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

REPLY TO THE ATTENTION OF:
W-16J

July 28, 2021

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 (TMDLs) for segments within the Marsh River Watershed (MRW), including supporting documentation. The MRW is located in northwestern Minnesota. The MRW TMDLs were calculated for bacteria and total suspended solids to address the impaired aquatic recreation and aquatic life uses.

The MRW TMDLs meet 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) bacteria TMDL and one (1) total suspended solids TMDL. EPA describes Minnesota's compliance with the statutory and regulatory requirements in the enclosed decision document.

EPA acknowledges Minnesota's efforts in submitting these TMDLs 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,

Digitally signed by Fong, Tera
Date: 2021.07.28 10:01:34 -05'00'

Tera L. Fong
Division Director, Water Division

Cc: Danielle Kvasager, MPCA

wq-iw5-20g

TMDL: Marsh River Watershed TMDLs in Norman, Clay and Polk Counties, Minnesota
Date: 7/28/2021

DECISION DOCUMENT FOR THE MARSH RIVER WATERSHED TMDLS, 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:

The Marsh River Watershed (MRW) in northwestern Minnesota is located near the border between North Dakota and Minnesota. The Marsh River begins at a diked diversion on the Wild Rice River, southeast of Ada, Minnesota (Section 3 of the final TMDL document). The Marsh River flows northwest until it reaches the confluence with the Red River of the North. The river is approximately 51 miles in length, and the drainage area is approximately 285 square miles (Table 5 of the final TMDL document). Several small streams and tributaries flow into river. Over 67% of the waterbodies in the TMDL watershed have been hydrologically altered for agricultural use. The connection between the Wild Rice River and Marsh River is used for flood management purposes. MPCA noted that water is allowed to flow over the dike from the Wild Rice River into the Marsh River when water levels are high in the Wild Rice River.

The Minnesota Pollution Control Agency's (MPCA) 2020 List of Impaired Waters identified a total of 13 aquatic life and aquatic recreation impairments in 4 water bodies in the MRW (Table 1 of the final TMDL document). The impaired waterbody (i.e., the Marsh River segment (-503)) that received TMDLs in today's action is listed in Table 1 of this Decision Document and shown in Figure 1 of the final TMDL document. A total of two TMDLs were developed for the Marsh River, one for excessive *E. coli*, and one for excessive total suspended solids (TSS).

Table 1: TMDLs Approved in the Marsh River Watershed TMDL

AUID (09020107###)	Waterbody	Designated Use Classes	Pollutant	Affected Use [c]	Listing Year	TMDL Target Completion Year	Addressed?
-503	Marsh River, Headwaters to Red R	2Bg [a], 3C	*E. coli*	AQR	2018	2028	**Yes**: *E. coli* TMDL
			Benthic macroinvertebrates bioassessments	AQL	2018	2028	**Yes:** TSS TMDL
			Fish bioassessments	AQL	2018	2028	
			Turbidity [b]	AQL	2008	2028	
			Dissolved oxygen	AQL	2010	2028	No [d]

[a] Tiered aquatic life use (TALU) designations: m = modified, g = general, and e = exceptional.

[b] Total suspended solids standards replaced the turbidity standards in 2015 and *E. coli* standards replaced fecal coliform standards in 2008.

[c] AQR = aquatic recreation, AQL = aquatic life

[d] More data and research is needed to determine if the low DO is due to a pollutant for which a TMDL can be developed.

Table 1 of the final TMDL document also identifies the other impairments in the waterbodies of the MRW. MPCA determined that the waters in the MRW are also impaired for additional causes, including macroinvertebrate bioassessments, fish bioassessments, disolved oxygen, and mercury. During the development of the MRW TMDLs, MPCA determined that some of these impairments will be also addressed by the approved TMDLs, while others will be deferred until additional monitoring is performed (Section 1.2 and Table 1 of the final TMDL document).

Land Use:
MPCA describes the MRW land use in Section 3.3 and Table 6 of the final TMDL document. The land use is predominately cultivated cropland (88%), with some developed land and wetlands (Table 2 of this Decision Document). The City of Ada is located in the watershed, with a population of 1,700.

Table 2: Land use summary for the MRW TMDL

8-HUC/10-HUC subwatershed	Cropland	Rangeland	Developed	Wetland	Open Water	Forest/ Shrub	Barren/ Mining
0902010705 [a]	88.0%	0.9%	3.6%	6.2%	0.2%	1.2%	0.01%

[a] This 10-HUC contains, and is the drainage basin for, the impaired waterbody addressed in this report (Marsh River, AUID 503).

Problem Identification:
Bacteria TMDL:
The Marsh River segment (-503) was included on the final 2020 Minnesota 303(d) list due to excessive bacteria. Section 3.4.1 of the final TMDL document describes water quality monitoring within the MRW and indicates that the river was not attaining the designated aquatic recreation use due to exceedances of the bacteria criteria. Excessive bacteria can negatively impact recreational uses (e.g., swimming, wading, boating, fishing, etc.) and public health. At elevated levels, bacteria may cause illness within humans who have contact with or ingest bacteria laden water. Recreation-based contact can lead to ear, nose, and throat infections, and stomach illness.

TSS TMDL:
The Marsh River segment (-503) was included on the final 2020 Minnesota 303(d) list due to excessive sediment within the water column. Water quality monitoring within the MRW (Section 3.4.2 of the final TMDL document) indicated that this segment was not attaining the designated aquatic life use due to TSS measurements and the negative impact of those conditions on fish and macroinvertebrate communities.

TSS is a measurement of the sediment and organic material that inhibits natural light from penetrating the surface water column. When in suspension, sediment can limit visibility and light penetration which may impair foraging and predation activities by certain species. Excess sediment and organic material may create turbid conditions within the water column and may increase the costs of treating surface waters used for drinking water or other industrial purposes (e.g., food processing). Excessive sediment and organic material within the water column can negatively impact fish and macroinvertebrates within the ecosystem via reducing spawning and rearing areas for certain fish species, clogging gills and abrading fish tissue and subjecting

sensitive species to unnecessary stress. Excessive amounts of fine sediment in stream environments can degrade aquatic communities.

