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

May 8, 2020

REPLY TO THE ATTENTION OF:
WW-16J

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

Dear Mr. Skuta:

The U. S. Environmental Protection Agency has conducted a complete review of the final Total Maximum Daily Loads (TMDLs) for the Boise de Sioux River Watershed (BdSRW) including supporting documentation and follow up information. The BdRW is located in central western Minnesota and includes the drainage areas of Lake Traverse and the Bois de Sioux River within the Red River Basin. The BdSRW TMDL watershed is in the Otter Tail, Grant, Wilkin, and Traverse Counties in Minnesota. The TMDLs address the aquatic life use impairment resulting from excessive total phosphorus and total suspended solids and aquatic recreation use impairment due to *E. coli*.

The TMDLs meet the requirements of Section 303(d) of the Clean Water Act and EPA's implementing regulations at 40 C.F.R. Part 130. Therefore, EPA hereby approves Minnesota's eight TMDLs for five segments in the BdSRW. The statutory and regulatory requirements, and EPA's review of Minnesota's compliance with each requirement, are described in the enclosed decision document.

We wish to acknowledge Minnesota's effort in submitting these TMDLs and look forward to future TMDL submissions by the State of Minnesota. If you have any questions, please contact Ms. Donna Keclik at 312-886-6766.

Sincerely,

Tera L. Fong

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Date: 2020.05.08 12:23:39 -05'00'

Tera L. Fong
Division Director, Water Division

Enclosure

wq-iw5-12g

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

REPLY TO THE ATTENTION OF:
W-16J

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 has reviewed the approval (original approval May 8, 2020 and revised July 8, 2020) of the final Total Maximum Daily Loads (TMDL) for segments within the Bois de Sioux River Watershed (BdSRW) and has determined that there was an oversight made in the Decision Document, specifically in Section 1 and Table 1. EPA did not recognize a fish bioassessment impairment for the Bois de Sioux River segment (09020101-501) and its connection to approved total phosphorus and sediment TMDLs for that same segment. Additionally, EPA did not recognize a fish bioassessment impairment for the Rabbit River segment (09020101-502) and its connection to approved total phosphorus and sediment TMDLs for that same segment. EPA has updated Table 1 in Section 1 in a revised BdSRW TMDL Decision Document.

I am enclosing a copy of the revised Decision Document for your records. If you have any questions, please contact Mr. David Werbach, TMDL Coordinator at 312-866-4242.

Sincerely,

DAVID PFEIFER

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Date: 2022.02.17 16:26:41 -06'00'

David Pfeifer
Chief, Watersheds and Wetlands Branch

TMDL: Bois de Sioux River Watershed, *E. coli*, Total Suspended Solids, Total Phosphorus TMDL

Effective Date: February 17, 2022 (revised)

Decision Document for Approval of the Bois de Sioux River Watershed, Minnesota, *E. coli*, Total Suspended Solids, Total Phosphorus TMDL Report

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

1. Identification of Water body, Pollutant of Concern, Pollutant Sources, and Priority Ranking

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

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

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

(1) the spatial extent of the watershed in which the impaired water body is located;
(2) the assumed distribution of land use in the watershed (e.g., urban, forested, agriculture);
(3) population characteristics, wildlife resources, and other relevant information affecting the characterization of the pollutant of concern and its allocation to sources;
(4) present and future growth trends, if taken into consideration in preparing the TMDL (e.g., the

TMDL could include the design capacity of a wastewater treatment facility); and
(5) an explanation and analytical basis for expressing the TMDL through *surrogate measures*, if applicable. *Surrogate measures* are parameters such as percent fines and turbidity for sediment impairments; chlorophyll *a* and phosphorus loadings for excess algae; length of riparian buffer; or number of acres of best management practices.

***Comment*:**
Location/Description/Spatial Extent: The Bois de Sioux Watershed (BdSRW) is located in central western Minnesota and includes the drainage areas of Lake Traverse and the Bois de Sioux River. The Bois de Sioux and Otter Tail Rivers converge to form the headwaters of the Red River of the North. The BdSRW covers 2,908 square kilometers (718,685 acres) in areas of Otter Tail, Grant, Wilkin, Big Stone, and Traverse Counties in Minnesota, Roberts County in South Dakota, and Richland County in North Dakota. Land use in the BdSRW is largely agriculture, approximately 86%, with an extensive drainage network and has low urban development. Approximately 361,222 acres of the watershed area lies within Minnesota (Section 3 of the TMDL Report).

