available from 1990 to 2010 that were collected by MPCA, citizens on Ann Lake, and Kanabec SWCD (Appendix B of the TMDL).

Table 2. Mean water quality for Ann and Fish Lakes from 2008 and 2009 growing season data collected bi-weekly from May to September as compared to the NCHF shallow lake and NLF lake eutrophication criteria.

	TP (ug/L)	**Chl-a (ug/L)**	**Secchi disc (m)**
NLF Lake Standard	*30*	*9.0*	*2.0*
NCHF Shallow Lake Standard	*60*	*20*	*1.0*
Ann Lake growing season mean	90	42	0.9
Fish Lake growing season mean	162	64	0.8

II. E. coli- *E. coli* criteria include a geometric mean of 126 cfu/100 ml from no less than five samples per month; and no more than 10% of samples can exceed 1,260 cfu/100 ml. MPCA found that *E. coli* in Ann River exceeded the geometric mean criterion at four out of five stations from May to October, based on bacteria data collected by Mille Lacs and Kanabec SWCD from 2004-2010 (Figure 3.2 of the TMDL). Also, the acute criterion was exceeded more than the allowable frequency near County Road 14 (S003-782), which indicated bacteria impairment in Ann River (Table 1.4 and Section 3.3 of the TMDL).

III. Biota (embedded sediment)- MPCA and the SWCDs conducted a stressor identification analysis and found embedded sediment as the most probable cause of impairment. A poor biotic index score was given due to a lack of lithophils and benthic insectivores, which both rely on interstices of gravel and sand in the stream for food and reproduction. The lack of these species supported that embedded sediment is filling in the interstices and preventing a healthy aquatic assemblage (Section 5.2.3 of the TMDL). In addition, several sites on Ann River showed evidence of sediment accumulation (i.e., the majority sediment size in the stream was too large to be mobilized by the stream flow) (Table 5.7 of the TMDL). Furthermore, suspended sediment concentrations in Ann River were well below Minnesota's turbidity standard and within the lower percentiles of NCHF ecoregion reference streams, suggesting that aquatic life was not likely affected by suspended concentrations. Thus MPCA concluded embedded sediment was causing biotic impairment and a TMDL to address embedded sediment was completed (Section 5.2.1 of the TMDL).

C. Priority Ranking: MPCA's target start and completion dates for all of these waters are 2008 and 2013, respectively, and the short-term target dates imply priority to complete TMDLs. Target dates are based on data availability, the likelihood a TMDL can be completed, and that a water can be restored (Section 1.3.1 of the TMDL).

D. Source Identification:

I. Point sources-

MPCA identified two industrial point source discharges to Fish Lake. MPCA confirmed there were no other point source discharges in the Ann River watershed including no concentrated animal feeding operations (CAFO), active construction discharges, or individually permitted discharges. While there are no CAFO discharges, there are 13 registered feedlots with an approximate total of 1,227 animal units (Figure 3.7 of the TMDL). MPCA confirmed point source information by searching discharge data and consulting with MPCA personnel (Figure 4.16 and Section 4.7.2 of the TMDL).

II. Nonpoint sources-

a. Total phosphorus- In general, nonpoint sources of total phosphorus include erosion, direct watershed runoff, upstream lakes, groundwater, internal loading, and atmospheric deposition. Runoff and groundwater contain phosphorus from failing or illicit septic systems, feedlots, stormwater, wildlife, fertilizers, tributary loadings, and increasing numbers of rough fish in the lakes (Table 4.2, Figure 4.9 and 4.10 of the TMDL). A source assessment conducted in 2008 and 2009 estimated phosphorus loads to Ann Lake phosphorus in pounds per year: 5,728 (47%) from watershed runoff, 5,496 (46%) from internal load, 445 (4%) from septic systems, 209 (2%) from West Ann Lake (an adjacent wetland), and 185 (1%) from atmospheric deposition. Fish Lake phosphorus loads (lbs/year) were: 5,266 (42%) from upstream lakes, 4,808 (39%) from drainage areas, 1,425 (11%) from internal load, 904 (7%) from septic systems and 100 (1%) from atmospheric deposition (Figure 4.19 and 4.20 of the TMDL).

b. E. coli- MPCA identified septic systems and livestock, particularly pasturelands and manure spreading, as prominent sources of bacteria. MPCA estimated potential loads available from the watershed using assumptions based on available knowledge of septic system failure rates from the county, animal inventories, and pet waste. MPCA estimated the following percent contributions from these bacteria sources: livestock in upland pastures (54%), livestock in pastures near the waterway (28%), surface applied manure on cropland (16%), and failing septic systems/wildlife/pet waste (each <1%) (Tables 3.6, 3.7, and 3.8 of the TMDL).

c. Biota (embedded sediment)-MPCA found excess bedded sediment was the prominent cause of biotic impairment. MPCA found that the sources of embedded sediment were either from watershed runoff or streambank erosion. MPCA estimated 763 tons of sediment per year comes from the watershed using the Universal Soil Loss Equation (USLE) (Section 5.2.1 of the TMDL). The direct volume method estimated that 1,317 tons of sediment per year comes from streambank erosion (Section 5.2 of the TMDL).

E. Future Growth: MPCA expects that the current land uses are likely to remain constant over several decades. However to account for future phosphorus loads from construction, an allocation equal to 1.5% of the load capacity minus a margin of safety was assigned for future general permitted discharges of construction and stormwater to each lake (The allocation in Fish Lake also includes to two current industrial sources as well as future construction and industrial stormwater, see Section 5 of this decision document). MPCA indicates that if, in the future there are permitted Municipal Separate Storm Sewer Systems (MS4) discharges, a portion of the load allocation can be transferred to the WLA. Aside from the WLA to account for future construction, no other explicit allocation was given to future growth; future sources must comply with the existing TMDL (Section 3.6, Section 4.7.2.1, and Section 4.7.7 of the TMDL).

The EPA finds that the TMDL document submitted by the MPCA satisfies the requirements of the first criterion.

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

The TMDL submittal must include a description of the applicable State/Tribal water quality standard, including the designated use(s) of the waterbody, the applicable numeric or narrative water quality criterion, and the antidegradation policy (40 C.F.R. §130.7(c)(l)). EPA needs this information to review the loading capacity determination, and load and wasteload allocations, which are required by regulation.