Excessive fine sediment also may degrade aquatic habitats, alter natural flow conditions in stream environments and add organic materials to the water column. Excess sediment can fill pools, embed substrates, and reduce connectivity between different stream habitats. The result is a decline in habitat types that, in healthy streams, support diverse macroinvertebrate communities. Excess sediment can reduce spawning and rearing habitats for certain fish species. Flow alterations in the MRW have resulted from drainage improvements on or near agricultural lands. Channelization and contributions from agricultural drain tiles can result in higher peak flows during storm events and flashier flows which erode streambanks and carry sediment loads to streams. Sediment inputs from these flow events can settle in low gradient reaches like some of the low gradient reaches found in portions of the MRW.

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 TMDL priorities with the watershed approach and Watershed Restoration and Protection Strategy (WRAPS) cycle. The schedule for TMDL completion corresponds to the WRAPS report completion on the 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. The waters of the MRW addressed by this TMDL are part of the MPCA prioritization plan to meet EPA's national measure.

Pollutants of Concern:
The pollutants of concern are bacteria (*E. coli*) and TSS.

Source Identification (point and nonpoint sources):
Point Source Identification: The potential point sources to the MRW are:

<u>Bacteria Point Sources:</u>
National Pollutant Discharge Elimination Systems (NPDES) permitted facilities: MPCA identified two NPDES permitted facilities that impact the Marsh River segment (-503). These facilities may contribute bacteria loads to surface waters through discharges of treated wastewater (Section 3.5.1.1 of the final TMDL document). Permitted facilities must discharge wastewater according to their NPDES permit. MPCA assigned these two facilities a portion of the bacteria wasteload allocation (WLA). Further information regarding the WLAs are found in Section 5 of this Decision Document.

Municipal Separate Storm Sewer System (MS4) communities: MPCA determined that there are no MS4 dischargers, Combined Sewer Overflows (CSOs) nor Sanitary Sewer Overflow (SSOs) in the Marsh River Watershed (Section 3.5.1 of the final TMDL document).

Concentrated Animal Feedlot Operations (CAFOs): MPCA stated that there are no identified CAFOs in the TMDL watershed, but noted that there is a large CAFO currently being proposed to be sited near Ada which may require a NPDES/SDS permit (Section 3.5.1 of the final TMDL document).

Permitted Construction and Industrial Stormwater: MPCA determined that permitted construction and industrial stormwater discharges are not significant sources of bacteria in the watershed, and therefore did not develop an allocation for bacteria for these sources (Section 4.3.3.1 of the final TMDL document).

TSS Point Sources:

NPDES permitted facilities: MPCA identified two municipal WWTPs that contribute sediment loads to Marsh River segment (-503) (Section 3.5.2.1 of the final TMDL document). Permitted facilities must discharge wastewater according to their NPDES permit. MPCA assigned each of these facilities a portion of the TSS allocation. Further information regarding the WLAs are found in Section 5 of this Decision Document.

Regulated Stormwater: MPCA determined that there are no MS4 dischargers, CAFOs, CSOs nor SSOs in the Marsh River Watershed (Section 3.5.2.1 of the final TMDL document).

Permitted Construction and Industrial Stormwater: MPCA determined that a small portion of the MRW watershed includes lands addressed under a construction stormwater permit (Sections 3.5.2.1 and 4.4.3.1 of the final TMDL document). MPCA reviewed local records and determined that the approximate annual percentage of land area under construction has been 0.014% in the watershed. MPCA noted that there is very little regulated industrial stormwater in the watershed, and assigned a small allocation (0.014%) of the TSS load to this source. Section 5 of this Decision Document further discusses the WLA for stormwater in the TMDLs. Construction and industrial sites may contribute pollutants via runoff during stormwater events. These areas within the MRW 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 MRW are:

Bacteria NPS sources: MPCA summarized nonpoint sources potentially contributing bacteria to segment -503 in Section 3.5.2.2 of the final TMDL document.

Stormwater from agricultural land use practices and feedlots near surface waters: Animal Feeding Operations (AFOs) in close proximity to surface waters can be a source of bacteria to waterbodies in the MRW. These areas may contribute bacteria via the mobilization and transportation of pollutant laden waters from feeding, holding and manure storage sites. Feedlots generate manure which may be spread onto agricultural lands and be transported by stormwater to waterbodies and fields. Tile drainage lines increase stormwater flow velocities and reduce the time available for bacteria to die-off.

Unrestricted livestock access to streams: Livestock with access to stream environments may add bacteria directly to the surfaces waters or resuspend particles on the stream bottom causing very high localized bacteria counts and may contribute to downstream impairments. Smaller animal facilities may add bacteria to surface waters via wastewater from these facilities or stormwater runoff from near-stream pastures.

Discharges from Subsurface Sewage Treatment Systems (SSTS) or unsewered communities: Failing septic systems are a potential source of bacteria within the MRW. Septic systems 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. Failing SSTS are specifically defined as systems that are failing to protect groundwater from contamination. Systems which discharge partially treated sewage to the ground surface, road ditches, tile lines, and directly into streams, rivers and lakes are considered an imminent threat to public health and safety (ITPHS). ITPHS systems also include illicit discharges from unsewered communities.

Wildlife: Wildlife is a known source of bacteria in water bodies as many animals spend time in or around water bodies. Deer, geese, ducks, raccoons, and other animals all create potential sources of bacteria via contaminated runoff from animal habitats, such as urban park areas, forest, and rural areas.

TSS NPS Sources: MPCA explained in Section 3.5.2 and Figure 8 of the final TMDL document the various sources of sediment impacting the Marsh River segment (-503). A detailed analysis of potential nonpoint for segment -503 is found in this section of the TMDL; a summary is below.

