



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

REPLY TO THE ATTENTION OF:
W-15J

February 4, 2022

Glenn Skuta, Watershed Division Director
Minnesota Pollution Control Agency
520 Lafayette Road North
St. Paul, Minnesota 55155-4194

Dear Mr. Skuta:

The U.S. Environmental Protection Agency completed its review of the final Total Maximum Daily Loads (TMDL) for Myrtle Lake/Vermilion River, including supporting documentation. Myrtle Lake is located in northern Minnesota. The Myrtle Lake TMDL was calculated for phosphorus to address the impaired aquatic recreation use.

The Myrtle Lake TMDL meets the requirements of Section 303(d) of the Clean Water Act and EPA's implementing regulations set forth at 40 C.F.R. Part 130. Therefore, EPA approves Minnesota's one (1) phosphorus TMDL. EPA describes Minnesota's compliance with the statutory and regulatory requirements in the enclosed decision document.

EPA acknowledges Minnesota's efforts in submitting this TMDL and look forward to future submissions by the State of Minnesota. If you have any questions, please contact Mr. David Werbach of the Watersheds and Wetlands Branch at werbach.david@epa.gov or 312-886-4242.

Sincerely,

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Date: 2022.02.04
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Tera L. Fong
Division Director, Water Division

Cc: Amy Mustonen, MPCA

wq-iw10-17g

DECISION DOCUMENT FOR THE MYRTLE LAKE/VERMILION RIVER TMDL, MINNESOTA

Section 303(d) of the Clean Water Act (CWA) and EPA’s implementing regulations at 40 C.F.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 Water body, Pollutant of Concern, Pollutant Sources, and Priority Ranking

The TMDL submittal should identify the water body as it appears on the State’s/Tribe’s 303(d) list. The water body 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 water body 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 water body. 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 water body 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* and phosphorus loadings for excess algae; length of riparian buffer; or number of acres of best management practices.

Comment:

Location Description/Spatial Extent:

Myrtle Lake is located in northern Minnesota, within the Vermilion River watershed (Section 1.1 of the final TMDL document). The lake drains a small watershed, approximately 8,000 acres, and the Minnesota Pollution Control Agency (MPCA) notes that four small tributaries flow into the lake (Section 3.1 of the final TMDL document). The lake drains into the Pelican River via a small (3/4 mile tributary) river known locally as the Myrtle River. During certain portions of the year, the State noted that the Myrtle River becomes much like a wetland. Much of the shoreline remains natural and the lake is host to a diverse aquatic plant and fish community.

The lake has a surface area of 876 acres, a mean depth of 10 feet, and a maximum depth of 20 feet. The watershed area for the lake is approximately 8,000 acres, including the lake (Table 6 and Figure 3 of the final TMDL document). Table 1 of this Decision Document contains the listing information for Myrtle Lake.

Table 1: Listing information for Myrtle Lake

Name	ID	Pollutant/Stressor	Impaired Use	Year First Listed	TMDL Pollutant
Myrtle Lake	69-0749-00	Nutrients/Eutrophication biological indicators	Aquatic Recreation	2018	Phosphorus

Land Use:

MPCA describes the Myrtle Lake land use in Section 3.3 of the final TMDL document. The land use is predominately forest land (Table 7 of the final TMDL document; Table 2 of this Decision Document). MPCA explained that some development has occurred along the southern shore; mainly privately owned cabins and a small resort. MPCA also noted that some gravel mining and logging have occurred in the watershed (Section 3.0 of the final TMDL document).

Table 2: Land use summary for the Myrtle Lake phosphorus TMDL

Name	ID	Drainage Area (Acres)	Wetlands (acres)	Open water (acres)	Forest (acres)	Hay and pasture (acres)	Developed (acres)
Myrtle Lake	69-0749-00	8,016	893	907	5,825	72	319
Approximate Percent of total Myrtle Lake watershed area			11%	11%	73%	1%	4%

Problem Identification:

Myrtle Lake was identified as having an impaired Aquatic Recreation Use due to high concentrations of phosphorus and chlorophyll-*a* (chl-*a*) and low Secchi disk transparency depths (Section 2 of the final TMDL document).