The TMDL submittal must identify a numeric water quality target(s), a quantitative value used to measure whether or not the applicable water quality standard is attained. Generally, the pollutant of concern and the numeric water quality target are, respectively, the chemical causing the impairment and the numeric criteria for that chemical (e.g., chromium) contained in the water quality standard. The TMDL expresses the relationship between any necessary reduction of the pollutant of concern and the attainment of the numeric water quality target. Occasionally, the pollutant of concern is different from the pollutant that is the subject of the numeric water quality target (e.g., when the pollutant of concern is phosphorus and the numeric water quality target is expressed as dissolved oxygen (DO) criteria). In such cases, the TMDL submittal should explain the linkage between the pollutant of concern and the chosen numeric water quality target.

Comment:

A. Designated Uses: Minnesota Rule Chapter 7050 designates uses for waters of the state. Ann Lake, Fish Lake, and Ann River are designated as Class 2B waters for aquatic life and recreation use in the Minnesota Rule:

> Aquatic life and recreation includes all waters of the state that support or may support fish, other aquatic life, bathing, boating, or other recreational purposes and for which quality control is or may be necessary to protect aquatic or terrestrial life or their habitats or the public health, safety, or welfare. (7050.0140 (3)).

B. Standards:

I. Narrative Criteria- Minnesota Rule contains narrative criteria for Class 2 waters of the State:

> For all Class 2 waters, the aquatic habitat, which includes the waters of the state and stream bed, shall not be degraded in any material manner, there shall be no material increase in undesirable slime growths or aquatic plants, including algae, nor shall there be any significant increase in harmful pesticide or other residues in the waters, sediments, and aquatic flora and fauna; the normal fishery and lower aquatic biota upon which it is dependent and the use thereof shall not be seriously impaired or endangered, the species composition shall not be altered materially, and the propagation or migration of the fish and other biota normally present shall not be prevented or hindered by the discharge of any sewage, industrial waste, or other wastes to the waters. (7050.0150(3)).

II. Numeric criteria- Applicable numeric criteria for the Ann River Watershed TMDL are:

- For Ann Lake and Fish Lake- Eutrophication criteria for total phosphorus, chl-a, and Secchi disc depth, which are contained in Minnesota Rule 7050.0222 and in Table 2 in this document.
- For Ann River- *E. coli* criteria include a geometric mean of 126 cfu/100 ml from no less than five samples per month; and no more than 10% of samples can exceed 1,260 cfu/100 ml.
- For Ann River- Fish bioassessment scores must meet or exceed a value of 69, and invertebrate assessment scores must meet or exceed a score of 39.5 in low gradient sections (downstream of Highway 23, monitoring station 06SC122) and 41.2 in the remaining sections of Ann River (Section 1.3 and 1.4 of the TMDL). These scores are a function of fish abundance, composition, and species type that are expected in a well-functioning stream. For example, when the percent of lithophils, piscivores, and/or intolerant taxa are low in a stream, the biotic score will be low and reflect a degraded condition (Administrative Record No. 12).

C. Target:

*I. Ann River E. coli TMDL-*The *E. coli* target equals the water quality criterion of 126 cfu/100 ml.

II. Ann River biota (embedded sediment) TMDL- The biotic scores are 69 for Fish IBI and 39.5 and 41.2 for invertebrate IBI for the biota TMDLs (Section 1.3, Table 1.4, and Table 1.5 of the TMDL). MPCA assigned allocations to embedded sediment loads (tons/day) to address this identified cause of biotic impairment in Ann River (Section 5.3 of the TMDL).

III. Ann Lake and Fish Lake total phosphorus TMDL- MPCA selected a total phosphorus target of 60 µg/l for Ann and Fish Lakes. MPCA selected total phosphorus to address eutrophication problems based on the causal relationships between total phosphorus, chl-a, and Secchi disc (Section 1.3 of the TMDL). Chl-a and Secchi disc response to total phosphorus were identified during development of MPCA's lake eutrophication criteria. Based on these relationships, the TMDL will attain total phosphorus, chl-a, and Secchi disc standards (Section 4.7.5 of the TMDL). Given that the NLF-NCHF ecoregion boundary is at Ann Lake, resulting in two different standards that could be potentially applicable, the rationale for using NCHF standards for Ann Lake is described below.

IV. Use of NCHF total phosphorus at Ann Lake- A majority of the subwatershed of Ann Lake is forested and contained within the NLF ecoregion, whereas the Ann River and Fish Lake drainage area is contained within the NCHF watershed. The Ann River watershed transitions from predominantly forested to agricultural lands. In fact, the upstream drainage to Ann Lake is primarily forested (77%), where downstream, the Ann River and Fish Lake drainage areas are primarily hay and pasture (53%) (Table 3.1 of the TMDL). Although the NLF-NCHF boundary is at Ann Lake, MPCA deemed that the NCHF target was appropriate based on the following:

1. Minnesota's narrative water quality standards provide that where a lake, shallow lake, or reservoir border two ecoregions, the eutrophication standards must be applied on a case-by-case

basis (MN 7050.0222 Subpart 4A).

2. While land uses differ among the two lakes, the lakes have similar physical characteristics, similar water quality, and similar origin. Both lakes are similar in shape and size, maximum and average depth, littoral area, and residence time. The lakes meet the MPCA definition of shallow lakes.

3. The current phosphorus loads and resultant water quality in both lakes are similar, supporting that premise that both lakes respond similarly to phosphorus loads (Administrative Record No.4). Further, both lakes were formed from dams on the Ann River, resulting in similar lake morphology, with both lakes supporting Wildlife Management Areas, wetlands, and wild rice.

4. Using the NCHF standard at Ann Lake will require approximately a 30% decrease in current mean phosphorus levels, which will require reductions that are expected to decrease eutrophication at Ann Lake. If the NLF standard of 30 µg/L were the target selected for Ann Lake, additional reductions to meet 30 µg/L at Ann Lake would require aggressive management of internal loading, including alum treatments at a frequency that could be detrimental to the wild rice resource at Ann Lake, and wetland areas that support wildlife (TMDL executive summary, Administrative Record No. 6).