Stream channelization and stream erosion: Eroding streambanks and channelization efforts may add nutrients, organic material and organic-rich sediment to local surface waters. Nutrients may be added if there is particulate phosphorus bound with eroding soils. Eroding riparian areas may be linked to soil inputs within the water column and potentially to changes in flow patterns. Changes in flow patterns may also encourage down-cutting of the streambed and streambanks. Stream channelization efforts can increase the velocity of flow (via the removal of the sinuosity of a natural channel) and disturb the natural sedimentation processes of the streambed.

Stormwater runoff from agricultural land use and feedlot practices: Similar to the discussion above in *Bacteria NPS Sources,* runoff from agricultural lands may contain significant amounts of sediment which may lead to impairments in the MRW.

Wetland and Forest Sources: Sediment may be added to surface waters by stormwater flows through wetland or forested areas in the MRW. Storm events may mobilize decomposing vegetation, organic soil particles through the transport of suspended solids and other organic debris.

Future Growth:

MPCA did not calculate a reserve capacity of the TMDLs (Sections 4.3.6 and 4.4.6 of the final TMDL document). Any expansion of point or nonpoint sources will need to comply with the respective WLA and load allocation (LA) values calculated in the MRW TMDLs.

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. The segment addressed by the MRW TMDLs is designated as a Class 2B water (Table 1 and Section 2 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).

Bacteria Criteria: The bacteria TMDL target employed for the MRW bacteria TMDL is the *E. coli* standards as stated in Table 3 of this Decision Document. The focus of this TMDL is on the **126 organisms (orgs) per 100 mL** (126 orgs/100 mL) portion of the standard (Section 4.3.1 of the final TMDL document). MPCA believes that using the 126 orgs/100 mL portion of the standard for TMDL calculations will result in the greatest bacteria reductions within the MRW and will result in the attainment of the 1,260 orgs/100 mL portion of the standard. While the bacteria TMDL will focus on the geometric mean portion of the water quality standard, attainment of both parts of the water quality standard is required.

TSS Criteria: Numeric criteria for TSS are set forth in Minnesota Rules 7050.0222. These criteria are based upon the appropriate region of the state. The TSS criteria applicable in the MRW is **65 mg/L** TSS to be exceeded no more than 10% of the time (Section 2.4.1 of the final TMDL document). The MRW is in the Southern River Nutrient Region.

Table 3: Numeric Criteria for the MRW TMDL

Parameter	Units	Water Quality Standard
***E. coli* ***	# of organisms / 100 mL	The geometric mean of a minimum of 5 samples taken within any calendar month may not exceed **126** organisms
		No more than 10% of all samples collected during any calendar month may individually exceed **1,260** organisms
TSS**	mg/L	**65** (cannot be exceeded more than 10% of the time)

* - Standards apply only between April 1 and October 31

** - Standard applies only between April 1 and September 30

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 steam 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:
Bacteria TMDL:
MPCA used the geometric mean (126 orgs/100 mL) of the *E. coli* water quality standard to calculate loading capacity values for the bacteria TMDLs as described in Section 4.3 of the final TMDL document. MPCA believes the geometric mean of the WQS provides the best overall characterization of the status of the watershed. EPA agrees with this assertion, as stated in the preamble of, *"The Water Quality Standards for Coastal and Great Lakes Recreation Waters Final Rule"* (69 FR 67218-67243, November 16, 2004) on page 67224, "…the geometric mean is the more relevant value for ensuring that appropriate actions are taken to protect and improve water quality because it is a more reliable measure, being less subject to random variation, and more directly linked to the underlying studies on which the 1986 bacteria criteria were based." MPCA stated that the bacteria TMDLs will focus on the geometric mean portion of the water quality standard (126 orgs/100 mL) and that it expects that by attaining the 126 orgs/100 mL portion of the *E. coli* WQS the 1,260 orgs/100 mL portion of the *E. coli* WQS will also be attained. EPA finds these assumptions to be reasonable.

Typically loading capacities are expressed as a mass per time (e.g., pounds per day). However, for *E. coli* loading capacity calculations, mass is not always an appropriate measure because *E. coli* is expressed in terms of organism counts. This approach is consistent with the EPA's regulations which define "load" as "an amount of matter that is introduced into a receiving water" (40 C.F.R. §130.2). To establish the loading capacities for the MRW bacteria TMDL,

MPCA used Minnesota's WQS for *E. coli* (126 orgs/100 mL). A loading capacity is, "the greatest amount of loading that a water can receive without violating water quality standards." (40 C.F.R. §130.2). Therefore, a loading capacity set at the WQS will assure that the water does not violate WQS. MPCA's *E. coli* TMDL approach is based upon the premise that all discharges (point and nonpoint) must meet the WQS when entering the water body. If all sources meet the WQS at discharge, then the water body should meet the WQS and the designated use.

A separate flow duration curve (FDCs) was created for the bacteria TMDL in the MRW. MPCA compiled flow data from a variety of sources. Measured or simulated daily stream flows were used to develop load duration curves (LDC) and calculate TMDLs. MPCA noted there is limited data on flow within the MRW. MPCA utilized the Hydrological Simulation Program – Fortran (HSPF) to model hydrology and water quality in the watershed (Section 4.1.1 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 or modelled pollutants. For the LDCs, MPCA used the model to determine daily river flows along with daily flow data from a USGS flow gage on the Marsh River near Shelly, Minnesota. Flow data from 2007-2016 was utilized for the TMDL (Section 4.2 of the final TMDL document). The flow curves indicate that the Marsh River has little to no flow over a portion of the year (Figures 9 and 10 of the final TMDL document).

Flows were ranked from highest to lowest. Average daily flow values were assigned a flow rank value. The probability of exceedance of each average daily flow value was calculated as a percentage. This created the information needed to create a flow duration curve by plotting probability of exceedance (X-axis) against the flow level (logarithmic Y-axis). Using the allowable concentration of 126 orgs/100 mL and conversion factors, a LDC was developed to show the allowable billions of organisms per day of *E. coli* bacteria for each level of flow along the curve. The curved line on a LDC graph represents the TMDL of the respective flow conditions observed at that location.