MPCA explained that Myrtle Lake is a shallow, bog-stained (i.e., high dissolved organic carbon) lake that has experienced algal blooms for many years. MPCA water quality data from 2015, 2016, and 2018 indicate exceedances of the lake criteria for Myrtle Lake (Table 8 and Figures 7-8 of the final TMDL document). MPCA noted that the 2018 water quality data indicated that water quality decreased later in the growing season, particularly from mid-July to mid-August.

To further assess the impacts on the lake, MPCA performed a paleolimnological study of the lake sediments (Section 3.4 of the final TMDL document). This study indicated that sedimentation rates in the lake had increased after historical logging began in the watershed. The study also noted that phosphorus rates have remained relatively consistent over the last 200 years, but that cyanobacteria types have changed since 1940. The study also noted that the lake is generally mixed, but that short-term stratification can contribute phosphorus loading to the lake via internal loading.

Priority Ranking:

MPCA's schedule for TMDL completions, as indicated on the 303(d) impaired waters list, reflects Minnesota's priority ranking of this TMDL. MPCA has aligned its TMDL completion schedule with its watershed approach and its Watershed Restoration and Protection Strategy (WRAPS) 10-year cycle. Mainstem river TMDLs, which are not contained in major watersheds and thus not addressed in WRAPS, must also be completed. The MPCA developed a state plan, Minnesota's TMDL Priority Framework Report, to meet the needs of EPA's national measure (WQ-27) under EPA's Long-Term Vision for Assessment, Restoration and Protection under the CWA section 303(d) program. As part of these efforts, the MPCA identified water quality-impaired segments that will be addressed by TMDLs by 2022. Myrtle Lake, addressed by this TMDL, is part of the MPCA prioritization plan to meet EPA's national measure.

Pollutant of Concern:

The pollutant of concern is phosphorus.

Myrtle Lake was included on the final 2020 Minnesota 303(d) list due to excessive nutrients as indicated by total phosphorus levels. While phosphorus is an essential nutrient for aquatic life, elevated concentrations of phosphorus can lead to nuisance algal blooms that negatively impact aquatic life and recreation (e.g., swimming, boating, fishing, etc.). Algal decomposition can deplete dissolved oxygen levels within the water column and can stress benthic macroinvertebrates and fish. Depletion of oxygen in the water column can also lead to conditions where phosphorus is released from bottom sediments (i.e., internal loading). Also, excess algae can shade the water column which can limit the distribution of aquatic vegetation. Aquatic vegetation stabilizes bottom sediments, and also is an important habitat for macroinvertebrates and fish.

Source Identification (point and nonpoint sources):

Point Source Identification: MPCA determined that there are no significant point sources in the Myrtle Lake watershed.

Permitted Construction and Industrial Stormwater:

MPCA determined that a portion of the Myrtle Lake watershed may include lands addressed under construction stormwater permits (Section 4.1.2 of the final TMDL document). MPCA reviewed local records and determined that the approximate annual percentage of land area under construction has been 0.08% in the Vermilion River Watershed. Additionally, MPCA set aside an allocation for industrial stormwater dischargers that is equal to the allocation for construction stormwater in the watershed (0.08%). Section 5 of this Decision Document further discusses the wasteload allocation (WLA) for stormwater in the Myrtle Lake phosphorus TMDL. Construction and industrial sites may contribute pollutants via runoff during stormwater events. These areas within the Myrtle Lake must comply with the requirements of the MPCA's NPDES Stormwater Program and create a Stormwater Pollution Prevention Plan (SWPPP) that summarizes how stormwater will be minimized from the site.

Nonpoint Source Identification: The potential nonpoint sources to the Myrtle Lake are:

Overland Runoff: Runoff from developed areas (i.e., residential or industrial land uses) can contribute phosphorus to local waterbodies. While there is limited developed area in the watershed, MPCA noted that the development is concentrated along the south shore of the lake, and any runoff may have a more direct effect on the water quality.