The EPA finds that the TMDL document submitted by the MPCA satisfies the requirements of the second criterion.

3. Loading Capacity- Linking Water Quality and Pollutant Sources

A TMDL must identify the loading capacity of a waterbody for the applicable pollutant. EPA regulations define loading capacity as the greatest amount of a pollutant that a water can receive without violating water quality standards (40 C.F.R. §130.2(f)).

The pollutant loadings may be expressed as either mass-per-time, toxicity or other appropriate measure (40 C.F.R. §130.2(i)). If the TMDL is expressed in terms other than a daily load, e.g., an annual load, the submittal should explain why it is appropriate to express the TMDL in the unit of measurement chosen. The TMDL submittal should describe the method used to establish the cause-and-effect relationship between the numeric target and the identified pollutant sources. In many instances, this method will be a water quality model.

The TMDL submittal should contain documentation supporting the TMDL analysis, including the basis for any assumptions; a discussion of strengths and weaknesses in the analytical process; and results from any water quality modeling. EPA needs this information to review the loading capacity determination, and load and wasteload allocations, which are required by regulation.

TMDLs must take into account critical conditions for steam flow, loading, and water quality parameters as part of the analysis of loading capacity (40 C.F.R. §130.7(c)(l)). TMDLs should define applicable critical conditions and describe their approach to estimating both point and nonpoint source loadings under such critical conditions. In particular, the TMDL should discuss

the approach used to compute and allocate nonpoint source loadings, e.g., meteorological conditions and land use distribution.

Comment: In equation form, the TMDLs may be expressed as:

$$TMDL = WLA + LA + MOS + RC;$$

Where the wasteload allocation (WLA) is the allowable loads given to point sources, Load Allocation (LA) is the allowable load to nonpoint sources, Margin of Safety (MOS) is either an implicit or explicit load to account for uncertainty in the TMDL, and Reserve Capacity (RC) is the load allocated to future growth. The loading capacities for the *E. coli,* total phosphorus, and biota (i.e., embedded sediment) TMDLs are in Tables 3 through 6 in this decision document. The *E. coli*, total phosphorus, and sediment TMDLs were developed using different approaches that are each discussed below (Sections 3, 4, and 5 of the TMDL).

Table 3. Ann River *E. coli* TMDL in billion organisms per day for the five flow zones. Estimated reductions needed from current conditions were not reported, although Figure 3.5 in the TMDL illustrates the magnitude of needed reductions.

Ann River	Very High (0-10%	High (10-40%)	Mid-Range (40-60%)	Low (60-90%)	Dry (90-100%)
Loading Capacity	638.6	146.5	51.3	27.0	15.8
WLA	0	0	0	0	0
LA	606.7	139.2	48.7	25.6	15.0
MOS	31.9	7.3	2.6	1.4	0.8

Table 4. Ann Lake TP current conditions, TMDL, and reductions.

Allocation	Source	Existing TP Load		TP Allocations		Load Reduction	
		lbs/year	lbs/day	lbs/year	lbs/day	lbs/year	%
Wasteload allocation	Construction and Industrial Stormwater	115	0.3	115	0.3	0	0%
Load Allocation	Drainage Areas	5,613	15.4	5,402	14.8	211	4%
	SSTS	445	1.2	0	0	445	100%
	West Ann Lake	209	0.6	203	0.6	6	3%
	Atmosphere	185	0.5	185	0.5	0	0%
	Internal Load	5,496	15	1,400	3.8	4,096	75%
Margin of Safety				384	1.1		
Total/Loading Capacity		12,063	32.7	7,689	21.1	4,758	36%

Table 5. Fish Lake TP current conditions, TMDL, and reductions.

Allocation	Source	Existing TP Load		TP Allocations		Load Reduction	
		lbs/year	lbs/day	lbs/year	lbs/day	lbs/year	%
Wasteload allocation	Construction and Industrial Stormwater	121	0.3	121	0.3	0	0%
Load Allocation	Drainage Areas	4,688	12.8	2,177	6	2,511	54%
	SSTS	904	2.5	0	0	904	100%
	Upstream Lakes	5,266	14.4	4,586	12.6	680	13%
	Atmosphere	100	0.3	100	0.3	0	0%
	Internal Load	1,425	3.9	258	0.7	1,167	82%
Margin of Safety				805	2.2		
Total/Loading Capacity		12,504	33.9	8,047	22	5,262	36%

Table 6. Ann River bedded sediment current conditions, TMDL, and reductions.

Allocation	Source	Existing Bedded Sediment Load		Bedded Sediment TMDL		Load Reduction	
		tons/year	tons/day	tons/year	tons/day	tons/year	%
Wasteload allocation	Construction and Industrial Stormwater	2	<0.1	2	0	0	--
Load Allocation	Watershed	763	2.1	763	2.1	0	0%
	Streambank	1,317	3.6	407	1.1	910	69%
Margin of Safety				45	0.1		
Total/Loading Capacity		2,082	5.7	1,217	3.3	910	44%

A. TMDL calculations:

I. Ann River E. coli TMDL- The *E. coli* TMDL was determined by generating a flow record and *E. coli* data to create a load duration curve. Current loading was assessed by examining the *E. coli* data with the load duration curve. The loading capacity was then allocated to point, nonpoint sources, and a MOS.

a. Flow conditions- In 2008 and 2009 MPCA collected continuous flow data during April to November at two mainstem sites on Ann River (Figure 3.1 of the TMDL). A continuous flow record from 2000-2010 was estimated using the regression relationship between the flows from Ann River to a long-term, continuous USGS gage downstream on the Snake River (R^2=0.75-0.79). The regression relationship was used to supplement the flow record at Ann River to include

estimates for the years 2000-2010, which represents various climate conditions (Section 3.3.2 of the TMDL).