The LDC data was used to determine the median loading capacity (LC) for each flow regime. Portions of the low flow and very low flow regimes (Figures 9 and 10 of the final TMDL document) were incomplete due to a lack of flow and zero-flow conditions that made up more than 10% of the LDC. Median values for flows and loads were calculated from the remaining records in those flow regimes after zero-flow records were excluded.

Water quality monitoring was completed in the MRW and measured *E. coli* concentrations were converted to individual sampling loads by multiplying the sample concentration by the instantaneous flow measurement observed/estimated at the time of sample collection and then by a conversion factor which allows the individual samples to be plotted on the same figure as the LDCs

The LDC plots were subdivided into five flow regimes; very high flow conditions (exceeded 0–10% of the time), high flow conditions (exceeded 10–40% of the time), mid-range flow conditions (exceeded 40–60% of the time), low flow conditions (exceeded 60–90% of the time), and very low flow conditions (exceeded 90–100% of the time). LDC plots can be organized to

display individual sampling loads with the calculated LDC. Watershed managers can interpret LDC graphs with individual sampling points plotted alongside the LDC to understand the relationship between flow conditions and water quality exceedances within the watershed. Individual sampling loads which plot above the LDC represent violations of the WQS and the allowable load under those flow conditions at those locations. The difference between individual sampling loads plotting above the LDC and the LDC, measured at the same flow, is the amount of reduction necessary to meet WQS.

The strengths of using the LDC method are that critical conditions and seasonal variation are considered in the creation of the FDC by plotting hydrologic conditions over the flows measured during the recreation season. Additionally, the LDC methodology is relatively easy to use and cost-effective. The weaknesses of the LDC method are that nonpoint source allocations cannot be assigned to specific sources, and specific source reductions are not quantified. Overall, EPA concurs with MPCA that the strengths outweigh the weaknesses for the LDC method.

Implementing the results shown by the LDC requires watershed managers to understand the sources contributing to the water quality impairment and which Best Management Practices (BMPs) may be the most effective for reducing bacteria loads based on flow magnitudes. Different sources will contribute bacteria loads under varying flow conditions. For example, if exceedances are significant during high flow events this would suggest storm events are the cause and implementation efforts can target BMPs that will reduce stormwater runoff and consequently bacteria loading into surface waters. This allows for a more efficient implementation effort.

In Section 4.3 of the final TMDL document, MPCA provides a TMDL summary table (Table 14 of the final TMDL document) for the bacteria TMDL. The loading capacity, load allocation, margin of safety, reserve capacity, and WLAs were calculated for the watershed drained by the Marsh River. The results of those calculations are found in Table 4 of this Decision Document. The load allocation was calculated after the determination of the WLA, and the Margin of Safety (MOS) (10% of the loading capacity). The load allocation (e.g., stormwater runoff from agricultural land use practices and feedlots, SSTS, wildlife inputs etc.) was not split among individual nonpoint contributors. Instead, the load allocation was combined together into a categorical LA to cover all nonpoint source contributions.

The TMDL using the LDC in this Decision Document reports five points (the midpoints of the designated flow regime) on the loading capacity curve. However, it should be understood that the components of the TMDL equation could be illustrated for any point on the entire loading capacity curve. The LDC method can be used to display collected bacteria monitoring data and allows for the estimation of load reductions necessary for attainment of the bacteria water quality standard. Using this method, daily loads were developed based upon the flow in the water body. Loading capacities were determined for the segment for multiple flow regimes. This allows the TMDL to be represented by an allowable daily load across all flow conditions. Table 4 of this Decision Document identifies the loading capacity at each flow regime. Although there are numeric loads for each flow regime, the complete LDC is being approved for this TMDL (Figure 9 of the final TMDL document).

Table 4: Marsh River (09020107-503) *E. coli* TMDL summary

E. coli		Flow zones				
		Very High	High	Mid-Range	Low	Very Low
		(billion org/day)				
Wasteload Allocation	**Total WLA**	**14.8**	**14.8**	***	***	***
	Ada WWTP (MNG585095)	11	11	***	***	***
	Shelly WWTP (MNG585227)	3.8	3.8	***	***	***
Load Allocation	**Total LA**	**892.4**	**71.6**	**14.4**	**1.53**	**0.00**
Margin of Safety (MOS)		**100.8**	**9.6**	**1.6**	**0.17**	**0.00**
Loading Capacity		**1,008**	**96**	**16**	**1.7**	**0.00**
Observed Load		626	100	20	1.4	N/A
Estimated Percent Reduction		0%	4%	20%	0%	N/A
Highest Observed Monthly Geometric Mean		147.4 org/100 mL				
Estimated representative percent reduction		14.5%				

*** = The permitted wastewater design flows exceed the stream flow in the indicated flow zones. The WLAs are expressed as an equation rather than an absolute number: WLA = (flow contribution from a given source) x 126 org/100 mL (or NPDES permit concentration). See Section 4.3.3.5 of the final TMDL document and Section 5 of this Decision Document for more details.

EPA concurs with the data analysis and LDC approach utilized by MPCA in its calculation of loading capacities, wasteload allocations, load allocations and the margin of safety for the Marsh River segment (-503) bacteria TMDL. The methods used for determining the TMDL are consistent with U.S. EPA technical memos.[1]

TSS TMDL: MPCA developed a LDC to calculate the sediment TMDL for Marsh River in Table 5 of this Decision Document (Section 4.4 of the final TMDL document). The LDC development strategies employed for the bacteria TMDL was also used to develop the sediment TMDL (e.g., the incorporation of HSPF model simulated flows to develop a FDC, water quality monitoring information collected within the MRW informing the LDC, etc.). The FDC was transformed into LDC for the Marsh River (-503) segment each stream AUID segment by multiplying individual flow values by the TSS criteria of 65 mg/L and then multiplying that value by a conversion factor.

