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

REPLY TO ATTENTION OF

WW-16J

April 7, 2020

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 segments within the Watonwan River Watershed (WRW), including supporting documentation. The WRW encompasses parts of Cottonwood, Brown, Blue Earth, Jackson, Martin, and Watonwan counties in south central Minnesota. The WRW TMDLs address impairments for aquatic recreation and limited resource waters designations due to excessive bacteria and nutrient levels.

The WRW 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 ten (10) *E. coli* TMDLs and four (4) total phosphorus TMDLs. 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 TMDL submissions by the State of Minnesota. If you have any questions, please contact Mr. Colin Geisenhoffer, at 312-886-6744.

Sincerely,

THOMAS SHORT
Digitally signed by THOMAS SHORT
Date: 2020.04.07 15:23:40 -05'00'

Thomas R. Short, Jr.
Acting Director, Water Division

wq-iw7-52g

TMDL: Watonwan River Watershed TMDL, Blue Earth, Brown, Cottonwood, Jackson, Martin, and Watonwan Counties - Minnesota
Date: 04/07/2020

Decision Document for the Approval of the Watonwan River Watershed TMDLs

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

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

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

The TMDL submittal should include an identification of the point and nonpoint sources of the pollutant of concern, including location of the source(s) and the quantity of the loading, e.g., lbs/per day. The TMDL should provide the identification numbers of the NPDES permits within the waterbody. Where it is possible to separate natural background from nonpoint sources, the TMDL should include a description of the natural background. This information is necessary for EPA's review of the load and wasteload allocations, which are required by regulation.

The TMDL submittal should also contain a description of any important assumptions made in developing the TMDL, such as:

(1) The spatial extent of the watershed in which the impaired waterbody is located;
(2) The assumed distribution of land use in the watershed (e.g., urban, forested, agriculture);
(3) Population characteristics, wildlife resources, and other relevant information affecting the characterization of the pollutant of concern and its allocation to sources;
(4) Present and future growth trends, if taken into consideration in preparing the TMDL (e.g., the TMDL could include the design capacity of a wastewater treatment facility); and
(5) An explanation and analytical basis for expressing the TMDL through *surrogate measures,* if applicable. *Surrogate measures* are parameters such as percent fines and turbidity for sediment impairments; chlorophyll-a (chl-a) and phosphorus loadings for excess algae; length of riparian buffer; or number of acres of best management practices.

Comments:

The comments below discuss the waterbodies covered in this TMDL, pollutants of concern in these waterbodies, and Minnesota Pollution Control Agency (MPCA) priority ranking process. This information is found in Sections 1 and 3 of the final Watonwan River Watershed (WRW) TMDL.

Identification of Waterbody

MPCA has submitted TMDLs for the WRW, located in south central Minnesota. The WRW TMDL document outlines the watershed in Sections 1.2 and 3.1-3.5 of the TMDL. Figure 1 of the TMDL shows the location of the WRW within the Minnesota River Watershed. Figure 2 of the TMDL shows the impaired assessment units' locations within the WRW. The WRW is predominantly agricultural with corn/soybean crop rotations. There are no Native American Reservation lands within the WRW.

The WRW TMDL addresses fourteen impairments, four of which are impaired lakes and the remainder are stream/river segments. Tables 1 and 2 of the TMDL list the assessment unit IDs and their impacted designated uses. The assessment units are mainly impaired for aquatic recreation with two failing to meet their limited resource value use. The river impairments are caused by elevated levels of *E. coli* and the lakes are impaired due to eutrophication. See Table 1 below.

Table 1: Watonwan River Watershed Impairments

Impairments Identified in the Watonwan River Watershed TMDL					
Reach Name	**Assessment Unit ID or MN DNR Lake #**	**Year Listed**	**Affected Designated Use**	**Stressor**	**TMDL**
Watonwan River, North Fork	07020010-564	2016	Aquatic Recreation	*Escherichia coli*	*E. coli*
Butterfield Creek	07020010-516	2016	Aquatic Recreation	*Escherichia coli*	*E. coli*
St James Creek	07020010-576	2016	Aquatic Recreation	*Escherichia coli*	*E. coli*
	07020010-502	2016	Limited Value Resource		
	07020010-515	2016			
Judicial Ditch 1	07020010-581	2016	Aquatic Recreation	*Escherichia coli*	*E. coli*
Watonwan River, South Fork	07020010-568	2016	Aquatic Recreation	*Escherichia coli*	*E. coli*
Spring Branch Creek	07020010-574	2016	Aquatic Recreation	*Escherichia coli*	*E. coli*
Perch Creek	07020010-523	2016	Aquatic Recreation	*Escherichia coli*	*E. coli*
Watonwan River	07020010-510	2016	Aquatic Recreation	*Escherichia coli*	*E. coli*
Eagle Lake	17-0020-00	2010	Aquatic Recreation	Eutrophication	Total P
Butterfield Lake	83-0056-00	2016	Aquatic Recreation	Eutrophication	Total P
Kansas Lake	83-0036-00	2016	Aquatic Recreation	Eutrophication	Total P
Bingham Lake	17-0007-00	2010	Aquatic Recreation	Eutrophication	Total P

The WRW TMDL spans approximately 878 square miles and is in the Western Corn Belt Plains ecoregion. The WRW is almost entirely agricultural cropland with corn/soybean rotations. Wetlands are the second most abundant land type in each of the subwatershed with developed area coming in a close third. The combined wetland and developed areas land classifications acreage are less than ten percent of each of the subwatersheds areas. MPCA does not indicate any major future land use change, and references the streamlined process developed with Region 5 EPA for new or expanding MS4 in areas with an existing TMDL.

Pollutants of Concern

MPCA developed fourteen TMDLs to address aquatic recreation and limited resource waters impaired designated uses. Ten *Escherichia coli* (*E. coli*) TMDLs were developed to address impaired streams and four total phosphorus (Total P) TMDLs to address eutrophication-impaired lakes.

E. coli

E. coli and fecal coliform bacteria are indicator organisms usually associated with fecal matter contamination. These organisms can be found in the intestines of warm-blooded animals (humans and livestock). The presence of *E. coli* and fecal coliform bacteria in water suggests the presence of fecal matter associated bacteria, viruses, and protozoa that are pathogenic to humans when ingested. For the waterbodies of the WRW an average fifteen samples were taken to determine impairment status. *E. coli* sampling data collected June through August in 2013 and 2014 for most of the stream reaches. Sites 07020010-515 and 07020010-502 monitored from May through July. *E. coli* exceedances of the monthly geometric mean were found all stream sites. Assessment units 07020010-516 and 07020010-564 also had exceedances of the single daily maximum, with this being exceeded multiple times (Appendix A of the TMDL).

Total Phosphorus (Total P)

Phosphorus is an essential nutrient for aquatic life, but elevated concentrations of Total P can lead to nuisance algal blooms that negatively impact aquatic life and recreation (swimming, boating, fishing, etc.). Excess algae increase turbidity which degrades aesthetics and causes adverse ecological impacts. Algal decomposition depletes oxygen levels stressing aquatic biota (fish and macroinvertebrate species). Oxygen depletion can cause phosphorus release from bottom sediments (i.e. internal loading), which contributes to increased nutrient levels in the water column. Excess phosphorus can alter biological communities by shifting species composition toward organisms better suited to excess levels of phosphorus. Measurements were collected for Total P, chlorophyll α, and secchi disk transparency from June through September for the years 2005 through 2016. All parameters were exceeded (Appendix A of the TMDL).

Pollutant Sources

The pollutant loads in the WRW are primarily attributed to nonpoint sources with some loading coming from wastewater treatment plants, and a minimal amount from construction and industrial stormwater sources. There are also permitted CAFOs and AFOs which have been assigned a zero waste load allocation. MPCA also indicates that there are "natural" sources of *E. coli* loading in the TMDL area. The pollutants and their corresponding sources are broken out below. Overall there are 100 permitted facilities. (Tables 5, 6, and 7 of this Decision Document).

E. coli

MPCA identified several potential sources of *E. coli* within the watershed (see Section 3.6.2 of the WRW TMDL). The bulk of the land use in the watershed is agricultural, therefore the majority of the risk is assumed by MPCA to be contamination from livestock and manure application on cropland. The State-permitted AFOs are expected to have zero discharge and therefore not considered a source of loading. However, there are over 300 small unregulated AFOs that may be significant sources of pollutant loading. Loading can be attributed to failed manure containment, runoff from feedlots, and runoff from manure that is land applied. Additional animal related contamination may come from pet waste runoff and from wildlife scat. Human sources from straight pipe/failing septic systems are also a potential source of contamination, but MPCA has indicated that there are few of these in the watershed. In addition to SSTS, there are ten wastewater treatment facilities, but these are presumed by MPCA to be a minor source of the overall loading.

Point sources
Wastewater Treatment Facilities (WWTFs) – NPDES permitted facilities may contribute bacteria loads to surface waters through discharges of treated wastewater. Permitted facilities must discharge treated wastewater according to their NPDES permit. MPCA determined that there are ten WWTF in the WRW which contribute bacteria from treated wastewater releases (Table 5 of this Decision Document) to segments impaired by bacteria. MPCA assigned each of these facilities a portion of the bacteria wasteload allocation (WLA).