b. Estimating E. coli loads- Kanabec and Mille Lacs SWCD monitored bacteria concentrations at six locations in the Ann River watershed from 2004-2009. Sampling locations provide good spatial representation of the mainstem and its tributaries (Table 3.2 of the TMDL). Fecal coliform data were collected in 2004-2006 and were converted to *E. coli* using a regression equation (R^2=0.69; Section 1.3.2 of the TMDL). The regression between fecal and *E.coli* can introduce uncertainty in the TMDL methods, however the degree of fit (i.e., R^2=0.69) is not uncommon between fecal coliform and *E. coli* due to the various coliforms that are part of the fecal group and the array of environmental factors that impact bacteria concentrations. Uncertainty that might result in the conversion of fecal to *E. coli* data is mitigated by the *E. coli* dataset from 2006-2009 (Section 3.3 of the TMDL).

c. Calculating E. coli loading capacity- MPCA used a load duration curve (LDC) to develop the *E. coli* TMDL. A flow duration curve (FDC) was first developed from the 2000-2010 flow record. Then flows were ranked into five categories based on how frequently a given flow is exceeded by the other flow values. The five flow categories and the corresponding percentile are: very high flow (0-10%), high (10-40%), mid-range (40-60%), low (60-90%), and dry flows (90-100%). Flow values in the 0-10% range are rarely exceeded, while flow measures in the 90-100% range are frequently exceeded. The FDC is then converted to an LDC by multiplying the target value, 126 cfu/100 ml for *E. coli*, by median flow values within the five flow zones in the FDC. Correction factors converted the target pollutant load into billion organisms per day, which gives discrete loading capacities for *E.coli*. MPCA plotted the *E. coli* data over the LDC to assess the reductions needed to attain water quality standards (Section 3.4 of the TMDL). MPCA calculated that *E. coli* exceed the water quality standard across all five flow zones, and the exceedence rate ranged from 33 to 88% of samples. To achieve the TMDL, reductions are needed in mid, low and dry flow zones. Percent reductions needed from current conditions were not reported, although Figure 3.5 in the TMDL illustrates the magnitude of needed reductions. (Section 3.3, Figure 3.1, Figure 3.5, and Table 3.2 of the TMDL)

d. Critical conditions- Critical conditions for *E. coli* are summer months and late fall when warm temperatures promote bacterial growth, and when livestock access to streams is greatest. The TMDL considers these critical conditions, as water quality data were recorded during these conditions, and a loading capacity is provided across multiple flow ranges based on datasets collected during these conditions (Section 3.3, 3.4, and 3.7 of the TMDL).

II. Ann and Fish Lake Total Phosphorus TMDLs- The TMDLs were determined in a multi-step process. First, loads from the watershed, internal loading, and atmospheric deposition were estimated using models and calculations. MPCA used well-known methods created by the Natural Resource Conservation Service (NRCS) to estimate runoff and loading, and used the Nürnberg model to estimate internal loads based on release rates from sediment core data collected in Ann and Fish Lakes. Previously developed deposition rates in the St. Croix basin were used to calculate atmospheric loads. Once the phosphorus sources were estimated MPCA modeled the in-lake response to those loads using the BATHTUB model. Next, the loading capacity was determined by iteratively adjusting incoming phosphorus loads using BATHTUB

until the model estimated incoming phosphorus loads that coincided with achieving water quality criteria. Finally, the allowable loads were distributed to sources and a margin of safety.

a. Modeling phosphorus loads- MPCA estimated loads from watershed runoff using the NRCS Curve Number and unit area load approach. The NRCS curve number estimates runoff for given soil properties and climate conditions. The curve number was developed for agricultural areas in the Midwestern states and thus can be expected to be applicable in the Ann River watershed. The curve number estimates runoff for specific areas within the watershed that are categorized into hydrologic response units (HRU). The HRUs are determined according to soils and land use data obtained from Soil Survey Geographic Group (SSURGO) and NASS 2009 land uses, respectively. Climate data were obtained from the City of Mora, approximately 1 mile northeast of Fish Lake. The watershed runoff and unit area load models estimated conditions well, based on a comparison of modeled and observed estimates for 2008 and 2009 (Section 4.1, Appendix D, and Appendix F of the TMDL).

Atmospheric phosphorus loads were estimated to be 186 and 100 lbs/year for Ann and Fish Lake, respectively. MPCA calculated the loads from deposition using the surface areas of Ann and Fish Lake and deposition rates of 0.22, 0.24, and 0.26 lb/ac/yr for dry, average, and wet years, respectively. The deposition rates were determined in a prior study for Minnesota's major basins and have been used in many Minnesota TMDLs (Section 4.5.4 of the TMDL).

MPCA estimated internal loads by using phosphorus release rates measured from lake sediment cores incubated under anoxic and oxic conditions. Lab procedures followed commonly accepted protocols (as cited in Appendix H and Appendix I of the TMDL). The mean release rates in each lake were above known averages for other comparable Minnesota lakes (Appendix H and Appendix I of the TMDL).

b. Modeling nutrient load response and load capacity- BATHTUB was used to model current in-lake phosphorus as a response to incoming loads (i.e., watershed, internal, atmospheric). BATHTUB estimates total phosphorus concentration using a mass-balance equation informed by lake size, residence time, sediment settling rates, and phosphorus loads to the lake. MPCA selected the Canfield-Bachmann mass-balance equation, which is based on data from Minnesota lakes, and is used to estimate the phosphorus concentrations in the lake. Using Canfield-Bachman improves the accuracy of BATHTUB results, as the Minnesota lake data are more relevant to Ann and Fish Lake compared to BATHTUB default datasets. BATHTUB predicted phosphorus approximately 13% below observed concentrations in Fish Lake, but predictions matched observations for Ann Lake (Section 4.5.5 and Appendix J of the TMDL).

The loading capacity was calculated by adjusting incoming loads in BATHTUB. For this exercise, the septic loads were reduced to zero as they are not permissible, atmospheric loads were held consistent with current conditions, and the remaining loads (watershed drainage, upstream waters, and internal loading) were adjusted until the total phosphorus target was achieved. The resulting load capacities for Ann and Fish Lake were 7,689 and 8,047, respectively (Section 4.7.1 and Appendix J of the TMDL).

c. Critical conditions- MPCA determined that critical conditions occur in the growing season (mid-May to September) where reduced inflow and increased residence times cause stagnation,

nutrient accumulation, and internal loading. Algal growth increases along with nutrient loads, which can lead to anoxic conditions in the hypolimnion and a release of phosphorus from bottom sediments. The critical conditions were implicitly accounted for because in-lake water quality data were taken bi-weekly during the growing season in 2008 and 2009. In addition, the flow record includes a range of high to low flows, which impact nutrient response during the growing season. Thus through targeted data analysis and a wide ranging flow record, MPCA set allocations that account for growing season critical conditions (Section 3.3.2, Section 4.2.1, and Section 4.7 of the TMDL).