The load allocation was calculated after the determination of the WLA, and the MOS. Load allocations (e.g., stormwater runoff from agricultural land use practices) was not split among individual nonpoint contributors. Instead, the load allocation was combined together into one value to cover all nonpoint source contributions. Table 5 in this Decision Document reports five points (the midpoints of the designated flow regime) on the loading capacity curve. However, it should be understood that the components of the TMDL equation could be illustrated for any point on the entire loading capacity curve. Although there are numeric loads for each flow regime, the LDC is what is being approved for this TMDL (Figure 10 of the final TMDL document).

[1] U.S. Environmental Protection Agency. August 2007. *An Approach for Using Load Duration Curves in the Development of TMDLs.* Office of Water. EPA-841-B-07-006. Washington, D.C.

Table 5: Marsh River (09020107-503) TSS TMDL Summary

Total Suspended Solids		Flow zones				
		Very High	High	Mid-Range	Low	Very Low
		[US tons/day]				
Wasteload Allocation	**Total WLA**	**0.60**	**0.582**	**0.5803**	***	***
	Ada WWTP (MNG585095)	0.43	0.43	0.43	***	***
	Shelly WWTP (MNG585227)	0.15	0.15	0.15	***	***
	Construction/Industrial Stormwater	0.02	0.002	0.0003	***	***
Load Allocation	**Total LA**	**56.1**	**4.818**	**0.3197**	**0.153**	**0.00**
Margin of Safety (MOS)		**6.3**	**0.60**	**0.10**	**0.017**	**0.00**
Loading Capacity		**63**	**6.0**	**1.0**	**0.17**	**0.00**
Observed Load		125	8.1	0.42	0.05	N/A
Estimated Percent Reduction		49.6%	25.9%	0%	0%	N/A
Observed 90th percentile concentration (mg/L)		92				
Overall estimated percent reduction		29%				

*** = The permitted wastewater design flows exceed the stream flow in the indicated flow zone(s). The WLAs are expressed as an equation rather than an absolute number: WLA = (flow contribution from a given source) x 65 mg/L (or NPDES permit concentration). See Section 4.4.3.5 of the final TMDL document or Section 5 of this Decision Document for more details.

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 Marsh River segment (-503) TSS TMDL. Additionally, EPA concurs with the loading capacities calculated by the MPCA in the sediment TSS TMDL. EPA finds MPCA's approach for calculating the loading capacity for the TSS TMDL to be reasonable and consistent with EPA guidance.

Other impairments: MPCA also determined the impacts of implementing the TMDLs on other impairments in the Marsh River (Section 1.2 of the final TMDL document). In Table 1 of the final TMDL document, the Marsh River is listed as impaired for macroinvertebrate bioassessment (MIBI), fish bioassessment (FIBI), and turbidity. A Stressor ID study by MPCA (MPCA, 2018) noted that both pollutant and non-pollutant stressors are contributing to the impaired biology in Marsh River (Table 3 and Section 1.2 of the final TMDL document). MPCA noted that high sediment levels have directly impacted the biology as well as indirectly contributing to the poor habitat in the system. MPCA has determined that the implementation of BMPs to control sediment will also improve habitat and flow regime problems in the river. MPCA noted that the Watershed Restoration and Protection Strategy (WRAPS) addresses all stressors in the Marsh River (Section 1.2 of the final TMDL document).

MPCA also noted that several impairments in the overall MRW are being deferred at this time (Table 1 of the final TMDL document). As discussed in Section 1.2 of the final TMDL document, MPCA has determined that additional data is needed to determine the cause of impairments in County Ditch 11, as well as the cause of the low dissolved oxygen impairment in the Marsh River. MPCA also noted that the mainstem of the Red River will be addressed in a separate TMDL document.

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 bacteria and TSS TMDLs. Additionally, EPA concurs with the loading capacities calculated by the MPCA for these TMDLs. EPA finds MPCA's approach for calculating the loading capacity for the TMDLs 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 calculations for each of the TMDLs based on the applicable WQS. MPCA recognized that LAs for each of the individual TMDLs addressed by the MRW TMDLs can be attributed to different nonpoint sources.

Bacteria TMDL: MPCA explains its method for determining the *E. coli* LA in Section 4.3 of the final TMDL document. MPCA identified several nonpoint sources which contribute bacteria loads to the surface waters of the MRW, including; stormwater from agricultural and feedlot areas, failing septic systems, and wildlife (e.g., deer, geese, ducks, and other animals). MPCA did not determine individual load allocation values for each of these potential nonpoint source considerations but aggregated the nonpoint sources into a categorical LA value. The calculated LA values for the Marsh River segment (-503) for each of 5 flow regimes are available in Table 4 of this Decision Document. Review of the LDC indicates that exceedances occur under multiple flow regimes.

TSS TMDL: The calculated LA values for the Marsh River segment (-503) TSS TMDL are applicable across all flow conditions (Table 5 of this Decision Document). MPCA identified several nonpoint sources which contribute sediment loads to the surface waters in the MRW (Figure 8 of the final TMDL document). Load allocations were recognized as originating from many diverse nonpoint sources including; stormwater contributions from agricultural lands, stream channelization and streambank erosion, and wetland and forest sources.

Nearly all the exceedances of the 65 mg/L TSS standard occurred during the high-flow events in the Marsh River (Figure 10 of the final TMDL document) when spring runoff and early-summer storms can cause high flows, channel erosion, and runoff from bare or freshly planted fields. MPCA did not determine individual load allocation values for each of these potential nonpoint source considerations but aggregated the nonpoint sources into one LA value.