Concentrated Animal Feedlot Operations (CAFOs) – MPCA identified 77 CAFOs in the WRW (Appendix D of the TMDL and Table 6 of this Decision Document). CAFO facilities must be designed to contain all surface water runoff from the production facilities (i.e., have zero discharge from their facilities) and have a current manure management plan. MPCA explained that these facilities do not discharge effluent and therefore were not assigned a portion of the WLA (WLA = 0).

Municipal Separate Storm Sewer System (MS4) communities – There are no current regulated MS4 communities within the WRW.

Combined Sewer Overflows (CSOs) and Sanitary Sewer Overflows (SSOs) – There are no CSOs or known occurances of SSOs in WRW.

Nonpoint sources
Nonpermitted Medium and Small Animal Feeding Operations (AFOs) – Animal operations in close proximity to surface waters can be a source of bacteria to waterbodies in the WRW. These areas may contribute bacteria via the mobilization and transportation of pollutant laden waters from feeding, holding and manure storage sites. These sites are not regulated under the NPDES CAFO permit program, or under state AFO regulations. Runoff from agricultural lands may contain significant amounts of bacteria which could lead to impairments in the WRW. Feedlots generate manure which may be spread onto fields as fertilizer. Manure runoff from fields can be exacerbated by tile drainage lines that channelize the stormwater flows and reduce bacteria die-off potential. Additionally, unrestricted livestock access to streams in pasture areas can add bacteria directly to the surface waters or resuspend bacteria laden sediment that had settled on the stream bottom. Direct deposition of animal wastes can result in 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.

State Permitted AFOs – MPCA identified 13 AFOs in the WRW (Appendix D of the TMDL and Table 7 of this Decision Document). State permitted AFO facilities must be designed to contain all surface water runoff from the production facilities (i.e., have zero discharge from their facilities) and have a current manure management plan. MPCA explained that these facilities do not discharge effluent and therefore were not assigned a portion of the LA (LA = 0).

SSTS or Unsewered Communities – Failing septic systems are a potential source of bacteria within the WRW. Septic systems generally do not discharge directly into a waterbody, 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 bacteria contribution from these systems. Furthermore, 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. MPCA indicated that there are relatively few SSTSs within an individual assessment unit's watershed in the WRW.

Wildlife and Pets – Wildlife is a known source of bacteria in waterbodies as many animals spend time in or around waterbodies. Deer, geese, ducks, raccoons, and other animals all create potential sources of bacteria. Wildlife contributes to the potential impact of contaminated runoff from animal habitats, such as urban park areas, forest, and rural areas. Animal impact can be exacerbated in urban areas with high pet populations and a lack of sanitary disposal of pet waste.

Total P

MPCA identified several sources as contributing phosphorus loading to the nutrient impairments for the four impaired lakes within the WRW, including: agricultural areas; internal loading; and atmospheric deposition. Stormwater from industrial and construction sites is the only potential point source in the lake subwatershed; there are no MS4s or WWTFs, and MPCA did not indicate that any of the CAFOs or State-permitted AFOs are within these subwatersheds. MPCA does not identify a specific source as being the primary contributor to loading but modeled heavy reduction in internal loading for three of the four lakes. Details on these specific sources can be found below.

Point sources

Stormwater from Construction – Erosion from construction sites may contribute sediment to a waterway if the stormwater is untreated. This sediment may have phosphorus sorbed to the sediment particles and in turn be a source of phosphorus in the WRW.

Nonpoint sources

Manure and Fertilizer Application – Runoff from agricultural lands may contain significant amounts of nutrients, organic material and organic-rich sediment which may contribute to impairments in the WRW. Manure spread onto fields is often a source of phosphorus, and can be exacerbated by tile drainage lines, which channelize the stormwater. Tile lined fields and channelized ditches enable particles to move more efficiently into surface waters. Stormwater field runoff may contribute nutrients and organic-rich sediment to surface waters from livestock manure, fertilizers, vegetation and erodible soils. Additionally, stormwater from AFO feedlots can be high in nutrients. Furthermore, livestock with direct access to a waterway can directly deposit nutrients via animal wastes into a waterbody, which may result in very high localized nutrient concentrations.

Internal Loading – When phosphorus inputs are greater than the in lake biological needs and phosphorus input is greater than export it can build up in lake sediment. This phosphorus then can be directly leached from sediments, released though physical disturbance from benthic fish (rough fish, ex. carp), released by mixing of the water column, low dissolved oxygen levels and from decaying curly-leaf pondweeds. The BATHTUB models for this TMDL showed that internal loading of phosphorus, was a major contributor of Total P loading for most of the impaired lakes, requiring substantial reductions.

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 WRW. Phosphorus can be bound to these particles which may add to the phosphorus inputs to surface water environments.

SSTS or Unsewered Communities– Septic systems generally do not discharge directly into a waterbody, 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. MPCA indicated that there are relatively few SSTSs within an individual assessment unit's watershed in the WRW.

Erosion and Channel Destabilization – Overland erosion of sediment can be a major source of Total P for the above reasons. Furthermore, 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 intensify 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. This problem can be exacerbated by livestock with direct access to stream environments, which may add nutrients directly to the surface waters or resuspend particles that had settled on the stream bottom. MPCA did not directly identify channel and near stream erosion as a source of Total P for the lakes, but indicated that there is work being done in the watershed to address this potential source.

Priority Ranking

The waterbodies addressed by the WRW TMDLs were given a priority ranking for TMDL development due to the public value of the impaired water resources, the likelihood of completing the TMDL in an expedient manner, and Minnesota's TMDL Priority Framework[1]. Areas within the WRW are popular locations for aquatic recreation. Water quality degradation has led to efforts to improve the overall water quality within the WRW, and to the development of TMDLs for these waterbodies. This framework explains how TMDL development priorities were prioritized to align with its Statewide watershed monitoring approach and its 10-year Watershed Restoration and Protection Strategies (WRAPS) schedule. The assessment units addressed in this TMDL are found in the 2016 303(d) list of impaired waterbodies.

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 waterbody, the applicable numeric or narrative water quality criterion, and the antidegradation policy (40 C.F.R. §130.7(c)(l)). EPA needs this information to review the loading capacity determination, and load and wasteload allocations, which are required by regulation.

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

---

[1] Prioritization Plan for Minnesota 303(d) Listings to Total Maximum Daily Loads
Minnesota Pollution Control Agency https://www.pca.state.mn.us/sites/default/files/wq-iw1-54.pdf

chosen numeric water quality target.

Comments:
The WRW TMDL addresses fourteen impaired use designations with TMDLs. Twelve TMDLs address impaired segments not meeting the aquatic use recreation designations and two TMDLs address segments not meeting the limited resource value use (Tables 1 and 2 of the TMDL). Section 2 of the TMDL lists the applicable water quality standards (WQS) for the impaired waterbodies. The impaired assessment units are shown in Figure 2 of the TMDL. Table 1 of this Decision Document also lists these impairments and their associated pollutants.

Designated Use

WQS are the fundamental benchmarks by which the quality of surface waters is 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. See Section 2 of the TMDL.

Minnesota Rule Chapter 7050 designates uses for waters of the state. Twelve of the assessment units addressed by the WRW TMDL are designated as Class 2 waters for aquatic recreation use (fishing, swimming, boating, etc.) and aquatic life use. The Class 2 designated use is as follows:

> "*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.*"[2]

Minnesota Rule Chapter 7050 designates uses for waters of the state. Two of the assessment units addressed by the WRW TMDL are designated as Class 7 waters or waters of limited resource value. The Class 7 designated use is as follows:

> "*Limited resource value waters include surface waters of the state that have been subject to a use attainability analysis and have been found to have limited value as a water resource. Water quantities in these waters are intermittent or less than one cubic foot per second at the 7Q10 flow as defined in part 7050.0130, subpart 3. These waters shall be protected so as to allow secondary body contact use, to preserve the groundwater for use as a potable water supply, and to protect aesthetic qualities of the water. It is the intent of the agency that very few waters be classified as limited resource value waters. The use attainability analysis must take into consideration those factors listed in Minnesota Statutes, section 115.44, subdivisions 2 and 3. The agency, in cooperation and agreement with the Department of Natural Resources with respect to determination of fisheries values and potential, shall use this information to determine the extent to which the waters of the state demonstrate that:*
>
> *A. the existing and potential faunal and floral communities are severely limited by natural conditions as exhibited by poor water quality characteristics, lack of habitat, or lack of water;*

[2] Use classification 2 waters (Minn. R. 7050.0140, Subp 3)

B. the quality of the resource has been significantly altered by human activity and the effect is essentially irreversible; or

C. there are limited recreational opportunities, such as fishing, swimming, wading, or boating, in and on the water resource.