III. Ann River Biota (embedded sediment) TMDL- The sediment TMDLs were determined by identifying current sediment loads from the watershed and streambank erosion using results from Kanabec County SWCD's stressor identification, streambank data from Ann River, and common empirical calculations. The loading capacity was set by identifying a rate of streambank erosion that could occur and support a healthy stream. Allocations were then assigned to sediment sources.

a. Estimating current sediment loads- MPCA estimated sediment loads from watershed soil loss and streambank erosion. Sediment load from the watershed was estimated at 763 tons per year from the 12,116 acre drainage area to Ann River. The estimate was determined by the universal soil loss equation (USLE), as a function of slope, watershed size, and soil properties. The USLE approach accounts for the main factors affecting erosion and was developed for use in agricultural areas, and thus can reasonably be applied to the Ann River watershed (Section 5.2.1 of the TMDL).

Sediment load from streambank erosion was estimated at 1,317 tons per year from the entire stream corridor. Streambank loads were calculated using the NRCS direct volume method (i.e., the Wisconsin method) and field data collected by both Mille Lacs and Kanabec SWCD at five locations in Ann River (Figure 5.1 of the TMDL). This approach measures soil loss as a function of eroding area, lateral recession rate, and soil density (Table 5.4, Table 5.6, and Section 5.2.2 of the TMDL).

*b. Calculating sediment loading capacity-*The loading capacity was determined as the soil loads that could be delivered to the stream and still support a stable, healthy stream in a watershed with some agricultural land uses. Expected sediment loss in similar streams ranges from 0.01 to 0.05 feet of soil loss per year, where 0.01 occurs in a pristine watershed with no changes to land use, and 0.05 occurs in a stable watershed with some land use disturbance. Current estimated rates of soil loss ranged from 0.03 to 0.50 feet per year, with an average loss of 0.07 feet per year. MPCA developed the load capacity such that loss rates would not exceed 0.025 feet per year; this value represents a stream in good condition (Section 5.3.2 of the TMDL). Soil loss from streambank erosion must be reduced by 865 tons on an annual basis to meet the TMDL, which is approximately a 69% reduction from current conditions.

*c. Critical conditions-*MPCA stated that critical conditions for streambank erosion are periods of high flows caused by spring snowmelt and large storm events. These conditions cause erosion and mass wasting, which deliver large sediment loads that become embedded in the substrates. Recession rates per year are a cumulative measure of streambank erosion due to both critical and non-critical conditions. MPCA used recession rates that have been observed in healthy streams in order to estimate the loading capacity. Thus the allocations implicitly account for critical conditions that impact sediment delivery to the stream (Section 5.3.5 of the TMDL).

The EPA finds that the TMDL document submitted by the MPCA satisfies the requirements of the third criterion.

4. Load Allocations (LAs)

EPA regulations require that a TMDL include LAs, which identify the portion of the loading capacity attributed to existing and future nonpoint sources and to natural background. Load allocations may range from reasonably accurate estimates to gross allotments (40 C.F.R.§130.2(g)). Where possible, load allocations should be described separately for natural background and nonpoint sources.

Comment:
A. Ann River *E. coli* TMDL: *E. coli* load allocations are in Table 3 in this decision document. MPCA found no permitted point source discharges to Ann River. Thus the load allocation was calculated as the loading capacity minus the MOS and is applicable to all non-point sources of *E. coli* in the Ann River watershed. The load allocation applies to outflow from upstream lakes, wetlands, agricultural runoff, forested land, non-regulated MS4 residential areas, bank erosion, failing and 'straight-pipe' septic systems, and livestock (Table 3.4, Table 3.5, Figure 3.5, Section 3.4.4, and Section 3.7.2 of the TMDL).

B. Ann and Fish Lake Total Phosphorus TMDLs: Phosphorus load allocations are in Tables 4 and 5 in this decision document. The load allocation was calculated as the loading capacity minus WLA (for Fish Lake only) and a 5% explicit MOS. The load allocation applies to all nonpoint sources of phosphorus to the lakes. The allocation to atmospheric loads was set equal to current conditions. Ann Lake internal load allocations were based on phosphorus release rates expected for mesotrophic lakes, whereas the allocations to internal load at Fish Lake is based on a release rate expected for small-sized, polymictic lakes (i.e., water column frequently mixes) that do not have prolonged anoxic periods (Section 4.7.2 of the TMDL). A zero allocation was given to septic loads, and the remaining reductions were assigned to drainage areas, upstream lakes, and wetlands (i.e., West Ann Lake) (Section 4.7.4 of the TMDL).

C. Ann River Biota (embedded sediment) TMDL: Sediment load allocations are in Table 6 in this decision document. Erosion from streambanks along Ann River delivered two times more sediment to the stream compared to loads from the 12,116 acre watershed, thus reductions were assigned for streambank erosion while watershed loads were held constant. The most probable causes of streambank erosion are linked to activity near the streambanks (e.g., livestock access to streams). Sediment from streambank erosion would need to be reduced by 69% of the current estimate to achieve the TMDL (Section 5.2 and 5.3 of the TMDL).

The EPA finds that the TMDL document submitted by the MPCA satisfies the requirements of the fourth criterion.

5. Wasteload Allocations (WLAs)

EPA regulations require that a TMDL include WLAs, which identify the portion of the loading capacity allocated to individual existing and future point source(s) (40 C.F.R. §130.2(h), 40 C.F.R. §130.2(i)). In some cases, WLAs may cover more than one discharger, e.g., if the source is contained within a general permit.