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:
Bacteria TMDL: MPCA identified two NPDES permitted wastewater facilities within the MRW and assigned the facilities a portion of the WLA (Table 4 of this Decision Document). Both the Ada WWTF and the Shelley WWTF are pond systems, and are allowed to discharge from March 1 to June 30 and September 1 through December 30 with no discharge to ice-covered waters (Section 4.3.3.1 of the final TMDL document). The WLA for these facilities was calculated based on the facility's permitted maximum daily discharge rate and the permitted fecal coliform effluent limit. MPCA explained that the WLA for the WWTFs were calculated based on the *E. coli* WQS but WWTF permits are regulated for fecal coliform (200 orgs/100 mL as a 30-day geometric mean) and that if a facility is meeting its fecal coliform limits, which are set in the facility's discharge permit, MPCA assumes the facility is also meeting the calculated *E. coli* WLA from the MRW TMDL. The WLA was therefore calculated using the assumption that the *E. coli* standard of 126 orgs/100 mL provides equivalent protection from illness due to primary contact recreation as the fecal coliform WQS of 200 orgs/100 mL.

MPCA also noted that during the lower flow regimes, there was little to no flow in the river. At these flow conditions, the discharge flow from the ponds would exceed the instream flows. To account for these conditions, the WLA is expressed as a concentration rather than a load. As

noted in Table 4 of this Decision Document, the WLA for these conditions is the WQS for bacteria.

MS4 Stormwater – No MS4 dischargers were identified by MPCA within the TMDL watershed.

CAFOs – No CAFOs were identified by MPCA within the TMDL watershed.

Construction/Industrial Stormwater: MPCA determined that stormwater from construction or industrial sites are unlikely to contain significant amounts of bacteria, and therefore no WLA was developed for these sources (Section 4.3.3 of the final TMDL document).

EPA finds the MPCA's approach for calculating the WLAs for the MRW bacteria TMDL to be reasonable and consistent with EPA guidance.

TSS TMDL: MPCA identified two NPDES permitted facilities within the MRW and assigned those facilities a portion of the WLA (Table 5 of this Decision Document). Individual WLAs were calculated for each of these facilities based the maximum permitted daily discharge and the permit effluent limit of 45 mg/L TSS. In the Marsh River segment (-503) TMDL, MPCA noted that under very low flows, the permitted discharge flow from the facilities exceeded the actual instream flow. To address this, the facilities are limited to discharge at or below the effluent limit. The EPA notes this effluent limit (45 mg/L) is below the TSS criteria of 65 mg/L.

MS4 Stormwater: No MS4 dischargers were identified by MPCA within the TMDL watershed.

Construction and Industrial Stormwater: MPCA also calculated a portion of the WLA and assigned it to both construction stormwater and industrial stormwater. 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's calculation of construction and industrial stormwater WLAs was based on their estimate of average construction activity within Norman County. This estimate was area weighted for each impaired watershed. For the TSS TMDL, the construction stormwater WLA was calculated as the construction stormwater percent area (0.014%) 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 TSS 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 (sediment) are defined in MNR100001.

The MPCA is responsible for overseeing industrial stormwater loads which impact water quality in the MRW. Industrial sites 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 (sediment) 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 MRW TSS TMDL. In the event that the SWPPP does not meet the WLA, the SWPPP will need to be modified within 18-months of the approval of the TMDL by the EPA. This applies to sites under permits for MNR100001, MNR050000 and MNG490000.

EPA finds the MPCA's approach for calculating the WLA for the MRW TSS TMDLs 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:
The bacteria and TSS TMDLs incorporated an explicit MOS of 10% which was applied to the loading capacity (Sections 4.3.4 and 4.4.4 of the final TMDL document, Tables 4 and 5 of this Decision Document). MPCA explained that the explicit MOS was set at 10% due to the level of variability in sample results discovered during TMDL development.

For bacteria, MPCA noted that challenges associated with quantifying *E. coli* loads include the dynamics and complexity of bacteria in stream environments. Factors such as die-off and re-growth contribute to general uncertainty that makes quantifying stormwater bacteria loads particularly difficult. The MOS for the MRW bacteria TMDL also incorporated certain conservative assumptions in the calculation of the TMDL. No rate of decay, or die-off rate of pathogen species, was used in the TMDL calculations or in the creation of the load duration curve for *E. coli*. Bacteria have a limited capability of surviving outside their hosts, and normally a rate of decay would be incorporated. MPCA determined that it was more conservative to use the WQS (126 orgs/100 mL) and not to apply a rate of decay, which could result in a discharge limit greater than the WQS.

As stated in *EPA's Protocol for Developing Pathogen TMDLs* (EPA 841-R-00-002), many different factors affect the survival of pathogens, including the physical condition of the water. These factors include, but are not limited to sunlight, temperature, salinity, and nutrient deficiencies. These factors vary depending on the environmental condition/circumstances of the water, and therefore it would be difficult to assert that the rate of decay caused by any given combination of these environmental variables was sufficient to meet the WQS of 126 orgs/100 mL. Thus, it is more conservative to apply the State's WQS as the bacteria target value, because this standard must be met at all times under all environmental conditions.

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:
Bacteria TMDL: Bacterial loads vary by season, typically reaching higher numbers in the dry summer months when low flows and bacterial growth rates contribute to their abundance and reaching relatively lower values in colder months when bacterial growth rates attenuate and loading events, driven by stormwater runoff events aren't as frequent. Bacterial WQS need to be met between April 1st to October 31st, regardless of the flow condition. The development of the LDCs utilized simulated flow data which were validated and calibrated with local flow gage data. Modeled flow measurements represented a variety of flow conditions from the recreation season. LDCs developed from these modeled flow conditions represented a range of flow conditions within the MRW and thereby accounted for seasonal variability over the recreation season (Section 4.3.5 of the final TMDL document).

Critical conditions for *E. coli* loading occur in the dry summer months. This is typically when stream flows are lowest, and bacterial growth rates can be high. By meeting the water quality targets during the summer months, it can reasonably be assumed that the loading capacity values

will be protective of water quality during the remainder of the calendar year (November through March).