The conditions in items A and C or B and C must be established by the use attainability analysis before the waters can be classified as limited resource value waters."[3]

Narrative Criteria

Eight of the streams and rivers are listed as impaired for aquatic recreation and/or aquatic life use and their designated as Class 2A waters. The applicable narrative criteria states:

"The quality of class 2A surface waters shall be such as to permit the propagation and maintenance of a healthy community of cold water sport or commercial fish and associated aquatic life, and their habitats. These waters shall be suitable for aquatic recreation of all kinds, including bathing, for which the waters may be usable. This class of surface waters is also protected as a source of drinking water. Abbreviations, acronyms, and symbols are explained in subpart 1."[4]

Two of the streams and rivers are listed as impaired for their limited resource value waters use. These waters are Class 7 waters of the state. The applicable narrative criteria states:

"The quality of class 7 waters of the state shall be such as to protect aesthetic qualities, secondary body contact use, and groundwater for use as a potable water supply."[5]

The lakes are listed as impaired for aquatic recreation use. The lakes are in the Western Corn Belt Plains Ecoregion and meet the class 2B Shallow Lakes designation. The applicable narrative criteria states:

"The quality of class 2B surface waters shall be such as to permit the propagation and maintenance of a healthy community of cool or warm water sport or commercial fish and associated aquatic life and their habitats. These waters shall be suitable for aquatic recreation of all kinds, including bathing, for which the waters may be usable. This class of surface waters is also protected as a source of drinking water. The applicable standards are given below. Abbreviations, acronyms, and symbols are explained in subpart 1."[6]

Table 2: Minnesota Water Quality Standards - Numeric Criterion

Applicable Water Quality Standards				
Parameter	**Water Quality Standard**	**Units**	**Criteria**	**Applicable Time Period**
Escherichia coli - Class 2 streams	Not to exceed 126	org/100 mL	Monthly geometric mean of a least 5 samples within one calendar year	April 1st – October 31st

[3] Use classification 7 waters (Minn. R. 7050.0140, subp 8)
[4] Narrative criteria class 2A waters (Minn. R. 7050.0222, subp. 2.)
[5] Narrative criteria class 7 waters (Minn. R. 7050.0227, subp. 2.)
[6] Narrative criteria class 2B waters (Minn. R. 7050.0222, subp. 3.)

	Not to exceed 1,260	org/100 mL	Monthly upper 10th percentile	
Escherichia coli - Class 7 streams	Not to exceed 630	org/100 mL	Monthly geometric mean of a least 5 samples within one calendar year	May 1st – October 31st
	Not to exceed 1,260	org/100 mL	No more than 10% of total samples	
Total P - Western Corn Belt Plains Ecoregion 2B Shallow Lakes	Less than 90	P µg/L	Concentration should not exceed	June 1st – September 30ith
	Less than 30	Chlorophyll-α µg/L	Concentration should not exceed	
	Greater than or equal to 0.7	meters	Secchi depth measurement should exceed	

E. coli

The applicable numeric criteria for the waters of the WRW are in Table 2 of this Decision Document. The focus of this TMDL is on the 126 organisms (orgs) per 100 mL (126 orgs/100 mL) geometric mean portion of the standard for the class 2 waters and the 630 organisms per 100 mL portion of the class 7 standard. For the older listed impairments, MPCA assumed that meeting the *E. coli* standard will also achieve the fecal coliform limit. Additionally, MPCA determined that using the geometric mean portions of the standards will result in the greatest bacteria reductions within the WRW and will also result in the attainment the maximum portion of the standard. While the bacteria TMDLs will focus on the geometric mean portion of the water quality standard, attainment of both criteria of the water quality standard is required.

Total P

Numeric criteria for Total P, chlorophyll-*a*, and Secchi Disk (SD) depth in lakes are set forth in Minnesota Rules 7050.0222. These three parameters form MPCA eutrophication standard that must be achieved to attain the aquatic recreation designated use. The numeric eutrophication standards which are applicable to the WRW lake TMDLs are found in Table 2 of this Decision Document. By evaluating multiple lakes in multiple ecoregions, MPCA has determined that achieving these phosphorus targets will also achieve the targets for SD depth and chlorophyll-*a*.[7]

MPCA indicated that there is a clear causal relationship between Total P, and the response variables, chl-*a* and Secchi depth. Therefore, MPCA anticipates that by meeting the Total P concentration of less than 90 µg/L will sufficiently address all other parameters, achieving their designated beneficial uses. For lakes to achieve their 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 experiencing minimal nuisance algal blooms and exhibiting desirable water clarity.

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

---

[7] Minnesota Lake Water Quality Assessment report: Developing Nutrient Criteria (September 2005) – https://www.pca.state.mn.us/sites/default/files/lwq-a-nutrientcriteria.pdf

criterion.

3. Loading Capacity - Linking Water Quality and Pollutant Sources

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

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

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

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

Comment:

Functionally a TMDL is represented by the equation:

$$TMDL = LC = \Sigma WLA + \Sigma LA + MOS + RC,$$

where: LC is the loading capacity; WLA is the wasteload allocation; LA is the load allocation; MOS is the margin of safety; and (pursuant to MPCA rules) RC is any reserve capacity set aside for future growth. In the WRW TMDL MPCA did not set aside any RC as they do not anticipate future growth in the WRW. MPCA calculated a countywide population change of only a half percent over the last five years. The TMDLs for the WRW can be broken down into three different approaches two of which utilize a Hydrologic Simulation Program FORTRAN (HSPF) model to determine inflow to the assessment unit and the other is based on direct flow gage data. The four lake TMDLs and nine of the stream TMDLs use HSPF modeled data as inputs to the TMDL models. All of the stream TMDLs use the load duration curve (LDC) methods and the Lake TMDLs use the BATHTUB model for their calculations. Details on these models, the LDC process, and specifics related to pollutants of concern (including the TMDL tables) can be found in the sections below and in Section 4 and Appendices A-D of the TMDL.

HSPF

HSPF is a comprehensive modeling package used to simulate watershed hydrology and water quality on a basin scale. The package includes both an Agricultural Runoff Model and a more general nonpoint source model. HSPF parametrizes numerous hydrologic and hydrodynamic processes to determine flow rate, sediment, and nutrient loads. HSPF uses continuous meteorological records to create hydrographs, and to estimate time series pollution concentrations.[8,9] The output of the HSPF process is a model of multiple HRUs, or subwatersheds of the overall WRW. The WRW HSPF model validation used data from the site near Garden City, Minnesota (Hydstra ID 31051001). The model was validated with data from 1995-2002. The flows generated from the model were used to develop a flow duration curve, when monitoring gage values were not available.

BATHTUB

MPCA used the U.S. Army Corps of Engineers (USACE) BATHTUB model to calculate the loading capacities for the lake TMDLs. BATHTUB is a model for lakes and reservoirs (surficial depressions with retention times greater than two weeks) to determine "steady-state water and nutrient mass balances in a spatially segmented hydraulic network". BATHTUB uses empirical relationships to determine "eutrophication-related water quality conditions".[10] These TMDLs use the BATHTUB model to link observed phosphorus water quality conditions and modeled phosphorus loading to in-lake water quality values. BATHTUB can be a steady-state annual or seasonal model that predicts a lake's water quality. BATHTUB utilizes annual or seasonal time-scales which are appropriate because watershed Total P loads are normally impacted by seasonal conditions.

BATHTUB has built-in statistical calculations which account for data variability and provide a means for estimating confidence in model predictions. BATHTUB employs a mass-balance Total P model that accounts for water and Total P inputs from tributaries, direct watershed runoff, the atmosphere, sources internal to the lake, outputs through the lake outlet, water loss via evaporation, and Total P sedimentation and retention in the lake sediments. BATHTUB allows the user the choice of several different mass-balance Total P models for estimating loading capacity. Additionally, BATHTUB provides flexibility to tailor model inputs to specific lake morphometry, watershed characteristics and watershed inputs. The BATHTUB model also allows MPCA to assess impacts of changes in nutrient loading from the various sources.

The model equations were originally developed US Army Corps of Engineers (USACE) from data taken from over 40 lakes. The model estimates in-lake phosphorus concentration by calculating net phosphorus loss (phosphorus sedimentation) from annual phosphorus loads as functions of inflows to the lake, lake depth, and hydraulic flushing rate. To estimate loading capacity the model is rerun, reducing current loading to the lake until the modeled result shows that in-lake total phosphorus would meet the applicable WQS.[11]

For the WRW Total P TMDLs the BATHTUB process was used to calculate the loading capacity for each lake. The loading capacity is the maximum phosphorus load which each of these waterbodies can receive over an annual period and still meet the shallow and general lake nutrient WQS. Loading capacities were calculated to meet the WQS during the growing season (June 1 through September 30). This time period contains the months that the general public typically use lakes in the WRW for aquatic recreation. This time of the year also corresponds to the growing season when water quality is likely to be impaired by excessive nutrient loading.

Loading for the lakes watershed and internal loading are modeled with BATHTUB, using the greater watershed HSPF model and observed in-lake data. The watershed input and internal loading portions of

---

[8] HSPF User's Manual - https://water.usgs.gov/software/HSPF/code/doc/hspfhelp.zip
[9] EPA TMDL Models Webpage - https://www.epa.gov/exposure-assessment-models/tmdl-models-and-tools
[10] BATHTUB Manual - http://www.wwwalker.net/bathtub/help/bathtubWebMain.html
[11] BATHTUB Manual - http://www.wwwalker.net/bathtub/help/bathtubWebMain.html

the BATHTUB model are then adjusted until the in-lake WQS target is achieved. This finalized BATHTUB model is then used to determine the WLA, LA, and MOS portions of the TMDL. As the model developed is on an annual basis, loading capacities were divided by 365 to calculate the daily loading capacities.

Loading capacities for atmospheric deposition, the watershed (tributary point and nonpoint sources), and internal loading were determined using inputs from the HSPF model and observed in-lake data. The watershed input and internal loading portions of the BATHTUB model are then adjusted until the in-lake WQS target is achieved. The watershed loading portion of this model was then further reduced by the MOS to account for uncertainty in the model. This finalized BATHTUB model contains the WLA, LA, and MOS portions of the TMDL. The model is developed on an annual basis so loading capacities were divided by 365 to calculate the daily loading capacities.

EPA concurs with use of HSPF and BATHTUB to determine loading capacities, wasteload allocations, load allocations and the margin of safety for the Total P TMDLs.