MPCA also investigated the role that wetlands are playing in phosphorus contributions. MPCA noted that sampling data in one of the tributaries that drains a significant amount of wetlands had higher phosphorus results than other tributaries. MPCA also noted that the water quality data are limited, and that it will continue to gather additional water quality data to determine the impacts of wetlands on water quality. (Section 3.5.1.2 of the final TMDL document).

Discharges from Septic Systems: MPCA determined that failing subsurface sewage treatment systems (septic systems or SSTS) are a potential source of nutrients within the Myrtle Lake watershed. SSTS generally do not discharge directly into a water body, but effluents from SSTS may leach into groundwater or pond at the surface where they can be washed into surface waters via stormwater runoff events. Age, construction and use of SSTS can vary throughout a watershed and influence the nutrient contribution from these systems.

Internal loading: The release of phosphorus from lake sediments, via physical disturbance from benthic fish and wind mixing the water column, may contribute internal phosphorus loading to Myrtle Lake. Phosphorus may build up in the bottom waters of the lake and may be resuspended or mixed into the water column when the thermocline decreases and water in the lake mixes.

As discussed above, MPCA reviewed a study of lake sediment cores in Myrtle Lake to investigate the role of internal loading in the lake (Section 3.4 of the final TMDL document). Results showed that internal loading was a significant contributor at certain times of the year (Figure 11 of the final TMDL document).

Atmospheric deposition: Phosphorus and organic material may be added via particulate deposition. Particles from the atmosphere may fall onto lake surfaces or other surfaces within the Myrtle Lake watershed. Phosphorus can be bound to these particles which may add to the phosphorus inputs to surface water environments.

Future Growth:

MPCA did not calculate a reserve capacity of the TMDLs. Any expansion of point or nonpoint sources will need to comply with the respective WLA and load allocation (LA) values calculated in the Myrtle Lake phosphorus TMDL.

The EPA finds that the TMDL document submitted by 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 water body, the applicable numeric or narrative water quality criterion, and the antidegradation policy (40 C.F.R. § 130.7(c)(1)). 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:

Designated Uses:

Water quality standards (WQS) are the fundamental benchmarks by which the quality of surface waters are measured. Within the State of Minnesota, WQS are developed pursuant to the Minnesota Statutes Chapter 115, Sections 03 and 44. Authority to adopt rules, regulations, and standards as are necessary and feasible to protect the environment and health of the citizens of the State is vested with the MPCA. Through adoption of WQS into Minnesota's administrative rules (principally Chapters 7050 and 7052), MPCA has identified designated uses to be protected in each of its drainage basins and the criteria necessary to protect these uses.

Minnesota Rule Chapter 7050 designates uses for waters of the state. Myrtle Lake is designated as Class 2B and 3C water, with Class 2B being the most restrictive for the pollutant being addressed by the TMDL (Section 2.4 of the final TMDL document). The Class 2 designated use is described in Minnesota Rule 7050.0140 (3):

“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.”

Standards:

Narrative Criteria:

Minnesota Rule 7050.0150 (3) set forth 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.”

Numeric criteria:

In Section 2 of the final TMDL document, MPCA describes the applicable numeric water quality standards (Table 4 of the final TMDL document and Table 3 of this Decision Document). Myrtle Lake is located in the Northern Lakes and Forest Ecoregion (Section 2.4 of the final TMDL document).

MPCA selected phosphorus as the appropriate target parameter to address eutrophication problems because of the interrelationships between phosphorus and chl-*a*, and phosphorus and Secchi Depth (SD). Algal abundance is measured by chl-*a*, which is a pigment found in algal cells. As more phosphorus becomes available, algae growth can increase. Increased algae in the water column will decrease water clarity that is measured by SD depth. These criteria apply from June 1-September 30.