TSS TMDL: The TSS WQS applies from April to September which is also the time period when high concentrations of sediment are expected in the surface waters of the MRW (Section 4.4.5 of the final TMDL document). Sediment loading in the MRW varies depending on surface water flow, land cover and climate/season. Spring is typically associated with large flows from snowmelt, the summer is associated with the growing season as well as periodic storm events and receding streamflows, and the fall brings increasing precipitation and rapidly changing agricultural landscapes. In all season's sediment inputs to surface waters typically occur primarily through wet weather events. Critical conditions that impact the response of MRW water bodies to sediment inputs may typically occur during periods of low flow. During low flow periods, sediment can accumulate within the impacted water bodies, there is less assimilative capacity within the water body, and generally sediment is not transported through the water body at the same rate it is under normal flow conditions.

Critical conditions that impact loading, or the rate that sediment is delivered to the water body, were identified as those periods where large precipitation events coincide with periods of minimal vegetative cover on fields. Large precipitation events and minimally covered land surfaces can lead to large runoff volumes, especially to those areas which drain agricultural fields. The conditions generally occur in the spring and early summer seasons.

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 MRW bacteria and TSS TMDLs provide reasonable assurance that actions identified in the implementation section 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 the impaired reaches within the MRW. The recommendations made by MPCA will be successful at improving water quality if the appropriate local groups work to implement these recommendations. Those mitigation suggestions, which fall outside of regulatory authority, will require commitment from state agencies and local stakeholders to carry out the suggested actions.

MPCA has identified several local partners which have expressed interest in working to improve water quality within the MRW. Watershed districts (WD) (i.e., the Wild Rice Watershed District (WRWD)) have a significant role in the MRW in terms of monitoring, planning and implementation efforts. It is anticipated that WDs and other local watershed groups will work together to reduce pollutant inputs to the MRW. MPCA has authored a MRW WRAPS document, which was approved by MPCA in June 2021. 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) focus those strategies in the best places to do work (MPCA, 2021).

Continued water quality monitoring within the basin is supported by MPCA. Additional water quality monitoring results could provide insight into the success or failure of BMP systems designed to reduce bacteria, nutrient and sediment loading into the surface waters of the watershed. Local watershed managers would be able to reflect on the progress of the various pollutant removal strategies and would have the opportunity to change course if observed progress is unsatisfactory.

The MPCA regulates the collection, transportation, storage, processing and disposal of animal manure and other livestock operation wastes at State registered animal feeding operation facilities. The MPCA Feedlot Program implements rules governing these activities and provides assistance to counties and the livestock industry. The feedlot rules apply to most aspects of livestock waste management including the location, design, construction, operation and management of feedlots and manure handling facilities.

Reasonable assurance that the WLA set forth will be implemented is provided by regulatory actions. According to 40 C.F.R. 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's NPDES permit program are the implementing programs for ensuring WLA are consistent with the TMDL. The NPDES program requires construction and industrial sites to create SWPPPs which summarize how stormwater will be minimized from construction and industrial sites. Under the MPCA's Stormwater General Permit, managers of sites under construction or

industrial stormwater permits must review the adequacy of local SWPPPs to ensure that each plan meets WLA set in the MRW TMDLs. In the event that the SWPPP does not meet the WLA, the SWPPP will need to be modified. This applies to sites under the MPCA's General Stormwater Permit for Construction Activity (MNR100001) and its 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 noted that several local partners have been implementing actions and activities to control pollutants in the MRW for many years. The Marsh River Watershed is part of the larger Wild Rice River Watershed, and the comprehensive "One Watershed One Plan (1W1P) developed for Wild Rice Watershed District also includes the Marsh River (WRWD, 2020). The 1W1P project is a comprehensive planning tool to integrate the various local watershed efforts to address impairments in the watershed and is developed in conjunction with the Minnesota Board of Soil and Water Resources (BWSR). The plan focuses on reducing sediment loading as one of the goals for the watershed, and notes the various BMPs that will need to be implemented to implement the TMDL. Further information on the 1W1P process is available at http://bwsr.state.mn.us/one-watershed-one-plan.

Norman County has developed a "*Norman County Local Water Management Plan – 2017-2026*" (Water Plan) (Norman County, 2017), which outlines priorities and goals for the County. Goals include surface water protection, groundwater protection, and soil erosion control. In addition to pollutant controls in the MRW TMDL, the Water Plan identifies other impaired waters in the County, and identifies projects and plans to implement the various pollutant controls needed to address the impairments. The Water Plan provides cost estimates for addressing the identified goals.

Section 6.2 of the final TMDL document notes the various BMPs that have been implemented in the TMDL watershed. Figure 11 of the final TMDL document shows the numbers of BMPs in the various subwatersheds. Table 20 of the final TMDL document lists the various BMPs by type and total cost.

MPCA also highlighted the recent Buffer Law now in effect in Minnesota. This law requires perennial grass buffers to be planted along public waters. The width of the buffer depends upon the type and size of water body, and provides for financial support in installing these buffers. The buffers can filter out sediment and nutrients, as well as other pollutants.

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 MRW. Progress of TMDL implementation will be measured through regular monitoring efforts of water quality and total BMPs completed. MPCA anticipates that monitoring will be completed by local groups (e.g., WDs) and volunteers, as long as there is sufficient funding to support the efforts of these local entities. At a minimum, the MRW will be monitored once every 10 years as part of the MPCA's Intensive Watershed Monitoring cycle.

Water quality monitoring is a critical component of the adaptive management strategy employed as part of the implementation efforts utilized in the MRW. 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 MRW. 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.

River and stream monitoring in the MRW has been completed by a variety of organizations and funded by Clean Water Partnership Grants, and other available local funds. The 1W1P notes where on-going monitoring is occuring, and which agency is responsible (WRWD, 2020). MPCA noted that since there are many BMPs that have been developed, monitoring has not only focused on water quality, but BMP effectiveness monitoring as well. MPCA also identified several additional sites that should be monitored to provide additional data on the TMDLs.