LDC

Flow Duration Curve (FDC) graphs have flow duration interval (percentage of time flow exceeded) on the X-axis and discharge (flow per unit time) on the Y-axis. For the WRW TMDLs FDCs were generated from the spatially relevant flow generated by their HSPF HRUs, or in the case of the Watonwan River assessment unit by an area weighted flow measure from the MPCA/DNR gage 31051001. When data from the gage was not available the HSPF modeled flows were utilized. The FDC were transformed into LDC by multiplying individual flow values by the WQS and then multiplying that value by a conversion factor. The resulting points are plotted onto a LDC graph. LDC graphs, have flow duration interval (percentage of time flow exceeded) on the X-axis and the pollutant load (or count of colonies for *E. coli*) on the Y-axis. The curved line on a LDC graph represents the TMDL of the respective flow conditions observed at that location.

Water quality monitoring was completed in the WRW and measured pollutant 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. The individual sampling loads were plotted on the same figure with the created LDC. Individual LDCs are found in Appendix A of the TMDL document.

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 that plot above the LDC represent violations of the WQS for those flow conditions. The difference between individual sampling loads plotted above the LDC and the LDC, measured at the same flow, is the amount of reduction necessary to meet WQS.

The LDC TMDL tables in this Decision Document report 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 pollutant monitoring data and allows for the estimation of load reductions necessary for attainment of the appropriate WQS. Using this method, daily loads were developed based upon the flow in the waterbody. Loading capacities were determined for the segment from multiple flow regimes. This creates a TMDL that represents the allowable daily load across all flow conditions. The TMDL tables identify the loading capacity for the waterbody at each flow regime. Although there are numeric loads for each flow regime, the LDC is what is being approved as a TMDL.

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, MPCA believes and EPA concurs that the strengths outweigh the weaknesses for the LDC method. The LDC approach is useful in determining loading capacities, wasteload allocations, load allocations and the margin of safety for *E. coli* and TSS TMDLs. The methods used are consistent with U.S. EPA technical memos.[12]

E. coli

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 instead, *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".[13] To establish the loading capacities for the WRW *E. coli* TMDLs, MPCA used Minnesota's WQS for *E. coli* (in orgs/mL). A loading capacity is, "the greatest amount of loading that a water can receive without violating water quality standards."[14] 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 waterbody. If all sources meet the WQS at discharge, then the waterbody should meet the WQS and the designated use.

MPCA uses the geometric mean for *E. coli* counts to calculate loading capacity values for the *E. coli* TMDLs (126 orgs/100 mL or 630 orgs/100 mL). 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 WQS for Coastal and Great Lakes Recreation Waters Final Rule", "…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."[15] MPCA stated that the *E. coli* TMDLs will focus on the geometric mean portion of the WQS (126 orgs/100 mL or 630 orgs/100 mL) and that it expects that by attaining the geometric mean portion of the *E. coli* WQS the single sample portion of the *E. coli* WQS will also be attained. EPA finds these assumptions to be reasonable.

In addition, to using the geometric mean MPCA structures its WQS to reflect when the highest potential for contact occurs (spring though summer). By targeting this critical exposure period MPCA can achieve the greatest overall protection. A review of historical data indicate that *E. coli* loading is a problem for

---

[12] An Approach for Using Load Duration Curves in the Development of TMDLs https://www.epa.gov/sites/production/files/2015-07/documents/2007_08_23_tmdl_duration_curve_guide_aug2007.pdf
[13] 40 CFR §130.2
[14] 40 CFR §130.2
[15] 69 FR 67218-67243 (November 16, 2004) – https://www.gpo.gov/fdsys/pkg/FR-2004-11-16/html/04-25303.htm

the entire flow regime for all of the stream TMDLs.

EPA supports the data analysis and modeling approach used by MPCA in its calculation of wasteload allocations, load allocations, and the margin of safety for the WRW *E. coli* TMDLs. Additionally, EPA concurs with the loading capacities calculated by MPCA in the ten *E. coli* TMDLs. EPA finds MPCA's approach for calculating the loading capacity to be reasonable and consistent with EPA guidance.

The TMDL tables for all of the *E. coli* TMDLs are found below and in Appendix A of the TMDL document.

E. coli TMDL Tables

Table 3: Bacteria (*E. coli*) TMDLs for the Watonwan River Watershed

Allocation	Source	Very High	High	Mid	Low	Very Low
		E. coli (billions of organisms/day)				
TMDL for Watonwan River North Fork (07020010-564)						
Wasteload Allocation	***WLA Totals***	0.000	0.000	0.000	0.000	0.000
Load Allocation	Watershed load	233.000	49.000	17.000	6.800	1.700
	LA Totals	233.000	49.000	17.000	6.800	1.700
Margin of Safety (10%)		26.000	5.400	1.900	0.750	0.190
Loading Capacity (TMDL)		**259.000**	**54.400**	**18.900**	**7.550**	**1.890**
TMDL for Butterfield Creek (07020010-516)						
Wasteload Allocation	Butterfield WWTP (MN0022977)	13.213	13.213	13.213	*	*
	WLA Totals	13.213	13.213	13.213	-	-
Load Allocation	Watershed load	208.000	50.000	11.000	ф	ф
	LA Totals	208.000	50.000	11.000	-	-
Margin of Safety (10%)		25.000	7.000	2.700	1.00	0.22
Loading Capacity (TMDL)		**246.213**	**70.213**	**26.913**	**10.00**	**2.20**
TMDL for St James Creek (07020010-576)						
Wasteload Allocation	***WLA Totals***	0.0	0.0	0.0	0.0	0.0
Load Allocation	Watershed load	137.000	41.000	18.000	8.800	4.800
	LA Totals	137.000	41.000	18.000	8.800	4.800
Margin of Safety (10%)		15.000	4.500	2.000	1.000	0.530
Loading Capacity (TMDL)		**152.000**	**45.500**	**20.000**	**9.800**	**5.330**
TMDL for St James Creek (07020010-502)						
Wasteload Allocation	Saint James WWTP (MN0024759)†	14.119	14.119	14.119	14.119	14.119
	WLA Totals	14.119	14.119	14.119	14.119	14.119
Load Allocation	Watershed load	1112.000	322.000	134.000	58.000	25.000
	LA Totals	1112.000	322.000	134.000	58.000	25.000
Margin of Safety (10%)		125.000	37.000	16.000	8.000	4.300

Loading Capacity (TMDL)		**1251.119**	**373.119**	**164.119**	**80.119**	**43.419**
TMDL for St James Creek (07020010-515)						
Wasteload Allocation	Butterfield WWTP (MN0022977)	13.213	13.213	13.213	13.213	13.213
	Saint James WWTP (MN0024759)†	14.119	14.119	14.119	14.119	14.119
	WLA Totals	27.332	27.332	27.332	27.332	27.332
Load Allocation	Watershed load	2224.000	633.000	249.000	93.000	24.000
	LA Totals	2224.000	633.000	249.000	93.000	24.000
Margin of Safety (10%)		250.000	73.000	31.000	13.000	5.700
Loading Capacity (TMDL)		**2501.332**	**733.332**	**307.332**	**133.332**	**57.032**
TMDL for Judicial Ditch 1 (07020010-581)						
Wasteload Allocation	Neuhof Hutterian Brethren (MNG580113)	0.553	0.553	0.553	0.553	0.553
	WLA Totals	0.553	0.553	0.553	0.553	0.553
Load Allocation	Watershed load	183.000	41.000	16.000	5.100	0.530
	LA Totals	183.000	41.000	16.000	5.100	0.530
Margin of Safety (10%)		20.000	4.600	1.800	0.600	0.120
Loading Capacity (TMDL)		**203.553**	**46.153**	**18.353**	**6.253**	**1.203**
TMDL for Watonwan River - South Fork (07020010-568)						
Wasteload Allocation	***WLA Totals***	0.000	0.000	0.000	0.000	0.000
Load Allocation	Watershed load	151.000	35.000	13.000	4.100	0.690
	LA Totals	151.000	35.000	13.000	4.100	0.690
Margin of Safety (10%)		17.000	3.900	1.400	0.450	0.077
Loading Capacity (TMDL)		**168.000**	**38.900**	**14.400**	**4.550**	**0.767**
TMDL for Spring Branch Creek (07020010-574)						
Wasteload Allocation	Lewisville WWTP (MN0065722)†	2.223	2.223	2.223	2.223	*
	WLA Totals	2.223	2.223	2.223	2.223	-
Load Allocation	Watershed load	332.000	69.000	23.000	5.200	ϕ
	LA Totals	332.000	69.000	23.000	5.200	-
Margin of Safety (10%)		37.000	7.900	2.800	0.820	0.120
Loading Capacity (TMDL)		**371.223**	**79.123**	**28.023**	**8.243**	**1.200**
TMDL for Perch Creek (07020010-523)						
Wasteload Allocation	Truman WWTP (MN0021652)†	3.721	3.721	3.721	3.721	*
	Lewisville WWTP (MN0065722)†	2.223	2.223	2.223	2.223	*
	WLA Totals	5.944	5.944	5.944	5.944	-
Load Allocation	Watershed load	1230.000	262.000	93.000	23.000	ϕ
	LA Totals	1230.0	262.000	93.000	23.000	0.000