In developing the lake nutrient standards for Minnesota lakes, MPCA evaluated data from a large cross-section of lakes within each of the State’s ecoregions. Clear relationships were established between the causal factor, phosphorus, and the response variables, chl-*a* and SD depth. MPCA anticipates that by meeting the phosphorus concentration the response variables chl-*a* and SD will be attained and the Myrtle Lake phosphorus TMDL will achieve the designated beneficial uses. For a lake to achieve its’ designated beneficial use, the lake must not exhibit signs of eutrophication and must allow water-related recreation, fishing and aesthetic enjoyment. MPCA views the control of eutrophication as the lake enduring minimal nuisance algal blooms and exhibiting desirable water clarity.

Table 3: Lake Criteria for the Myrtle Lake phosphorus TMDL

Name	Lake Type	Total Phosphorus (µg/L)	Chlorophyll-a (µg/L)	Secchi Transparency (meters)
Myrtle Lake	Shallow	≤ 30	≤ 9	≥ 2.0

Target: MPCA employed the phosphorus criteria of **30 µg/L** measured as a summer average as noted in Table 3 of this Decision Document and Table 4 of the final TMDL document. As discussed further in Section 3 of this Decision Document, the phosphorus loads were reduced to determine the attainment of the chl-*a* criteria or the other eutrophication criteria as required.

The EPA finds that the TMDL document submitted by 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 water body 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 stream flow, loading, and water quality parameters as part of the analysis of loading capacity (40 C.F.R. §130.7(c)(1)). 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:

The phosphorus TMDL developed for Myrtle Lake was calculated using the U.S. Army Corps of Engineers (USACE) BATHTUB Model (Section 4.1.1 and Appendix A of the final TMDL document; Table 4 of this Decision Document). The BATHTUB model was used to calculate loading capacities for the lake and to link observed phosphorus water quality conditions and

estimate phosphorus loads to determine in-lake water quality. MPCA has previously employed BATHTUB successfully in many lake studies in Minnesota. BATHTUB is a steady-state annual or seasonal model that predicts a lake’s growing season (June 1 to September 30) average surface water quality. BATHTUB utilizes annual or seasonal time-scales which are appropriate because watershed phosphorus loads are normally impacted by seasonal conditions.

MPCA utilized the Hydrological Simulation Program – Fortran (HSPF) to model hydrology and water quality in the watershed (Section 3.5.1.2 of the final TMDL document). HSPF is a comprehensive watershed hydrology and water quality model that includes modeling and subsurface hydrologic and water quality processes, which can be linked to corresponding stream and reservoir processes. The model can be run to focus on specific environmental conditions, such as high or low flows or seasons, and can simulate the fate and transport of modelled pollutants.

MPCA utilized the model calibration process to determine the impact of internal phosphorus loading on water quality (Section 4.1.1 of the final TMDL document). The sediment core study for Myrtle Lake noted that internal loading was present in portions of the lake. Based upon the results, MPCA added an additional factor to account for internal loading of phosphorus in Myrtle Lake, beyond the implicit internal loading factor incorporated in BATHTUB (Section 4.1.1 of the final TMDL document). After the model was calibrated, MPCA reduced the phosphorus loadings based upon several assumptions (Section 4.1.1 of the final TMDL document):

1. Reducing tributary loadings;
2. Septic systems are in compliance;
3. No change to atmospheric deposition; and
4. Internal loading/unidentified sources reduced until WQS met.

Loading capacities (pounds per day (lb/day)) were calculated for the year using BATHTUB and then allocated to the WLA, LA, and the margin of safety (MOS). The results are summarized in Table 4 of this Decision Document.

Table 4: TMDL Summary for Myrtle Lake (69-0749-00)

Load Component		TMDL TP load	
		(lb/yr)	(lb/day)
Wasteload Allocations	Construction stormwater (MNR100001)	0.77	0.0021
	Industrial stormwater (MNR50000 and MNG490000)	0.77	0.0021
	Total WLA	1.54	0.0042
Load Allocation		956	2.6
MOS		106	0.29
Loading Capacity		1064	2.9
Existing Load		1497	4.1
Percent load reduction		29%	29%

Conclusion: EPA supports the data analysis and modeling approach utilized by MPCA in its calculation of wasteload allocations, load allocations and the margin of safety for the Myrtle Lake phosphorus TMDL. EPA finds MPCA’s approach for calculating the loading capacity for the TMDL to be reasonable and consistent with EPA guidance.