The individual WLAs may take the form of uniform percentage reductions or individual mass based limitations for dischargers where it can be shown that this solution meets WQSs and does not result in localized impairments. These individual WLAs may be adjusted during the NPDES permitting process. If the WLAs are adjusted, the individual effluent limits for each permit issued to a discharger on the impaired water must be consistent with the assumptions and requirements of the adjusted WLAs in the TMDL. If the WLAs are not adjusted, effluent limits contained in the permit must be consistent with the individual WLAs specified in the TMDL. If a draft permit provides for a higher load for a discharger than the corresponding individual WLA in the TMDL, the State/Tribe must demonstrate that the total WLA in the TMDL will be achieved through reductions in the remaining individual WLAs and that localized impairments will not result. All permittees should be notified of any deviations from the initial individual WLAs contained in the TMDL. EPA does not require the establishment of a new TMDL to reflect these revised allocations as long as the total WLA, as expressed in the TMDL, remains the same or decreases, and there is no reallocation between the total WLA and the total LA.

Comment: MPCA identified two general industrial stormwater sources in the Fish Lake subwatershed. MPCA did not identify other permitted point source discharges to Ann Lake, Ann River, or Fish Lake. For the *E. coli* WLA, MPCA assumed that industrial and construction general permitted discharges were not a source of *E. coli* and a 0 WLA applies to these permitted discharges (Section 3.4.3. of the TMDL). Total phosphorus WLA is equal to 1.5% of the loading capacity for Ann and Fish Lakes minus the MOS. The allocation includes reserve capacity for future sources of general permitted sources of construction and industrial stormwater (Section 4.7.2.1 and Section 4.7.7 of the TMDL). For the embedded sediment TMDL, a WLA equal to 0.1% of the loading capacity was assigned to general construction and industrial stormwater given that there are no current sources of this discharge.

Table 7. Wasteload Allocations in the Ann River Watershed (Table 3.4,, 4.9, 4.10, and 5.9 of the TMDL).

Point source	E. coli (billion orgs/day)	Total Phosphorus (lbs/day)	Embedded sediment (tons/day)
General stormwater: Construction (MNR100001) Industrial (MNR50000)	0	0.3	<0.1
MS4 (no existing MS4s)	0	0	0
CAFO	0	0	0

The EPA finds that the TMDL document submitted by the MPCA satisfies the requirements of the fifth criterion.

6. Margin of Safety (MOS)

The statute and regulations require that a TMDL include a margin of safety (MOS) 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's 1991 TMDL Guidance explains that the MOS may be implicit, i.e., incorporated into the TMDL through conservative assumptions in the analysis, or explicit, i.e., expressed in the TMDL as loadings set aside for the MOS. If the MOS is implicit, the conservative assumptions in the analysis that account for the MOS must be described. If the MOS is explicit, the loading set aside for the MOS must be identified.

Comment:

A. Ann River *E. coli* TMDL: An explicit margin of safety was set equal to 5% of the total loading capacity in each flow zone and ranged from 0.8 to 31.9 billion organisms per day (Table 3.4 of the TMDL). MPCA believes that 5% explicit MOS is sufficient to account for sources of uncertainty, given that the LDC approach assigns loads for five different flow categories. The categories account for much of the variation in flow and water quality conditions, which could otherwise create uncertainty if a single allocation was applied across all flows (Section 3.4.2 of the TMDL).

B. Ann and Fish Lake Total Phosphorus TMDL: A 5% explicit MOS was established for Ann Lake, and a 10% explicit MOS was established for Fish Lake. The explicit MOS' were assigned to account for uncertainty in the modeled runoff and water quality response estimates. A larger MOS was given to Fish Lake because the BATHTUB model predicted in-lake concentrations approximately 13% below observed concentrations (Section 4.7.3 and Appendix J of the TMDL). Uncertainty in BATHTUB model predictions are mitigated in part by use of the Canfield-Bachmann equations that were informed by a dataset specifically from Minnesota lakes.

C. Ann River Biota (embedded sediment) TMDL: A 10% explicit margin of safety was established for Ann River to account for uncertainty in the estimates. Sources of uncertainty include: extrapolation of the field survey data through the entire stream corridor, the accuracy of lateral recession rates, and the selection of the target. These sources of uncertainty were mitigated by examining aerial photos as well as field data, and by selecting a target below the highest soil loss rate that would still produce stable stream conditions (Section 5.3 of the TMDL).

The EPA finds that the TMDL document submitted by the MPCA satisfies the requirements of the sixth criterion.

7. Seasonal Variation

The statute and regulations require that a TMDL be established with consideration of seasonal variations. The TMDL must describe the method chosen for including seasonal variations (CWA §303(d)(1)(C), 40 C.F.R. §130.7(c)(1)).

Comment: Seasonal variation is accounted for in each of the TMDLs because the datasets and modeling approaches captured a wide range of conditions within a season, and across multiple years.

A. Ann River *E. coli* TMDL: Bacteria data can be highly variable and are influenced by climatic factors and in-stream processes, which vary on both short and long-term time scales. Bacteria datasets were collected from 2004-2010 and the flow record was observed and simulated for the 2000-2010 period. Figure 3.5 of the TMDL shows that bacteria and flow data varied by a range of three to four orders of magnitude. The bacteria TMDL implicitly accounts for some of this variation because the LDC approach generates allocations for a range of flows (Figure 3.5, Figure 3.6, and Section 3.7.2 of the TMDL).

B. Ann and Fish Lake Total Phosphorus TMDL: Phosphorus loads vary by season due to climate and in-lake processes. For example, in a dry year with little precipitation, residence time can increase, which causes nutrients to accumulate and stratification to intensify. These conditions support anoxia and subsequent internal loading from bottom sediments. By contrast, in a wet year, larger watershed loads may occur, but nutrient retention will be lower in shallow lakes due to greater inflow volumes that decrease the residence time. MPCA accounted for variation in the TMDLs by using a flow record from 2000-2010 that captured various hydrologic conditions. Furthermore, a wide range of mean annual in-lake phosphorus was observed in both lakes, and both lakes were sampled during both stratified and non-stratified conditions. Thus the allocations reflect seasonal variation in loading and water quality response (Appendix B and Appendix C of the TMDL).