MPCA anticipates that stream monitoring in the MRW should continue in order to build on the current water quality dataset and track changes based on implementation progress. Continuing to monitor water quality and biota scores in the listed segments will determine whether or not stream habitat restoration measures are required to bring the watershed into attainment with water quality standards. At a minimum, fish and macroinvertebrate sampling should be conducted by the MPCA, Minnesota Department of Natural Resources (MN-DNR), or other agencies every five to ten years during the summer season.

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 MRW TMDLs will be used to inform the selection of implementation activities as part of the MRW WRAPS process. The purpose of the WRAPS report is to support local working groups and jointly develop scientifically-supported restoration and protection strategies to be used for subsequent implementation planning.

MPCA outlined the importance of prioritizing areas within the MRW, education and outreach efforts with local partners, and partnering with local stakeholders to improve water quality within the watershed. The MRW WRAPS document includes additional detail regarding specific recommendations from MPCA to aid in the reduction of bacteria, nutrients, and TSS and to

surface waters of the MRW. Efforts to reduce pollutant loads in the watershed are discussed below.

Pasture management/livestock exclusion plans: Reducing livestock access to stream environments will lower the opportunity for direct transport of bacteria, nutrients and TSS to surface waters. The installation of exclusion fencing near stream and river environments to prevent direct access for livestock, installing alternative water supplies, and installing stream crossings between pastures, would work to reduce the influxes of bacteria and TSS, and erosion of streambanks to improve water quality within the watershed. Additionally, introducing rotational grazing to increase grass coverage in pastures, and maintaining appropriate numbers of livestock per acre for grazing, can also aid in the reduction of bacteria and sediment inputs.

Manure Collection and Storage Practices: Manure has been identified as a source of bacteria. This pollutant can be transported to surface water bodies via stormwater runoff. Bacteria can also leach into groundwater resources. Improved strategies for the collection, storage and management of manure can minimize impacts of bacteria and nutrients entering the surface and groundwater system. Repairing manure storage facilities or building roofs over manure storage areas may decrease the amount of bacteria in stormwater runoff.

Manure management plans: Developing manure management plans can ensure that the storage and application rates of manure are appropriate for land conditions. Determining application rates that take into account the crop to be grown on that particular field and soil type will ensure that the correct amount of manure is spread on a field given the conditions. Spreading the correct amount of manure will reduce the availability of pollutants to migrate to surface waters.

Feedlot runoff controls: Treatment of feedlot runoff via diversion structures, holding/storage areas, and stream buffering areas can all reduce the transmission of pollutants to surface water environments. Additionally, cleaner stormwater runoff can be diverted away from feedlots so as to not liberate bacteria.

Septic Field Maintenance: Septic systems are believed to be a source of bacteria to waters in the MRW. Failing systems are expected to be identified and addressed via upgrades to those SSTS not meeting septic ordinances. MPCA explained that SSTS improvement priority should be given to those failing SSTS on lakeshore properties or those SSTS adjacent to streams within the direct watersheds for each water body. MPCA aims to greatly reduce the number of failing SSTS in the future via local septic management programs and educational opportunities. Educating the public on proper septic maintenance, finding and eliminating illicit discharges, and repairing failing systems could lessen the impacts of septic derived bacteria and nutrient inputs into the MRW.

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 bacteria. Education efforts targeted to the general public are commonly used to provide information on the status of impacted waterways as well as to address pet waste and wildlife issues. Education efforts may emphasize aspects such as cleaning up pet waste or managing the landscape to discourage nuisance congregations of wildlife and

waterfowl. 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.

Identification of Stream, River, and Lakeshore Erosional Areas: MPCA noted that an assessment of stream channel, river channel, and lakeshore erosional areas should be completed to evaluate areas where erosion control strategies could be implemented in the MRW. Implementation actions (e.g., planting deep-rooted vegetation near water bodies to stabilize streambanks) could be prioritized to target areas which are actively eroding. This strategy could prevent additional sediment inputs into surface waters of the MRW and minimize or eliminate degradation of habitat.

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 MRW TMDLs the public was given various opportunities to participate. As part of the strategy to communicate the goals of the TMDL project and to engage with members of the public, MPCA worked with county and WD staff to promote water quality, to gain input from landowners via surveys and interviews and to better understand the social dynamics of stakeholders in the MRW. MPCA's goal was to create civic engagement and discussion which would enhance the content of the TMDL and WRAPS documents.

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 April 12, 2021 and ended on May 12, 2021. MPCA developed an on-line presentation for the public to view during the public notice period, and sent notices and flyers to the public and various stakeholders. MPCA did not receive any comments.

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 Marsh River Watershed TMDLs, the submittal letter and accompanying documentation from MPCA on June 7, 2021. The transmittal letter explicitly stated that the final TMDLs referenced in Table 1 of this Decision Document were 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 watershed 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 CFR 130.

The EPA finds that the TMDL transmittal letter submitted for the Marsh River Watershed TMDLs by MPCA satisfies the requirements of this twelfth element.

13. Conclusion

After a full and complete review, the EPA finds that the bacteria TMDL and the TSS TMDL satisfy all elements for approvable TMDLs. This TMDL approval is for **two (2) TMDLs**, addressing segments for aquatic recreational and aquatic life use impairments (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.

References:

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MPCA. (2018). *Marsh River Stressor Identification Report.* January 2018. wq-ws5-09020107a. Retrieved May 21, 2020, from https://www.pca.state.mn.us/sites/default/files/wq-ws5-09020107a.pdf

MPCA. (2021). *Marsh River WRAPS report. July , 2021.* wq-ws4-83a . Initially prepared by Houston Engineering, Inc. for Wild Rice Watershed District. Retrieved July 12, 2021, from https://www.pca.state.mn.us/sites/default/files/wq-ws4-83a.pdf

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