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

4. Load Allocations (LA)

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:

MPCA determined the LA for Myrtle Lake phosphorus TMDL based on the applicable WQS (Table 4 of this Decision Document). MPCA identified several nonpoint sources which contribute nutrient loading to Myrtle Lake (Section 4.1 of the final TMDL document). In Section 3.5.2 and Table 9 of the final TMDL document, MPCA discussed the current nonpoint source loads to Myrtle Lake. MPCA identified the “internal and unidentified” source category as the largest load impacting Myrtle Lake (Section 3.5.2 of the final TMDL document). For the TMDL, MPCA did not calculate LAs for the source categories; the LA is a “gross allotment”.

EPA finds MPCA’s approach for calculating the LA to be reasonable. The EPA finds that the TMDL document submitted by 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 stated that there are no wastewater treatment facilities (WWTF), municipal separate storm sewer systems (MS4), or concentrated animal feeding operations (CAFO) in the watershed. The only WLAs developed by MPCA are to address potential loadings from construction or industrial stormwater runoff.

Construction and Industrial Stormwater: MPCA calculated a portion of the WLA and assigned it to both construction stormwater and industrial stormwater (Table 4 of this Decision Document). Overall, the construction and industrial stormwater WLA make up a very small portion of the overall loading capacity but MPCA wanted to recognize their contributions. Both of these WLAs were represented as a categorical WLA and WLAs were not subdivided out into individual WLAs. The industrial stormwater WLA was set equal to the construction stormwater WLA. MPCA noted there is one permitted industrial stormwater site in the watershed, but determined that it has little to no impact on the Myrtle Lake phosphorus impairment (Section 3.5.1.1 of the final TMDL document).

MPCA's calculation of construction and industrial stormwater WLAs was based on their review of average construction activity within the Vermilion River watershed (0.08%). For the lake TMDL, the construction stormwater WLA was calculated as the construction stormwater percent area multiplied by the existing watershed load. It is assumed by MPCA that loads from permitted construction stormwater sites that operate in compliance with their permits are meeting the WLA.

Attaining the construction stormwater and industrial stormwater loads described in the phosphorus TMDL is the responsibility of construction and industrial site managers. In the final TMDL document MPCA explained that if a construction site owner/operator obtains coverage under the NPDES/SDS General Stormwater Permit (MNR100001) and properly selects, installs and maintains all BMPs required under MNR100001 and applicable local construction stormwater ordinances, including those related to impaired waters discharges and any applicable additional requirements found in Appendix A of the Construction General Permit, the stormwater discharges would be expected to be consistent with the WLA in this TMDL. BMPs and other stormwater control measures which act to limit the discharge of the pollutant of concern (phosphorus) are defined in MNR100001.

The MPCA is responsible for overseeing industrial stormwater loads which impact water quality to Myrtle Lake and the surrounding watershed. Industrial sites within the lake subwatershed are expected to comply with the requirements of the State's NPDES/SDS Industrial Stormwater Multi-Sector General Permit (MNR050000) or NPDES/SDS General Permit for Construction Sand & Gravel, Rock Quarrying and Hot Mix Asphalt Production facilities (MNG490000). MPCA explained that if a facility owner/operator obtains coverage under the appropriate

NPDES/SDS General Stormwater Permit and properly selects, installs and maintains all BMPs required under the permit, the stormwater discharges would be expected to be consistent with the WLA in this TMDL. BMPs and other stormwater control measures which act to limit the discharge of the pollutant of concern (phosphorus) are defined in MNR050000 and MNG490000.