C. Ann River Biota (embedded sediment) TMDL: Sediment loads can vary due to climate. Sediment loads from streambank erosion and runoff are commonly the result of storm events, but the load from each event can vary. The analysis of lateral recession rates and streambed particle sizes collected in the field accounts for soil loss that occurred in Ann River. MPCA's use of site-specific information in current load estimates accounts for seasonal variation of sediment loads (Section 5.2 and Section 53.5 of the TMDL).

The EPA finds that the TMDL document submitted by the MPCA satisfies the requirements of the seventh criterion.

8. Reasonable Assurances

When a TMDL is developed for waters impaired by point sources only, the issuance of a NPDES permit(s) provides the reasonable assurance that the wasteload allocations contained in the TMDL will be achieved. This is because 40 C.F.R. 122.44(d)(1)(vii)(B) requires that effluent limits in permits be consistent with "the assumptions and requirements of any available wasteload allocation" in an approved TMDL.

When a TMDL is developed for waters impaired by both point and nonpoint sources, and the WLA is based on an assumption that nonpoint source load reductions will occur, EPA's 1991 TMDL Guidance states that the TMDL should provide reasonable assurances that nonpoint

source control measures will achieve expected load reductions in order for the TMDL to be approvable. This information is necessary for EPA to determine that the TMDL, including the load and wasteload allocations, has been established at a level necessary to implement water quality standards.

EPA's August 1997 TMDL Guidance also directs Regions to work with States to achieve TMDL load allocations in waters impaired only by nonpoint sources. However, EPA cannot disapprove a TMDL for nonpoint source-only impaired waters, which do not have a demonstration of reasonable assurance that LAs will be achieved, because such a showing is not required by current regulations.

Comment:

A. Point Sources: Reasonable assurance that WLAs will be implemented is provided by regulatory actions. According to 40 CFR 122.44(d)(1)(vii)(B), NPDES permit effluent limits must be consistent with assumptions and requirements of all WLAs in an approved TMDL. MPCA implements its storm water and NPDES permit programs, and is responsible for making the effluent limits consistent with the WLAs in this TMDL. Sediment and *E. coli* WLAs were assigned in this TMDL for general construction and industrial stormwater sources. The general permit for construction requires that BMPs are properly selected, installed, and maintained.

B. Nonpoint Sources: Given that an implementation plan is expected to be complete within a year of the TMDL approval, and that implementation agencies have been involved in the TMDL process, there is reasonable assurance BMPs will be implemented to reduce pollutant loads. MPCA states that Mille Lacs and Kanabec SWCD and Kanabec County Environmental Services will coordinate implementation, and that actions will be incorporated into Kanabec County's local water plan. Local lake associations and the Snake River Watershed Management Board were also involved in the TMDL process. These agencies have experience implementing actions recommended to achieve the TMDL. Specifically, the SWCD agencies have implemented practices to reduce sediment and erosion, assisted landowners to install BMPs in fields and near streams, and have funded past cost-share opportunities, which demonstrates the capacity to fund future implementation. Other possible funding could include: the Conservation Reserve Program, 319 funds, and local cost-share grants (Section 7.2, 7.3, and 7.6 of the TMDL). MPCA notes that management actions to reduce internal loading have advanced and cite recent experience with achieving reductions through alum treatments at Half Moon Lake, MN (Administrative Record No. 10-8).

Minnesota Feedlot rules (MR 7020) provide reasonable assurance that *E. coli* reductions will be achieved. The rules generally require manure management plans from feedlots with more than 300 units and without a specified manure applicator. MPCA estimated that manure spreading comprised approximately 16% of available fecal coliform to the stream (Section 7.2 of the TMDL).

Minnesota's septic systems are regulated by Minnesota Statutes in Chapter 7080 and 7081. The statutes detail minimum technical standards for septic systems and outline a framework for local administration of septic systems. Kanabec and Mille Lac Counties have a septic system ordinance detailing that septic systems should be inspected when there is a property transfer, and new installation or replacement of a septic system. Kanabec County has demonstrated five years of

success implementing Clean Water Partnership Funds to replace failing and non-compliant septic systems (Section 7.2 of the TMDL).

C. Clean Water Legacy Act (CWLA): The CWLA is a statute passed in Minnesota in 2006 for the purposes of protecting, restoring, and preserving Minnesota water. The CWLA provides the process to be used in Minnesota to develop TMDL implementation plans, which detail the restoration activities needed to achieve the allocations in the TMDL. The TMDL implementation plans are required by the State to obtain funding from the Clean Water Fund. The Act discusses how MPCA and the involved public agencies and private entities will coordinate efforts regarding land use, land management, water management, etc. Cooperation is also expected between agencies and other entities regarding planning efforts, and various local authorities and responsibilities. This would also include informal and formal agreements to jointly use technical, educational, and financial resources. MPCA expects the implementation plans to be developed within a year of TMDL approval.

The CWLA also provides details on public and stakeholder participation, and how the funding will be used. The implementation plans are required to contain ranges of cost estimates for point and nonpoint source load reductions, as well as monitoring efforts to determine effectiveness. MPCA has developed guidance on what is required in the implementation plans (Implementation Plan Review Combined Checklist and Comment, MPCA), which includes cost estimates, general timelines for implementation, and interim milestones and measures. The Minnesota Board of Soil and Water Resources administers the Clean Water Fund and has developed a detailed grants policy explaining what is required to be eligible to receive Clean Water Fund money (Minnesota Board of Soil and Water Resources, 2011).

The EPA finds that this criterion has been adequately addressed.

9. Monitoring Plan to Track TMDL Effectiveness

EPA's 1991 document, *Guidance for Water Quality-Based Decisions: The TMDL Process* (EPA 440/4-91-001), recommends a monitoring plan to track the effectiveness of a TMDL, particularly when a TMDL involves both point and nonpoint sources, and the WLA is based on an assumption that nonpoint source load reductions will occur. Such a TMDL should provide assurances that nonpoint source controls will achieve expected load reductions and, such TMDL should include a monitoring plan that assess if load reductions provided for in the TMDL are occurring and leading to attainment of water quality standards.