Margin of Safety (10%)		137.0	30.000	11.000	3.200	0.540
Loading Capacity (TMDL)		**1,372.944**	**297.944**	**109.944**	**32.144**	**5.400**
TMDL for Watonwan River (07020010-510)						
Wasteload Allocation	Butterfield WWTP (MN0022977)	13.213	13.213	13.213	13.213	*
	Delft Sanitary District WWTP (MN0066541)	0.029	0.029	0.029	0.029	*
	La Salle WWTP (MN0067458)	0.072	0.072	0.072	0.072	*
	Madelia WWTP (MN0024040)	6.268	6.268	6.268	6.268	*
	Mountain Lake WWTP (MNG580035)	19.662	19.662	19.662	19.662	*
	Neuhof Hutterian Brethren (MNG580113)	0.553	0.553	0.553	0.553	*
	Odin-Ormsby WWTP (MN0069442)	1.431	1.431	1.431	1.431	*
	Saint James WWTP (MN0024759)†	14.119	14.119	14.119	14.119	*
	WLA Totals	55.347	55.347	55.347	55.347	-
Load Allocation	Watershed load	3900.000	993.000	264.000	26.000	ϕ
	LA Totals	3900.000	993.000	264.000	26.000	-
Margin of Safety (10%)		439.000	117.000	36.000	9.000	2.200
Loading Capacity (TMDL)		**4394.347**	**1165.347**	**355.347**	**90.347**	**22.000**

*Permitted design flow exceeds LC. WLA is instead calculated by the equation WLA = flow contribution from a given source x 126 org E. coli/100 mL, ensuring that WLA does not exceed LC for these flows.

ϕStreamflow at these flow regimes are point source dominated, therefore, any LA is assumed to be proportional to the WQS concentration.

†WLA is applicable from May-Oct all others are applicable from April-Oct.

Total P

MPCA modeled Total P loading capacity with the BATHTUB model where WLA and watershed load allocation were modeled as watershed loading and atmospheric deposition and internal loading were directly modeled. These calculations were done for the lake's critical conditions, the summer growing season, when water quality in each lake is most likely to be degraded and phosphorus loading inputs are the greatest. Therefore, the resulting allocations will protect the WRW lakes during the time of the year with the highest potential for degraded water quality. MPCA also assumes that the loading capacities established by the TMDL will be protective of water quality during the remainder of the calendar year (October through May). Minnesota reflects this assumption with its targeted WQS approach for the months of June through September. In addition to the allocations being set for the summer months and Minnesota's WQS reflecting this period, the BATHTUB model is calibrated to the summer growing season.

MPCA calibrated the BATHTUB models with a minimum of one year of in-lake phosphorus data (lake data from 2005 through 2015). See Tables A-1, A-10, A-13, and A-25 of the TMDL for summaries of the calibration data. MPCA used these calibrated models to determine the proportional loading for the WRW Total P TMDLs. This data was provided in the form of tributary inflow (watershed loading), precipitation (atmospheric loading), and internal load. The watershed and internal loading portions were reduced until the modeled results obtained the Western Corn Belt Plains Ecoregion 2B Shallow Lakes total P criterion. MPCA then used these values to develop the TMDL. The WLA was then removed from the tributary pool. This reduced tributary loading was then combined with the internal loading pool, and further reduced by 10% of the overall lakes loading capacity to account for the explicit margin of safety. The precipitation pool was then combined with this tributary/internal loading pool to determine the overall LA.

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 WRW phosphorus TMDLs. Additionally, EPA concurs with the loading capacities calculated by MPCA in these four Total P TMDLs. EPA finds MPCA's approach for calculating the loading capacity to be reasonable and consistent with EPA guidance.

The TMDL tables for the Total P TMDLs are found below and in Section 4.3.2 of the TMDL.

Total P TMDL Tables

Table 4: Total Phosphorus TMDLs for the Watonwan River Watershed

Allocation	Source	TP Load	
		(lbs/yr)	*(lbs/day)*
TMDL for Eagle Lake (17-0020-00)			
Wasteload Allocation	Construction and Industrial Stormwater (MNR100001 and MNR050000)	0.365	0.001
	WLA Totals	***0.365***	***0.001***
Load Allocation	***LA Totals***	***272.0***	***0.745***
Margin of Safety (10%)		30.30	0.083
Loading Capacity (TMDL)		**302.7**	**0.829**
Existing Load		**735.0**	**2.01**
TMDL for Butterfield Lake (83-0056-00)			
Wasteload Allocation	Construction and Industrial Stormwater (MNR100001 and MNR050000)	0.0927	0.000254
	WLA Totals	***0.0927***	***0.000254***
Load Allocation	***LA Totals***	***185.88***	***0.509***
Margin of Safety (10%)		20.60	0.0564
Loading Capacity (TMDL)		**206.6**	**0.566**

	Existing Load	**222.0**	**0.608**
TMDL for Kansas Lake (83-0036-00)			
Wasteload Allocation	Construction and Industrial Stormwater (MNR100001 and MNR050000)	0.890	0.00244
	WLA Totals	***0.890***	***0.00244***
Load Allocation	***LA Totals***	***1778***	***4.871***
	Margin of Safety (10%)	198.0	0.5425
	Loading Capacity (TMDL)	**1,977**	**5.416**
	Existing Load	**4,754**	**13.03**
TMDL for Bingham Lake (17-0007-00)			
Wasteload Allocation	Construction and Industrial Stormwater (MNR100001 and MNR050000)	1.39	0.004
	WLA Totals	***1.39***	***0.004***
Load Allocation	***LA Totals***	***1034***	***2.832***
	Margin of Safety (10%)	115	0.315
	Loading Capacity (TMDL)	**1,150**	**3.151**
	Existing Load	**2,905**	**7.960**

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

4. Load Allocations (LAs)

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

Comment:

MPCA determined the LA calculations for each of the TMDLs based on the applicable WQS. MPCA further acknowledged that LAs for each of the individual TMDLs addressed by the WRW TMDLs can be attributed to various nonpoint sources. MPCAs' LA methodology in the WRW was to address nonpoint sources by their pollutant of concern, and not by individual source. The LA for the TMDLs was calculated by summing the WLA and MOS, and assigning the remaining concentrations to the LA.

E. coli

The calculated LA values for the *E. coli* TMDLs are applicable across all flow conditions in the WRW. MPCA identified several nonpoint sources which contribute bacteria loads to the surface waters of the WRW including: stormwater from agricultural and feedlot areas; wildlife/pets; and "natural background". The TMDL did not provide specific estimates for these sources, nor did it indicate which source is likely the greatest contributor.

As stated above MPCA did not determine individual load allocation values for each of these potential nonpoint sources, and instead simply aggregated all nonpoint sources into a categorical LA value. This includes the background *E. coli* levels that MPCA has attributed to naturalized populations, but did not separately calculate a value for this loading.

Total P

The calculated LA values for the Total P TMDLs are applicable to the corresponding summer growing season. MPCA identified several nonpoint sources which contribute Total P loads to the surface waters in the WRW. Load allocations were recognized as originating from: agricultural and feedlot stormwater (manure, fertilizer, erosion of soils); internal loading; and atmospheric deposition. Streambank stabilization is a proposed mitigation practice for agricultural lands indicating that it too may be a source of phosphorus loading.

Although MPCA did not further subdivide the LA, MPCA modeled tributary (watershed loading), internal loading, and loading from precipitation (atmospheric deposition) separately within their BATHTUB model. These models indicate a substantial amount of internal loading reduction are needed for Eagle, Bingham, and Kansas Lakes. The BATHTUB models indicate that Eagle and Bingham need roughly a 70% reduction in internal loading to achieve water quality standards Kansas Lake is modeled to need about a 90% reduction. These three lakes are also modeled to have a 40% reduction in the LA portion of the watershed loading to meet standards. Butterfield Lake appears to be less impaired and is modeled to need only about a 20% reduction in watershed loading and about a 10% reduction from the internal loading.

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 has indicated that the WRW impairments are primarily due to contributions from nonregulated sources. The point sources identified below contribute to overall loading, but not at levels above criteria.

Permitted sources include WWTFs, CAFOs, and construction and industrial stormwater. The lakes are assumed to have loading from industrial and construction stormwater, and the rivers have loading attributed to the other point sources.

E. coli

There are 77 CAFOs in the WRW. These sources are assigned a WLA=0 by MPCA, and therefore have not been broken down by their specific AUID. A list of these sources can be found in Appendix D of the TMDL and Table 6 of this decision document. In addition to these operations, there are also ten WWTF in the WRW. The WLA for the WWTF are based off the facility's average wet weather design flow or the maximum daily discharge volume for facilities with controlled discharges. When a controlled discharge is greater than loading capacity the equation Allocation = flow contribution from a given source x 126 org E. coli/100 mL is applied, indicating that facilities will not discharge over the numeric criterion. These sources and their corresponding loadings can be found in Table 5 of this decision document and Appendix B of the TMDL. Industrial stormwater did not receive a WLA for *E. coli* as these are not expected to discharge *E. coli*. The same true for construction sites. This is a WLA = 0 for these sources.

Total P

Industrial and construction stormwater are the only regulated source of phosphorus in the WRW impaired lakes watersheds. MPCA has indicated that these sources are not considered to be a significant source of phosphorus loading. Construction stormwater WLAs are calculated by area-weighting the county level average annual percent area under construction by the contributing watershed area for an individual assessment unit. This county level data is found in Minnesota's Stormwater Manual[16] circa 2018. This area is then multiplied by the LC after the MOS and any other WLAs have been taken into account. In practice this is a portion of the modeled LA for this land area. Information on these calculations can be found in section 4.5 of the TMDL.