The BdSRW lies within two of Minnesota's Level Three ecoregions. The majority of the watershed lies within the Lake Agassiz Plain (LAP) ecoregion which MPCA indicated had deposited thick layers of silt and clay (Section 2.1 of the TMDL Report). The LAP ecoregion is very flat and featureless, with slopes of 0 – 2 %. The headwaters region of the watershed lies within the Northern Glaciated Plains ecoregion. Soils within this ecoregion are generally very fertile. The terrain varies from flat to gently rolling hills within this ecoregion. MPCA stated that most of the original wetlands have been lost to agricultural drainage.

Cities and towns within the BdSRW include Breckenridge, Browns Valley, Campbell, Tintah, and Wahpeton. Figure 1 of the TMDL identifies the watershed including the impaired lakes and streams. Table 1 below identifies the segments for which TMDLs are being developed.

Table 1: Waterbodies addressed by the Bois de Sioux River Watershed TMDL

Waterbody	Reach Description or Lake	Stream Use Class/ Lake Ecoregion and Type	Assessment Unit ID/Minnesota Department of Natural Resources (DNR) Lake #	Affected Designated Use	Pollutant or Stressor addressed
Ash	3 mi. NW of Wendell	2B, 3C	26-0294-00	Aquatic Recreation: Nutrient/ Eutrophication Biological Indicators (Phosphorus)	Total Phosphorus (TP)
Upper Lightning	Near Western	2B, 3C	56-0957-00	Aquatic Recreation: Nutrient/ Eutrophication Biological Indicators (Phosphorus)	TP
Bois de Sioux River	Rabbit R to Otter Tail R	2C	09020101-501	Aquatic Life: Fish Bioassessments, Turbidity	TP, TSS, and DO
Rabbit	Wilkin	2C	09020101-502	Aquatic Recreation:	*E. coli*

River	County line to Bois de Sioux R			*E. coli*	
Rabbit River	Wilkin County line to Bois de Sioux R	2C	09020101-502	Aquatic Life: Macroinvertebrate Bioassessments, Fish Bioassessments, Turbidity	TP, TSS, and DO
Unnamed Creek (Doran Slough)	Headwaters to Bois de Sioux R	2C	09020101-510	Aquatic Recreation: *E. coli*	*E. coli*

Lakes

Ash Lake (3 mi. NW of Wendell, MN)

Ash Lake (DNR Lake ID 26-0294) is located in Grant County with portions of its watershed located in Grant County (92%) and Otter Tail County (8%). It is a very shallow lake (mean depth 1 meter). Growing season mean values of TP, chlorophyll-a (chl-a), and Secchi depth transparency by year are summarized for Ash Lake in Table 10 and Figures 2, 3, and 4 of the TMDL Report.

Upper Lighting (Near Western, MN)

Upper Lightning Lake (DNR Lake ID 56-0957) is located in Otter Tail County with portions of its watershed located in Otter Tail County (8%) and Grant County (92%). It is also a very shallow lake (mean depth 1 meter). Recent fish, aquatic vegetation, and growing season annual average water quality data (TP, chl-a, and Secchi depth transparency) are summarized for Upper Lightning Lake in Table 11 and Figures 5, 6, and 7 of the TMDL Report.

MPCA indicated that the main stressor to Ash and Upper Lightning appears to be disturbance to the aquatic plant community due to light availability influenced by algal density.

Streams

Bois de Sioux R (Rabbit R to Otter Tail R (segment 09020101-501)

The Bios de Sioux River subwatershed drains 41 square miles of land within Traverse and Wilkin Counties. The impaired segment lays within Wilkin County. Numerous small streams flow westward into the Bois de Sioux River and several small channelized ditches flow across the upper subwatershed. Land use is primarily crop land (86.7%). Remaining percentages of land use include wetland (4.8%), rangeland (3%), forest (0.7%), open water (0.5%), and developed (4.3%).

Rabbit River (Wilkin County line to Bois de Sioux R) (segment 09020101-502)

The Rabbit River subwatershed is the largest 11- digit watershed in the BdSRW, encompassing 327 square miles of land within the counties of Wilkin, Traverse, Ottertail, and Grant. The Rabbit River originates from a series of small ditches in the east central portion of the subwatershed. The river flows westward before joining the South Fork of the Rabbit River near the community of Campbell. The South Fork of the Rabbit River is connected to an extensive network of ditches that drain the southern portion of the subwatershed. The Rabbit River continues flowing westward until flowing into the Bois de Sioux River. Land use within the watershed unit is primarily cropland (89%). Remaining small percentages of land use include developed (5.1%), forest (0.4%), rangeland (1.5%), wetland (2.7%), and open water (1.2%). The communities of Nashua, Campbell, and Tintah are found within the subwatershed. In 2010, the MPCA monitored ten AUID's within this subwatershed. Seven biological monitoring sites are also within the subwatershed.