The NPDES program requires construction and industrial sites to create SWPPPs which summarize how stormwater pollutant discharges will be minimized from construction and industrial sites. Under the MPCA's Stormwater General Permit (MNR100001) and applicable local construction stormwater ordinances, managers of sites under construction or industrial stormwater permits must review the adequacy of local SWPPPs to ensure that each plan complies with the applicable requirements in the State permits and local ordinances. As noted above, MPCA has explained that meeting the terms of the applicable permits will be consistent with the WLAs set in the Myrtle Lake phosphorus TMDL. In the event that the SWPPP does not meet the WLA, the SWPPP will need to be modified within 18-months of EPA's approval of the TMDL. This applies to sites under permits for MNR100001, MNR050000 and MNG490000.

EPA finds the MPCA's approach for calculating the WLA for the Myrtle Lake phosphorus TMDL to be reasonable and consistent with EPA guidance.

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:

MPCA explained that the Myrtle Lake phosphorus TMDL calculated an explicit MOS of 10% (Section 4.1.4 of the final TMDL document). MPCA determined this was sufficient MOS based upon the calibration of the HSPF and BATHTUB models. The HSPF model utilized flow data and sampling data from the Vermilion River watershed first developed as part of the Lake of the Woods TMDL effort. In addition, MPCA noted that the BATHTUB model demonstrated close agreement with the Myrtle Lake water quality sampling data, indicating the model was a valid representation of the system, and thus no further MOS was justified (Section 4.1.4 and Appendix A of the final TMDL document). The MOS is noted in Table 4 of this Decision Document.

The EPA finds that the TMDL document submitted by MPCA contains an appropriate MOS satisfying 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 was considered for the Myrtle Lake phosphorus TMDL via the nutrient targets which were based on the average nutrient values collected during the growing season (June 1 to September 30). The water quality targets were designed to meet the site specific criteria during the period of the year where the frequency and severity of algal growth is the greatest.

The Minnesota eutrophication standards state that total phosphorus WQS are defined as the mean concentration of phosphorus values measured during the growing season. In the Myrtle Lake phosphorus TMDL effort, the LA and WLA estimates were calculated from modeling efforts which incorporated mean growing season total phosphorus values. Nutrient loading capacities were set in the TMDL development process to meet the site specific criteria during the most critical period. The mid-to-late summertime period is typically when eutrophication standards are exceeded and water quality within the Myrtle Lake is deficient. By calibrating the modeling efforts to protect these water bodies during the worst water quality conditions of the year, it is assumed that the loading capacities established by the TMDL will be protective of water quality during the remainder of the calendar year (October through May).

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

8. Reasonable Assurance

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:

The Myrtle Lake phosphorus TMDL provide reasonable assurance that actions identified in the implementation sections of the TMDL (i.e., Sections 6 and 8 of the final TMDL document) will be applied to attain the loading capacities and allocations calculated for Myrtle Lake. The recommendations and requirements made by MPCA will be successful at improving water quality if the appropriate local groups work to implement these recommendations.

Stormwater:

The MPCA stormwater program requires construction and industrial sites to create a SWPPP that summarizes how stormwater will be minimized from a site. Permittees are required to review the adequacy of their SWPPPs to ensure that each plan meets WLA set in the TMDL. In the event that the SWPPP does not meet the WLA, the SWPPP will need to be modified prior to the effective date of the next General Permit.

Other Actions: The Myrtle Lake watershed is in the Vermilion River watershed (Section 6 of the final TMDL document). MPCA developed a Watershed Restoration and Protection Strategy for the Vermilion River watershed, which includes Myrtle Lake. The WRAPS document was approved by MPCA on January 20, 2022, and is found at <https://www.pca.state.mn.us/sites/default/files/wq-ws4-86a.pdf>.

The WRAPS provides information on the development of scientifically-supported restoration and protection strategies for implementation planning and action. MPCA sees the WRAPS document as a starting point for which MPCA and local partners can develop tools that will help local governments, land owners, and special interest groups determine: (1) the best strategies for making improvements and protecting resources that are already in good condition, and (2) focusing implementation strategies to specific locations within the Myrtle Lake and Vermilion River waters where implementation efforts will produce the greatest water quality improvements.