Comment: In order to track effectiveness of the TMDL, MPCA would be able to compare approximately 10 years of historical data used to develop the TMDL to data that is scheduled to be collected in 2017 as part of MPCA's intensive watershed monitoring program. This program calls for major watersheds to be re-assessed on a revolving cycle. In addition, MPCA states that changes to water quality will be regularly monitored by SWCD's as funding is available (Section 8.0 of the TMDL).

MPCA identifies water quality, bacteria, and biota parameters that should be measured and

suggests an appropriate sampling frequency for some protocols (e.g., fish survey). Agencies that have conducted monitoring data in the past and will attempt to monitor conditions where possible includes: MPCA, Minnesota Department of Natural Resources (MDNR), and Snake River Watershed Management Board (Section 8.0 of the TMDL).

The EPA finds that this criterion has been adequately addressed.

10. Implementation

EPA policy encourages Regions to work in partnership with States/Tribes to achieve nonpoint source load allocations established for 303(d)-listed waters impaired by nonpoint sources. Regions may assist States/Tribes in developing implementation plans that include reasonable assurances that nonpoint source LAs established in TMDLs for waters impaired solely or primarily by nonpoint sources will in fact be achieved. In addition, EPA policy recognizes that other relevant watershed management processes may be used in the TMDL process. EPA is not required to and does not approve TMDL implementation plans.

Comment: In accordance with MPCA policy, an implementation plan will be completed within one year of TMDL approval. Agencies that will coordinate and conduct implementation include: Kanabec County Environmental Services, Mille Lacs and Kanabec SWCD, MPCA, and MDNR. MPCA identified actions to reduce pollutant loads and address nutrient, bacteria, and sediment causes of impairment. MPCA estimated the total costs to address nutrient and *E. coli* impairments at $300,000 to $500,000. Example practices recommended by MPCA include hypolimnetic withdrawal, alum treatment, pasture and manure management, installation of stream buffers, septic system upgrades, and implementing stormwater regulations. The estimated reductions required from internal loading are 75% and 82% for Ann and Fish Lakes, respectively. MPCA acknowledged that internal load reductions are an important component to achieve the total phosphorus TMDLs and suggested that management of this source go under a specific technical review before any actions are implemented (Section 6.2.1 through 6.2.5 of the TMDL).

To address the biotic impairments, MPCA identified stream restoration practices that should be implemented. Recommended improvements were given for all six reaches within the Ann River (Table 6.1 in the TMDL). These practices include in-stream habitat restoration, livestock fencing, and stream buffers and natural stream stabilization. MPCA cited strategies that would reduce erosion of stream banks and restore natural gradients in the stream which would reduce in –stream sediment accumulation. The total costs to implement stream restoration practices identified for Ann River were estimated at $850,000 (Section 6.31 through 6.3.4 of the TMDL).

The EPA finds that this criterion has been adequately addressed.

11. Public Participation

EPA policy is that there should be full and meaningful public participation in the TMDL development process. The TMDL regulations require that each State/Tribe must subject

calculations to establish TMDLs to public review consistent with its own continuing planning process (40 C.F.R. §130.7(c)(l)(ii)). In guidance, EPA has explained that final TMDLs submitted to EPA for review and approval should describe the State's/Tribe's public participation process, including a summary of significant comments and the State's/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)).

Provision of inadequate public participation may be a basis for disapproving a TMDL. If EPA determines that a State/Tribe has not provided adequate public participation, EPA may defer its approval action until adequate public participation has been provided for, either by the State/Tribe or by EPA.

Comment: Public participation occurred during TMDL development through a technical advisory committee (TAC) comprised of county and SWCD representatives. The TAC members had opportunity to comment on draft TMDLs and were invited to six meetings on the TMDL between November 2007 and March of 2012 (Section 9.1 of the TMDL).

The TMDL was on public notice from January 14, 2013 to February 13, 2013. The public comment period was announced in an MPCA news release and published in the Minnesota State Register on January 14, 2013. Electronic copies of the draft TMDL were published on the MPCA website along with a notification of the public comment period (Administrative Record No. 10).

MPCA received written comments from Midwest Center for Environmental Advocacy (MCEA) expressing concern on overreliance on internal load reductions, margin of safety, monitoring, and reasonable assurance. MPCA responded to MCEA in a written letter dated April 16, 2013 and made adjustments to the TMDL to clarify or discuss MPCA's rationale on issues related to MCEA's concerns (Administrative Record No. 10-8).

The EPA finds that the TMDL document submitted by the MPCA satisfies the requirements of this eleventh element.

12. Submittal Letter

A submittal letter should be included with the TMDL submittal, and should specify whether the TMDL is being submitted for a *technical review* or *final review and approval.* 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 Section 303(d) of the Clean Water Act for EPA review and approval. This clearly establishes the State's/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 review and approval, should contain such identifying information as the name and location of the waterbody, and the pollutant(s) of concern.

Comment: On May 8, 2013, EPA received a submittal letter dated April 22, 2013 signed by Rebecca J. Flood, MPCA Assistant Commissioner, addressed to Tinka Hyde, EPA Region 5, Water Division Director. The submittal letter identified the names of the waterbodies for

which the TMDLs were developed. The locations of the waterbodies were provided in the supporting documentation. The letter explicitly states that the Ann River Watershed TMDL was submitted for final approval by EPA under Section 303(d) of the Clean Water Act.

The EPA finds that the TMDL document submitted by the MPCA satisfies the requirements of this twelfth element.

13. Conclusion

After a full and complete review, the EPA finds that the TMDLs for Ann River Watershed for *E. coli*, excess nutrients (total phosphorus), and sediment meet all of the required elements of an approvable TMDL. This decision document addresses one (1) total phosphorus TMDL for Ann Lake (33-0040-00), one (1) total phosphorus TMDL for Fish Lake (33-0036-00), one (1) *E. coli* TMDL for Ann River (07030004-511), and one (1) TMDL for sediment to address biotic (fish and invertebrate) impairments as identified on Minnesota's 2010 303(d) list.

EPA's approval of this TMDL does not extend to waters within Indian Country, as defined in 18 U.S.C. Section 1151. EPA is taking no action to approve or disapprove TMDLs for those waters at this time. EPA, or eligible Indian Tribes, as appropriate, will retain responsibilities under the CWA Section 303(d) for those waters.