Unnamed Creek (Doran Slough) (Headwaters to Bois de Sioux R) (segment 09020101-510)
Doran Slough originates in the far eastern portion of the subwatershed and flows westward before turning toward the north, eventually entering into the Bois de Sioux River near the community of Breckenridge. Water quality data were available on Unnamed Creek (Doran Slough). Doran Slough drains through 27 miles of agricultural land before it joins the Bois de Sioux just downstream of Breckenridge, Minnesota. The reach is impaired for aquatic life use due to low oxygen levels and aquatic recreation use due to excessive levels of bacteria.

Table 2: Bois de Sioux River Watershed and impaired lake and stream subwatershed land cover

AUID	Waterbody Name	Developed	Cropland	Grassland/Pasture	Woodland	Wetlands	Open Water
26-0294-00	Ash	5 %	75 %	0%	2%	12%	7%
56-0957-00	Upper Lightning	4%	75%	0.6%	0.7%	4%	15%
09020101-501	Bois de Sioux River	6%	85%	3%	0.7%	5%	1%
09020101-502	Rabbit River	5%	88%	2%	0.4%	3%	2%
09020101-510	Doran Slough	6%	91%	0.7%	0.5%	1%	0.1%
Bois de Sioux River Watershed		5%	78%	5%	1%	6%	5%

<u>Problem Identification/Pollutant(s) of Concern:</u> As part of the MPCA Watershed Approach, streams, lakes, and wetlands throughout the BdSRW were monitored for impacts to aquatic recreation, aquatic life, and aquatic consumption. A stream is considered impaired for impacts to aquatic life if the fish Index of Biotic Integrity (IBI), macroinvertebrate IBI, dissolved oxygen, turbidity, or certain chemical standards are not met. Streams are considered impaired for impacts to aquatic recreation if bacteria standards are not met. Lakes are considered impaired for impacts to aquatic recreation if total phosphorus, chl-a, or Secchi depth standards are not met.

This TMDL report addresses the aquatic life use impairment for in three stream segments for one or more of the following pollutants; total phosphorus (TP), total suspended solids (TSS) and aquatic recreation for Escherichia coli (*E. coli*). It also addresses aquatic recreation impairments in two lakes for TP.

<u>Source Identification:</u> Section 3.6 of the TMDL report discusses the sources for both streams and lakes.

Nonpoint Sources
E. coli - MPCA identified likely sources of bacteria for nonpoint source to include inadequate or failing subsurface sewage treatment systems (SSTS), livestock, wildlife and pets. Due to the low number of humans, pets, and livestock in the BdSRW, MPCA believes that wildlife is likely the dominant source of fecal contamination to the impaired streams (Section 3.6.3.2 of the TMDL Report).

MPCA stated that the application of biosolids from wastewater treatment facilities (WWTFs) are highly regulated, monitored, and tracked (see Minn. R. ch. 7041, Sewage Sludge Management). Disposal methods that inject or incorporate biosolids within 24 hours of land application result in minimal possibility for mobilization of bacteria to downstream surface waters. While surface application could conceivably present a risk to surface waters, little to no runoff and bacteria transport are expected if permit restrictions are followed. Therefore, land application of biosolids was not included as a source of bacteria.

Total Phosphorus - Elevated levels of phosphorus in rivers and streams, and lakes can result in increased algae growth, reduced water clarity, reduced oxygen in the water, fish kills, altered fisheries, and toxins from cyanobacteria (blue green algae) which can affect human and animal health. Excessive amounts of nutrients, sediment and fertilizer from fields enter adjacent streams and rivers. Phosphorus can attach to soil particles, and therefore sediment washed into the waterbodies can carry phosphorus into the system.

MPCA indicated that phosphorus loading from non-point sources for lakes are from watershed runoff, upstream loadings, runoff from feed lots, septic systems, direct atmospheric deposition, and internal loads (Section 3.6.1.1 of the TMDL Report). An HSPF model was used to estimate watershed runoff volumes and TP loads from the direct drainage area of impaired lakes. The HSPF model was used to estimate the six-year (2001 through 2006) average annual flow and phosphorus load from the drainage area of each impaired lake, and daily streamflow estimates from 2001 through 2006 in the impaired streams. The HSPF TP loads for each lake in Table 23 of the TMDL report was used to determine existing conditions in the TMDL.