Wasteload Allocation Tables

Table 5: Watonwan River TMDL - WWTF

Wastewater Treatment Facilities in the Watonwan River Watershed			
Facility	**Stream Reach AUID #**	***E. coli* Wasteload Allocation (billion organisms per day)**	**Permit #**
Truman WWTP	07020010-523	3.721	MN0021652
Butterfield WWTP	07020010-510 07020010-515 07020010-516	13.213	MN0022977
Madelia WWTP	07020010-510	6.268	MN0024040
Saint James WWTP	07020010-502 07020010-510 07020010-515	14.119	MN0024759
Lewisville WWTP	07020010-574 07020010-523	2.223	MN0065722
Delft Sanitary District WWTP	07020010-510	0.029	MN0066541

[16] https://stormwater.pca.state.mn.us/index.php/Main_Page

La Salle WWTP	07020010-510	0.072	MN0067458
Odin-Ormsby WWTP	07020010-510	1.431	MN0069442
Mountain Lake WWTP	07020010-510	19.662	MNG580035
Neuhof Hutterian Brethren	07020010-510 07020010-581	0.553	MNG580113

Table 6: Watonwan River TMDL - CAFOs

NPDES Permitted Concentrated Animal Feeding Operations in the Watonwan River Watershed					
Site Name	**Animal Units**	**Permit Number**	**County**	**HUC-12**	**HUC-12 Name**
Heartland Ag Management - Roelofs Site	1480	MNG440172	Blue Earth	70200100605	County Ditch No 78
Multi-Site - Triple R Pork LLC	1080	MNG440628			
Multi-Site - Triple R Pork LLC	1080	MNG440628			
Aaron Eberhart Farm	990	MNG441313	Watonwan	70200100604	City of Madelia-Watonwan River
Grover Barn 1	990	MNG441318	Blue Earth		
Aaron Eberhart Farm	1440	MNG441794			
G & A Wendinger Farms LLC	1710	MNG441940			
Macho-Eckstein Co LLC	1224.9	MNG440019	Watonwan	70200100602	City of La Salle-Watonwan River
Mike Brandts Farm 1	872	MNG440147			
Bottem Farms Inc	2750	MNG440634			
Tower Hill Farm	936	MNG440681	Watonwan	70200100601	Lake Hanska
Frederickson Pork	900	MNG441093	Brown		
Lakeview Pork - Brown County	900	MNG441153			
Flitter Site	1200	MNG440171	Blue Earth	70200100507	Lower Perch Creek
Riverdale Inc	2563.4	MNG440406	Watonwan	70200100506	Spring Branch Creek
Todd Arduser Farm	990	MNG440540			
Geistfeld Farm Inc	900	MNG440585			

Brad Bowers Farm	900	MNG440593			
Schwartz Farms Inc - Fieldon 31 Site	900	MNG440686			
Fieldon Finishers LLP	1488	MNG441555			
Pietsch-Davis Pork	990	MNG441962			
Dennis Arduser Farm - NW	900	MNG440627	Blue Earth		
Farmland	1080	MNG440081	Watonwan	70200100505	City of Lewisville
Bentdale Farms Inc	1376	MNG440256	Martin	70200100504	Judicial Ditch No 47
Garth Carlson Farm - Sec 1	990	MNG440649			
Sanders Farms	885	MNG440709			
Tilney Pork LLP	2206.8	MNG440084	Watonwan	70200100503	Upper Perch Creek
Neil D Hansen Farm	1200	MNG440249	Martin	70200100502	Judicial Ditch No 72
Geistfeld Brothers Farm - Sec 4	1350	MNG440558			
Tim Steuber Pork - Site 6	1674	MNG440707			
Shane Kuehl Farm - Sec 9	1620	MNG442011			
Petes Pigs	900	MNG440751	Martin	70200100501	Mink Creek
Harbitz Finisher	1200	MNG440086	Watonwan	70200100406	Lower South Fork Watonwan River
Aaron Eberhart Site 1	900	MNG441010			
Schwartz Farms Inc - Urevig Site	990	MNG441281			
Dickens Pigs Inc Site 2	1170	MNG440790	Watonwan	70200100405	Long Lake
Schwartz Farms Inc - North View	900	MNG441047			
Pete's 3600 Head Site	1080	MNG441339			
Robert Cunningham Farm 3	990	MNG440082	Watonwan	70200100404	Middle South Fork Watonwan River

Multi-Site - Dennis Coleman Farm - Sites 1-3	2599.2	MNG440372			
Matt & Jeff Romsdahl Farm	1200	MNG441083			
Schwartz Farms Inc - South View Site	990	MNG441239			
Coleman Chops	995.2	MNG441994			
Jerry Gronewold - Ormsby Site	1233.6	MNG440254	Martin	70200100403	Willow Creek
Extra Tender LLP	1116	MNG440255			
Flohrs Finishing	2289	MNG440632			
Multi-Site - Kueker Sites 1-3	900	MNG440728	Watonwan		
Multi-Site - Kueker Sites 1-3	900	MNG440728			
Romsdahl Irish Lake Finisher	900	MNG441006	Watonwan	70200100402	Upper South Fork Watonwan River
Christensen Farms Site C015	1200	MNG440152	Watonwan	70200100401	Bingham Lake
Dan Sturm Farm	1410	MNG440080	Watonwan	70200100304	Lower Saint James Creek
Dickens Pigs Inc	1152	MNG440020	Watonwan	70200100303	Upper Saint James Creek
Romsdahl Long Lake Finisher	900	MNG441004			
CK Pork LLC Finisher	900	MNG441021			
All Four Pork	945	MNG441304			
Mike Brandts Farm 1	888	MNG440147	Watonwan	70200100302	Lower Butterfield Creek
HK Pork, LLC	990	MNG441253			
Menken Farms	250	MN0071251	Watonwan	70200100301	Upper Butterfield Creek
Elwood Heldt Farm	1230	MNG440402			
Braaten Home Site	1440	MNG441255			
Christensen Farms Site N008	645	MNG440651	Watonwan	70200100203	Lower North Fork Watonwan River
David Englin Farm - Sec 1	1556	MNG440766	Cottonwood		
Christensen Farms Site C009	1200	MNG440061	Cottonwood	70200100202	Middle North Fork Watonwan River

Schwartz Farms Inc - PAP	2758.9	MNG440286	Cottonwood	70200100201	Upper North Fork Watonwan River
Christensen Farms Site N012	860	MNG440825			
Schwartz Farms Inc - Delton Site	900	MNG440977			
Schwartz Farms Inc - Hesse Site	990	MNG441267			
Oeltjenbruns Finishing Site	990	MNG441277			
Michael Pearson Farm	900	MNG440623	Watonwan	70200100105	East Sveadahl Church-Watonwan River
North Branch Pork	840	MNG440697	Watonwan		
Lange Finisher	990	MNG441221	Watonwan		
Schwartz Farms Inc - CLF-1	1960	MNG441173	Cottonwood		
J Evers Farms	936	MNG440571	Watonwan	70200100104	Cottonwood Lake
Christensen Farms Site F048	936	MNG440582			
Schwartz Farms Inc - Sveadahl 20	990	MNG441204			
SFI - Carlson 12	900	MNG440802	Cottonwood	70200100101	Headwaters Watonwan River
Schwartz Farms Inc - Immer	900	MNG440903	Cottonwood	70200100101	Headwaters Watonwan River

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

6. Margin of Safety (MOS)

The statute and regulations require that a TMDL include a margin of safety (MOS) to account for any lack of knowledge concerning the relationship between load and wasteload allocations and water quality (CWA §303(d)(l)(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.

Comments:

MPCA applied an explicit 10% MOS to their WRW TMDLs. See Sections 4.2, Margin of Safety, of the TMDL document. According to MPCA, this MOS should account for any environmental variability in pollutant loading, limitations in water quality data, errors in the calibration and validation of the HSPF model, and limitations associated with the drainage area-ratio method for extrapolating flows. MPCA states and EPA agrees that this MOS should account for any uncertainty attributed to the modeling efforts.

E. coli
MPCA utilized both an explicit MOS and an implicit MOS in the bacteria TMDLs. A 10% explicit margin of safety was established for the WRW *E. coli* TMDLs. 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 make quantifying stormwater bacteria loads particularly difficult. The MOS for the WRW bacteria TMDLs also incorporated certain conservative assumptions in the calculation of the TMDLs. No rate of decay, or die-off rate of pathogen species, were used in the TMDL calculations or in the creation of load duration curves for *E. coli*. Bacteria have a limited capability of surviving outside their hosts, and normally a rate of decay would be incorporated.

As stated in EPA's Protocol for Developing Pathogen TMDLs[17], 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 conditions of the water. EPA agrees with this MOS due to MPCA's explanation above.

Total P
A 10% explicit margin of safety was established for the WRW TMDLs. MPCA states that the calibrated HSPF model is the used to load the BATHUB model to determine the TMDL allocations. MPCA, therefore applied a similar 10% MOS as it should provide accurate protection. BATHTUB models used to develop the lake TMDLs show generally good agreement between the observed lake water quality and the water quality predicted by the lake response models (Appendix C of the TMDL). The watershed loading models and lake response models reasonably reflect the watershed and lake conditions. EPA agrees with this MOS due to MPCAs explanation above.