MPCA has been working with various local government and stakeholder groups to implement actions that will reduce pollutant loading to Myrtle Lake (Section 6.4 of the final TMDL document). St. Louis County has a Comprehensive Water Use Plan (<https://www.stlouiscountymn.gov/Portals/0/Library/Dept/Planning%20%26%20Development/Land-Use/Wetlands/Approved%20Water%20Plan%20ammendment%20%206-29-15.pdf>) to address water quality issues in the county. The Plan specifically identifies efforts needed in the Myrtle Lake watershed to address the nutrient impairment. MPCA also noted the numerous meetings and workshops that have been held in the county to address Best Management Practices (BMPs) to address shoreline protection efforts, septic systems controls, and other outreach efforts. MPCA noted that the landowners in the Myrtle Lake area were specifically targeted for these efforts (Section 6.4 of the final TMDL document).

Various funding mechanisms will be utilized to execute the recommendations made in the implementation section of this TMDL. The Clean Water Legacy Act (CWLA) was passed in

Minnesota in 2006 for the purposes of protecting, restoring, and preserving Minnesota water. The CWLA provides the protocols and practices to be followed in order to protect, enhance, and restore water quality in Minnesota. The CWLA outlines how MPCA, public agencies and private entities should coordinate in their efforts toward improving land use management practices and water management. The CWLA anticipates that all agencies (i.e., MPCA, public agencies, local authorities and private entities, etc.) will cooperate regarding planning and restoration efforts. Cooperative efforts would likely include informal and formal agreements to jointly use technical, educational, and financial resources.

The CWLA also provides details on public and stakeholder participation, and how the funding will be used. In part to attain these goals, the CWLA requires MPCA to develop WRAPS. The WRAPS are required to contain such elements as the identification of impaired waters, watershed modeling outputs, point and nonpoint sources, load reductions, etc. ([Chapter 114D.26](#); CWLA). The WRAPS also contain an implementation table of strategies and actions that are capable of achieving the needed load reductions, for both point and nonpoint sources ([Chapter 114D.26](#), Subd. 1(8); CWLA). Implementation plans developed for the TMDLs are included in the table, and are considered “priority areas” under the WRAPS process ([Watershed Restoration and Protection Strategy Report Template](#), MPCA). This table includes not only needed actions but a timeline for achieving water quality targets, the reductions needed from both point and nonpoint sources, the governmental units responsible, and interim milestones for achieving the actions. MPCA has developed guidance on what is required in the WRAPS ([Watershed Restoration and Protection Strategy Report Template](#), MPCA).

The Minnesota Board of Soil and Water Resources administers the Clean Water Fund as well, and has developed a detailed grants policy explaining what is required to be eligible to receive Clean Water Fund money (http://bwsr.state.mn.us/cwf_programs).

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 describes the additional data to be collected to determine if the load reductions provided for in the TMDL are occurring and leading to attainment of water quality standards.

Comment:

The final TMDL document outlines the water monitoring efforts in the Myrtle Lake in Section 7 of the final TMDL document. Water quality monitoring is a critical component of the adaptive management strategy employed as part of the implementation efforts utilized in the Vermilion River Watershed. Water quality information will aid watershed managers in

understanding how BMP pollutant removal efforts are impacting water quality. Water quality monitoring combined with an annual review of BMP efficiency will provide information on the success or failure of BMP systems designed to reduce pollutant loading into water bodies of the Vermilion River Watershed. Watershed managers will have the opportunity to reflect on the progress or lack of progress and will have the opportunity to change course if progress is unsatisfactory. Review of BMP efficiency is expected to be completed by the local and county partners.

Progress of TMDL implementation will be measured through regular monitoring efforts of water quality and total BMPs completed. It is anticipated that Myrtle Lake will also be monitored once every 10 years as part of the MPCA's Intensive Watershed Monitoring cycle.

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:

The findings from the Myrtle Lake phosphorus TMDL will be used to guide the implementation activities as part of the Myrtle Lake/Vermilion River WRAPS process.