For steams, TP loads are tied to sediment loading under high flow conditions, indicating that watershed runoff is the dominant source of TP under high flows. Under low flow conditions, an additional source of TP was added to calibrate the HSPF model, indicating that groundwater/subsurface water or TP entrainment from stream sediments is the dominant source of TP under low flows.

Sediment TSS - HSPF modeled results indicate that TSS loading is generally highest in higher slope agricultural areas with higher runoff potential (i.e., less soil infiltration capacity). The TP loading follows similar patterns but is more strongly influenced by runoff potential than slope (Section 3.6.2 of the TMDL Report). Both TSS and TP loading decrease with increased amounts of depressional storage (ponds, wetlands, and lakes) in the watershed, illustrating the importance of these features for reducing runoff and nutrient export.

MPCA indicated that field erosion accounts for 65% to 90% of the total suspended sediment in the Red River Basin. Based on studies within the Red River Basin and observations made during the geomorphology stream survey for the development of this TMDL report, it is expected that the sediment loading in the BdSRW is from approximately 80% field sources and 20% non-field sources.

Point Sources

The regulated sources of *E. coli*, phosphorus, and sediment within the subwatersheds addressed in this TMDL study, include WWTF effluent (TP, TSS, *E. coli*), industrial discharge (sugar beet storage discharge (TP), concentrated animal feeding operation (CAFO), construction stormwater, and industrial stormwater. There is one WWTF in the BdSRW (Table 3 below). However, discharges to the Mustinka River, upstream of Mud Lake were calculated to meet the Bois de Sioux River -501 loading which are identified in Table 4 below. There is one CAFO and one discharge from the Minn-Dak Farmers' Cooperative Beet Piling Grounds in the BdSRW. There are no MS4 discharges in the watershed.

Table 3: Permittees in the BdSRW for the Rabbit River (09020101-502) segment

Facility	Permit Number	Type of facility	Discharge volume (mgd)	Daily TP WLA concentration (mg/L)	Daily TP WLA Load (kg/day)
Campbell WWTF	MN0020915	WWTF-pond system	0.285	1.0	1.08
Chad Hasbargen Farm Sec 2	MN0069744	CAFO	0	0	0
Hawes Piling Ground	MN0070386	Beet Piling Grounds pond	0.39	1.0*	1.48*
				0.15**	0.22*

* Applicable when stream flow at the Rabbit River USGS gage 05051000 is equal to or greater than 12 cfs

** Applicable when stream flow at the Rabbit River USGS gage 05051000 is less than 12 cfs

Table 4: WWTF permittees Mustinka River Watershed used with Bois de Sioux River (09020101-501)

Facility	Permit Number	Annual Wet Weather Discharge Volume (mgd)	Daily TP WLA Concentration (mg/L)	Annual TP WLA Load (kg/yr)
Big Stone Hutterite Colony	MNG580168	0.0104	1.5	21.6
City of Dumont	MN0064831	0.0149	1.5	30.9
City of Elbow Lake	MNG580082	0.2079	2.0	574.4
City of Graceville	MNG580159	0.1256	2.0	347.0
City of Herman	MNG580177	0.1015	1.0	140.2
City of Wendell	MNG580153	0.0195	1.0	26.9
City of Wheaton	MN0047287	0.2350	0.5	162.3

Priority Ranking: Minnesota does not include separate priority rankings for its waters in the TMDL. The MPCA's projected schedule for TMDL completions, as indicated on the 303(d) impaired waters list, implicitly reflects Minnesota's priority ranking of these TMDLs. Ranking criteria for scheduling the TMDL projects include, but are not limited to: impairment impacts on public health and aquatic life; public value of the impaired water resource; likelihood of completing the TMDL in an expedient manner, including a strong base of existing data and restorability of the waterbody; technical capability and willingness locally to assist with the TMDL; and appropriate sequencing of TMDLs within a watershed or basin. Minnesota schedule of a 10-year watershed monitoring cycle is also used in the sequencing of TMDL development.

Future Growth/Reserve Capacity: Reserve capacity is an MPCA requirement to be considered and would be given an allocation of future growth when applicable. For the BdSRW MPCA has determined that a reserve capacity calculation is not applicable in this TMDL.

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

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

The TMDL submittal must include a description of the applicable State/Tribal water quality standard, including the designated use(s) of the water body, the applicable numeric or narrative water quality criterion, and the antidegradation policy. (40 C.F.R. §130.7(c)(1)). EPA needs this information to review the loading capacity determination, and load and wasteload allocations, which are required by regulation.