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

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

Comment:
Seasonal variation is accounted for in each of the TMDLs by virtue of the datasets and modeling approaches capturing a wide range of conditions within a season, and across multiple years. In addition, MPCA has also developed their WQS to reflect the periods of concern associated with the designated uses addressed in this TMDL. Furthermore, the lake models specifically target the summer months, which are both the most biologically active, and when human contact is at its peak.

E. coli
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. Alternatively, loading rates are relatively lower 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 for the class 2 waters and May 1st to October 31st for the class 7 waters. To achieve this goal, the *E. coli* TMDLs use the LDC methodology. The development of the LDCs utilized

[17] Protocol for Developing Pathogen TMDLs EPA 841-R-00-002 – https://nepis.epa.gov/Exe/ZyPDF.cgi/20004QSZ.PDF?Dockey=20004QSZ.PDF

direct flow data measured for the Watonwan River assessment unit and modeled flow data for the others. The modeled flow (HSPF) measurements represent a variety of flow conditions from the recreation season. LDCs developed from these modeled flow conditions represent a range of flow conditions within the WRW and thereby account for seasonal variability over the recreation season.

Total P

Phosphorus levels in WRW lake TMDLs vary over the growing season June 1st to September 30th. The water quality targets were designed to meet the eutrophication WQS 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 WRW phosphorus TMDL efforts, the LA and WLA estimates were calculated from modeling efforts (BATHTUB and HSPF), which incorporated mean growing season total phosphorus values. Nutrient loading capacities were set in the TMDL development process to meet the WQS during the most critical period. The mid-late summertime period is typically when eutrophication standards are exceeded and water quality within the WRW is deficient. By calibrating the modeling efforts to protect these waterbodies during the worst water quality conditions of the year, it is assumed that the loading capacities established by the TMDLs will be protective of water quality during the remainder of the calendar year (October through May).

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

8. Reasonable Assurances

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

When a TMDL is developed for waters impaired by both point and nonpoint sources, and the WLA is based on an assumption that nonpoint source load reductions will occur, EPA's 1991 TMDL Guidance states that the TMDL should provide reasonable assurances that nonpoint source control measures will achieve expected load reductions in order for the TMDL to be approvable. This information is necessary for EPA to determine that the TMDL, including the load and wasteload allocations, has been established at a level necessary to implement water quality standards.

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

Comment:

The Clean Water Legacy Act (CWLA) is a statute passed in Minnesota in 2006 for the purposes of protecting, restoring, and preserving Minnesota water. The CWLA provides the process to be used in Minnesota to develop TMDL implementation plans, which detail the restoration activities needed to achieve the allocations in the TMDL. The TMDL implementation plans are required by the State to obtain funding from the Clean Water Fund (CWF). The Act discusses how MPCA and the involved public agencies and private entities will coordinate efforts regarding land use, land management, water management, etc. Cooperation is also expected between agencies and other entities regarding planning efforts, authorities, and responsibilities. This would also 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. The implementation plans are required to contain ranges of cost estimates for point and nonpoint source load reductions, as well as monitoring efforts to determine effectiveness. MPCA has developed guidance on what is required in the implementation plans (Implementation Plan Review Combined Checklist and Comment, MPCA), which includes cost estimates, general timelines for implementation, and interim milestones and measures. The Minnesota Board of Soil and Water Resources (BWSR) administers the CWF and has developed a detailed grants policy explaining what is required to be eligible to receive CWF money[18].

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. MPCA views 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. The WRAPS are required to contain such elements as the identification of impaired waters, watershed modeling outputs, point and nonpoint sources, load reductions, etc.[19, 20] The WRAPS also contain a preliminary implementation table of strategies to achieve loading reductions for both point and nonpoint sources.[21] These tables contain more than needed actions including: a timeline for achieving water quality reductions; reductions needed from both point and nonpoint sources; the governmental units responsible; and interim milestones for achieving the actions. All of the required components can be found in MPCA's WRAPS guidance.[22] The WR WRAPS was approved by MPCA on January 23, 2020.

EPA agrees that the detail provided in the WRAPS document is a sound starting point for providing a focused, comprehensive implementation plan on the watershed scale providing reasonable assurance that over the long-term load reductions will be achieved. WRAPS help to identify generalized watershed goals and develop a system to address these concerns. Specifically, the WR WRAPS states that the Water Resources Center at Minnesota State University, Mankato (MSUM) worked with the Greater Blue Earth River Basin Alliance (GBERBA) and local conservation partners to create a network of citizens and conservation staff. This cohort is well suited for future efforts within the watershed. Furthermore, BWSR is developing a One Watershed, One Plan (1W1P)[23] for the WRW. In addition to these efforts, MPCA has also developed a Section 319 Small Watershed Focus program (SWF)[24]. This program helps target solutions on the shorter-term for specific impaired waterbodies and small (Sub Framework planning level) watersheds. Projects to achieve the outlined reductions plans will be funded through various programs including: Clean Water Fund projects; Clean Water Act Section 319 grants; NRCS programs (EQUIP, etc.); and local government cost-share and loan programs.

---

[18] Minnesota Clean Water Fund – http://www.bwsr.state.mn.us/cleanwaterfund/index.html
[19] Chapter 114D.26; CWLA – https://www.revisor.leg.state.mn.us/statutes/?id=114D&view=chapter#stat.114D.26
[20] Clean Water Fund RFP – http://www.bwsr.state.mn.us/cleanwaterfund/index.html
[21] Chapter 114D.26, Subd. 1(8); CWLA – https://www.revisor.leg.state.mn.us/statutes/?id=114D&view=chapter#stat.114D.26
[22] WRAPS Template – https://www.pca.state.mn.us/water/tmdl-policy-and-guidance
[23] BWSR One Watershed, One Plan - http://bwsr.state.mn.us/planning/1W1P/index.html
[24] Section 319 Small Watersheds Focus – https://www.pca.state.mn.us/water/section-319-small-watersheds-focus

For the reasons above EPA determines that MPCA has provided reasonable assurance that actions identified in the implementation section of the TMDL and those of the WRAPS, 1W1P, and SWF will meet the loading capacities and allocations calculated for the impaired reaches within the WRW. EPA anticipates that 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. To address the lack of regulatory authority MPCA developed the above-mentioned WRAPS and is working on developing the WR 1W1P to better identify nonregulated sources and community specific BMPs to reduce pollutant loading. The sections below outline the reasonable assurance by pollutant sources.

Point Source

Reasonable assurance that WLAs will be implemented is provided by regulatory actions. According to 40 CFR 122.44(d)(1)(vii)(B), NPDES permit effluent limits must be consistent with assumptions and requirements of all WLAs in an approved TMDL. MPCA implements its storm water and NPDES permit programs, and is responsible for making the effluent limits consistent with the WLAs in this TMDL. TSS and Total P WLAs were assigned in this TMDL for general construction and industrial stormwater sources (MNR100001). The NPDES program requires construction and industrial sites to create a Stormwater Pollution Prevention Plan (SWPPP) that summarizes how stormwater will be minimized from the site. As a part of this SWPPP, the general permit for construction requires that BMPs are properly selected, installed, and maintained. Section 9.1 of the TMDL discusses these strategies.

Nonpoint Sources

MPCA has identified several local partners which have expressed interest in working to reduce nonpoint source pollution within the WRW. The following groups are expected to work closely with one another to ensure that pollutant reduction efforts via BMPs are being implemented: Watonwan River Watershed Network; GBERBA; Minnesota River Watershed Alliance and Minnesota River Congress; Minnesota River Basin Data Center; Coalition for a Clean Minnesota River; local municipal governments; private land owners; and state and federal government agencies. These groups are expected to effectively address the nonregulated sources of pollution identified in Section 4 of this decision document and Section 3.6 of the TMDL. Description of the work that many of these groups have implemented in the past can be found in Section 7 of the TMDL. In addition, MPCA list specific BMP that can be implemented for nonpermitted sources Section 9.2 of the TMDL. Additional recommendations by subwatershed that have been selected with local guidance can be found in Section 3.1 of the WR WRAPS document.[25]

EPA finds that the eighth criterion has been adequately addressed.

9. Monitoring Plan to Track TMDL Effectiveness

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

---

[25] Watonwan River WRAPS – https://www.pca.state.mn.us/sites/default/files/wq-ws4-62a.pdf

Comment:
MPCA has a comprehensive water quality monitoring program, Minnesota's Water Quality Monitoring Strategy[26]. This program is comprised of three monitoring programs: Intensive Watershed Monitoring[27], Watershed Pollutant Load Monitoring Network[28], Citizen Stream and Lake Monitoring Program[29]. MPCA's statewide monitoring program assesses the states waters on a ten-year rotating timeframe. This past monitoring created a robust dataset that was used for the model development of the WRW TMDL, and will be used as a baseline to evaluate overall improvements in the watershed. Furthermore, continued water quality monitoring within the basin will provide insight into the success or failure of BMP systems designed to reduce *E. coli*, nutrient and TSS loading into the surface waters of the watershed. Local watershed managers will 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.

EPA finds that the ninth 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:
As was stated in the Reasonable Assurance section of this Decision Document, Watonwan River Watershed Network; GBERBA; Minnesota River Watershed Alliance and Minnesota River Congress; Minnesota River Basin Data Center; Coalition for a Clean Minnesota River; local municipal governments; private land owners; and state and federal government agencies will all play a role in implementation. Work is ongoing and according to the TMDL document specific practices to be implemented include riparian zone management, feedlot filter strips, clean water diversions, livestock management (including exclusion fencing), grassed waterways, conservation tillage, and the use of cover crops. Lake specific managment practices include fish removal, chemical treatment, and water level management.