Internal Loading: MPCA provided information on internal loading contributions in Myrtle Lake (Section 3.4 of the final TMDL document). The use of alum was discussed by MPCA to address the existing phosphorus-rich sediment in the lake (Section 8.2 of the final TMDL document). However, MPCA noted that unless external sources of phosphorus were controlled, attempts to address the internal phosphorus loads were unlikely to last.

Watershed Runoff: MPCA expects to continue working with local landowners to develop and maintain vegetative buffers along the shoreline. MPCA also plans to pursue other BMP efforts such as rain gardens, lawn management, and coordinating with road authorities to assess road crossings and applying BMPs as needed.

Fishery Management: MPCA noted that the Minnesota Department of Natural Resources (MDNR) has been stocking Myrtle Lake with walleye for many years. MPCA noted that MDNR recently changed some of the stocking practices, and will be working with MDNR to determine if this change may be affecting the fishery composition and those species that consume algae.

Septic Systems: MPCA will continue to work with St. Louis County to update the inventory of septic systems in the watershed, and prioritize compliance with local requirements.

Education and Outreach Efforts: Increased education and outreach efforts to the general public bring greater awareness to the issues surrounding pollutant contamination and strategies to reducing loading and transport of phosphorus. Education efforts targeted to the general public are commonly used to provide information on the status of impacted waterways as well as to address nutrient contributions to surface waters of the Vermilion River Watershed. Education can also be targeted to municipalities, wastewater system operators, land managers and other groups who play a key role in the management of pollutant sources.

The EPA finds that this criterion has been adequately addressed. The EPA reviews but does not approve implementation plans.

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)(1)(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:

Throughout the development of the Myrtle Lake phosphorus TMDL the public was given various opportunities to participate (Section 9 of the final TMDL document). MPCA held two stakeholders meetings in Orr, Minnesota on August 3, 2018, and July 19, 2019. These meetings were held to obtain local knowledge of the lake, and to supply landowners with information on the TMDL process. Two other meetings were held in the area regarding the Vermilion River WRAPS process. These meetings were held in Orr, Minnesota on November 13, 2017, and in Ely, Minnesota on November 16, 2017. These meetings addressed the larger Vermilion River watershed, but also included specific discussions of the Myrtle Lake impairment.

MPCA posted the draft TMDL online at (<http://www.pca.state.mn.us/water/tmdl>) for a public comment period. The public comment period was started on August 30, 2021, and ended on October 29, 2021. The MPCA received no comments on the TMDL.

The EPA finds that the TMDL document submitted by 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 water body, and the pollutant(s) of concern.

Comment:

The EPA received the final Myrtle Lake phosphorus TMDL, the submittal letter, and accompanying documentation from MPCA on January 21, 2022. The transmittal letter explicitly stated that the final TMDL referenced in Table 1 of this Decision Document was being submitted to EPA pursuant to Section 303(d) of the Clean Water Act for EPA final review and approval.

The letter clearly stated that this was a final TMDL submittal under Section 303(d) of CWA. The letter also contained the name of the waterbody as it appears on Minnesota's 303(d) list, and the causes/pollutants of concern. This TMDL was submitted per the requirements under Section 303(d) of the Clean Water Act and 40 C.F.R. 130.

The EPA finds that the TMDL transmittal letter submitted for the Myrtle Lake phosphorus TMDL by MPCA satisfies the requirements of this twelfth element.

13. Conclusion

After a full and complete review, the EPA finds that the one phosphorus for Myrtle Lake satisfies all elements for an approvable TMDL. This TMDL approval is for **one (1) TMDL**, addressing Myrtle Lake for aquatic recreational use impairment (Table 1 of this Decision Document).

The EPA's approval of these TMDLs extends to the water bodies which are identified above with the exception of any portions of the water bodies that are within Indian Country, as defined in 18 U.S.C. Section 1151. The EPA is taking no action to approve or disapprove TMDLs for those waters at this time. The EPA, or eligible Indian Tribes, as appropriate, will retain responsibilities under the CWA Section 303(d) for those waters.