As for the WR WRAPS (Section 3 Restoration and Protection Strategies), MPCA outlines various BMPs to be implemented providing a roadmap towards achieving WQS. A description of these practices can be found in Table 21 of the WR WRAPS document. Furthermore, MPCA indicates that there will be annual watershed newsletters and outreach events to inform watershed residents of various pollution sources and BMPs to address these issues. Moreover, as a means of increased accountability, MPCA identifies various government entities in the WRAPS that will be responsible for achieving these goals.[30]

The findings from the WRW TMDLs, WRAPS, and other existing plans will be used to support local

[26] Minnesota's Water Quality Monitoring Strategy – https://www.pca.state.mn.us/sites/default/files/p-gen1-10.pdf
[27] Intensive Watershed Monitoring – https://www.pca.state.mn.us/water/watershed-sampling-design-intensive-watershed-monitoring
[28] Watershed Pollutant Load Monitoring Network – https://www.pca.state.mn.us/water/watershed-pollutant-load-monitoring-network
[29] Citizen Stream and Lake Monitoring Program – https://www.pca.state.mn.us/water/citizen-water-monitoring
[30] WR WRAPS – https://www.pca.state.mn.us/sites/default/files/wq-ws4-62a.pdf

working groups and jointly develop scientifically supported restoration and protection strategies. Some of this work will culminate in the development of the proposed 1W1P mentioned in the Reasonable Assurance section of this Decision Document. These goals will be accomplished through education and outreach, local ordinances, and BMPs. Various locally specific BMPs and restorations strategies outlined in the existing plans and in Section 9 of the WRW TMDL can be found in the subsections below broken down by pollutant.

E. coli
MPCA's main approach to address bacteria contamination is to increase understanding of the main sources and provide that knowledge to the residents of the watershed. Increased education and outreach to the general public bring greater awareness to the issues surrounding bacteria contamination and strategies to reduce 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, land managers and other groups who play a key role in the management of bacteria sources.

Pasture Management/Livestock Exclusion Plans – Reducing livestock access to stream environments will lower the opportunity for direct transport of bacteria 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 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 inputs.

Manure Collection and Storage Practices – Manure has been identified as a source of bacteria. Bacteria can be transported to surface waterbodies via stormwater runoff. Bacteria laden water can also leach into groundwater resources. Improved strategies for the collection, storage and management of manure can minimize impacts of bacteria entering the surface and groundwater system. Repairing manure storage facilities or building roofs over manure storage areas may decrease the number 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 consider 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 bacteria 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 bacteria to surface water environments. Additionally, cleaner stormwater runoff can be diverted away from feedlots to prevent bacteria contamination.

SSTS – Improvements to septic management programs and educational opportunities can reduce the occurrence of septic pollution. Educating the public on proper septic maintenance, finding and eliminating illicit discharges and repairing failing systems could lessen the impacts of septic derived bacteria inputs into the WRW.

Riparian Area Management Practices – Protection of streambanks within the watershed through planting of vegetated/buffer areas with grasses, legumes, shrubs or trees will mitigate bacteria inputs into surface waters. These areas will filter stormwater runoff before the runoff enters the main stem or tributaries of the WRW.

WWTF – Adherence to the state NPDES permits though on-site control mechanisms is seen as a sufficient means of source control from WWTFs, some plants may need to be updated with newer technologies.

MS4s – While not currently a source if future areas are placed under an MS4 permit, retention basins are often used as a primary mechanism for achieving any necessary WLA reductions.

Total P

As with *E. coli* a major component of addressing the phosphorus loading is to educate the watershed inhabitants. For the WRW models the primary contributor of overall loading has been attributed to internal loading. That being said, practices that prevent phosphrous from reaching the lake, are both beneficial in the short and long-term. For these reasons the practices in this section are about both about preventing phosphorus from reaching the impaired lakes and about controlling internal loading.

Internal Loading Control Measures – MPCAs control strategies for internal loading include rough fish control, chemical binding of phosphorus (Alum treatments), and a re-establishment of native vegetation. Additionally, MCPA has indicated that controlling lake levels may help mitigate phosphorus release from sediment. These practices in combination with watershed controls can reduce or eliminate the impact of internal loading on overall lake water quality.

Septic Field Maintenance – Septic systems are believed to be a source of nutrients to waters in the WRW. 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 waterbody. 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 nutrients inputs into the WRW.

Manure Management (feedlot and manure stockpile runoff controls) – Manure has been identified as a potential source of nutrients in the WRW. Nutrients derived from manure can be transported to surface waterbodies via stormwater runoff. Nutrient laden water can also leach into groundwater resources. Improved strategies in the collection, storage and management of manure can minimize impacts of nutrients entering the surface and groundwater system. Repairing manure storage facilities or building roofs over manure storage areas may decrease the amount of nutrients in stormwater runoff.

Pasture Management and Agricultural Reduction Strategies – These strategies involve reducing nutrient transport from fields and minimizing soil loss. Specific practices would include; erosion control through conservation tillage, reduction of winter spreading of fertilizers, elimination of fertilizer spreading near open inlets and sensitive areas, installation of stream and lake shore buffer strips, streambank stabilization practices (gully stabilization and installation of fencing near streams), and nutrient management planning.

Industrial and Construction Stormwater – adherence to the specific of the general industrial and construction stormwater permits, is seen as a sufficient means of addressing this source.

EPA finds the tenth criterion has been adequately addressed. EPA reviews, but does not approve TMDL 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)(l)(ii)). In guidance, EPA has explained that final TMDLs submitted to EPA for review and approval should describe the State's/Tribe's public participation process, including a summary of significant comments and the State's/Tribe's responses to those comments. When EPA establishes a TMDL, EPA regulations require EPA to publish a notice seeking public comment (40 C.F.R. §130.7(d)(2)).

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

Comment:

The TMDL was on public notice from July 22nd, 2019 to September 20th, 2019. The public comment period was announced in an MPCA news release and published in the Minnesota State Register on July 22nd, 2019. Electronic copies of the draft TMDL were published on the MPCA website along with a notification of the public comment period.

MPCA provided the public comments they received and their responses for both their WRAPS and TMDL reports. This decision document will only address the comments made about the WRW TMDL as the WRAPS report is a state document. Many of the comments referenced topics not applicable to this TMDL such as: pollutants that are not addressed in this TMDL; specifics related to the WRAPS report outside the scope of this TMDL; and other TMDLs altogether.

The majority of the comments related to this TMDL were regarding general TMDL development and specifics related to how the watershed was modeled. MPCA appropriately addresses these concerns acknowledging limitations in modeling and clarifying requirements of a TMDL as defined in the CWA. Other comments were regarding existing work being done in the watershed. MPCA acknowledged this work, revised the TMDL document to include some of the efforts in the reasonable assurance section of the TMDL, and invited interested parties to directly work with them to improve water quality.

MPCA received multiple comments on tile drains impact and their impact on the WRW. MPCA responded clearly to these commenters on why they believe tile drains impact the system and how managing these systems may improve overall watershed health. MPCA referenced studies that indicate an increase in annual runoff from tile-drained fields over that of non-tile drained fields and discussed the potential relationship with pollutant loading.

All comments were addressed in letters sent out on January 6th, 2020.

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

12. Submittal Letter

A submittal letter should be included with the TMDL submittal, and should specify whether the TMDL is being submitted for a *technical review* or *final review and approval.* Each final TMDL submitted to EPA should be accompanied by a submittal letter that explicitly states that the submittal is a final TMDL submitted under Section 303(d) of the Clean Water Act for EPA review and approval. This clearly establishes the State's/Tribe's intent to submit, and EPA's duty to review, the TMDL under the statute. The submittal letter, whether for technical review or final review and approval, should contain such identifying information as the name and location of the waterbody, and the pollutant(s) of concern.

Comment:
On Thursday March 12th, 2020, EPA received a submittal letter dated January 31st, 2020 signed by Glenn Skuta, MPCA Watershed Division Director, addressed to Thomas Short, EPA Region 5, Water Division Director. The submittal letter identified the Watonwan River Watershed as the subject of the TMDL. The locations of the specific waterbodies were provided in the supporting documentation. The TMDL submittal letter states that the pollutants of concern are bacteria, and eutrophication. These concerns are addressed by the *E. coli* and Total P TMDLs in this document. The letter explicitly states that the Watonwan River Watershed TMDL was submitted for final approval by EPA under Section 303(d) of the Clean Water Act.

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

13. Conclusion

After a full and complete review, the EPA finds that the TMDLs for Watonwan River Watershed for *E. coli* and Total P meet all of the required elements of an approvable TMDL. This TMDL approval is for **fourteen TMDL**: ten (10) *E.* coli TMDLs and four (4) total phosphorus TMDLs. These TMDLs address impairments for aquatic recreational and aquatic life use impairments as identified on Minnesota's 2016 303(d) list.

U.S. EPA's approval of the Watonwan River Watershed TMDLs extend to the waterbodies which are identified in this Decision Document and the TMDL study with the exception of any portions of the waterbodies that are within Indian Country, as defined in 18 U.S.C. Section 1151. U.S. EPA is taking no action to approve or disapprove the State's TMDLs with respect to those portions of the waters at this time. U.S. EPA, or eligible Indian Tribes, as appropriate, will retain responsibilities under Section 303(d) for those waters.