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

Comment:
Designated Use of Waterbody: The applicable water body classifications and water quality standards are specified in Minn. R. Ch. 7050. The Minn. R. Ch. 7050.0470 lists water body classifications and Minn. R. Ch. 7050.222 lists applicable water quality standards. The impaired waters covered in this TMDL are classified as Class 2B or 2C, 3B, 3C, 4A, 5, 6 and 7. Class 2B, and 2C are the most stringent Classes for this watershed. Table 1 above lists the appropriate impaired designated use for each waterbody.

Class 2B waters – 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.

Class 2C waters – The quality of Class 2C surface waters shall be such as to permit the propagation and maintenance of a healthy community of indigenous fish and associated aquatic life, and their habitats. These waters shall be suitable for boating and other forms of aquatic recreation for which the waters may be usable.

The water quality standards that apply to the BdSRW are shown in Tables 5 and 6 below.

Table 5: Surface water quality standards for Lakes in the BdSRW

Ecoregion/Type	Total Phosphorus Standard (µg/L)	Chlorophyll –a Standard (µg/L)	Secchi Depth Standard (m)	Period of Time Standard Applies
Northern Glaciated Plains: Shallow Lakes	< 90	< 30	> 0.7	June 1 – September 30

Table 6: Surface water quality standards for BdSRW stream reaches

Parameter	Water Quality Standard	Units	Criteria	Period of Time Standard Applies
E, coli Class 2 waters	Not to exceed 126	org/100 ml	Monthly geometric mean	April 1 – October 31
	Not to exceed 1,260	org/100 ml	To be exceeded no more than 10% of the time	
TSS *	65	mg/L	Not to be exceeded in more than 10% of the time	April 1 – September 30
DO	5	mg/L	Compliance with this standard is required 50 percent of the days at which the flow of the receiving water is equal to the 7Q10.	Year round
Eutrophication standards*			Exceedance of the total phosphorus levels and chlorophyll-a (seston), five-day biochemical oxygen demand (BOD), diel dissolved oxygen flux, or pH levels is required to indicate a polluted condition	Eutrophication standards are compared to summer-average data.
TP	≤ 150	µg/L		
chl-a	≤ 35	µg/L		
DO flux	≤ 4.5	mg/L		
Bod5	≤ 3.0	mg/L		

* Stream Eutrophication Standards (TP) and TSS are in South River Nutrient Region

Surrogate Target:

TP for DO

MPCA determined that low dissolved oxygen is related to the high phosphorus loadings (Section 2.2.4 of the TMDL Report). High phosphorus loads to the streams cause excessive production of algae and other plant growth. At night, bacterial, plant and animal respiration deplete oxygen. When algae and plant growth reach very high levels, the decomposition of and respiration from algae and aquatic plants can consume large amounts of DO resulting in stream DO levels that are too low to support fish. By controlling the phosphorus load, MPCA determined that the DO criteria will be met.

Other Targets:

TP (Lakes)

MPCA selected total phosphorus levels for the lakes as identified in Table 5 above to develop the eutrophication TMDLs for Ash Lake and Upper Lightening Lake (Section 1.4.5 of the TMDL Report). MPCA determined that by addressing the phosphorus levels in the lakes, the chl-a, as well as Secchi depth portions of the standard would be achieved. Algal abundance is measured by chl-a, which is a pigment found in algal cells. As more phosphorus becomes available, algae growth can increase. Increased algae in the water column decreases water clarity. Secchi depth is the measurement of the water clarity. By reducing the TP this will reduce the chl-a which in turn increases the Secchi depth readings of the lake.

TP (Rivers)

MPCA identified relationships between TP as the causal factor and the biological response variables (stressors) of sestonic chl-a, DO flux, and the 5-day biochemical oxygen demand (BOD5) in development of the stream eutrophication standard. Based on these relationships, it is expected that by meeting the TP target, the chl-a, DO flux, and BOD5 standards will likewise be met. DO flux is the magnitude of change in DO over the course of one day (daily maximum DO minus the daily minimum DO), and measures the amount of algal production in a stream, with large DO fluxes indicative of excess algal production and due to excess TP. The BOD5 is the 5-day biochemical oxygen demand and is another measure of excess algal production in a stream.

TSS

Turbidity is a measure of reduced transparency due to suspended particles such as sediment, algae, and organic matter. The Minnesota turbidity standard was 10 Nephelometric Turbidity Units (NTU) for class 2A waters and 25 NTU for class 2B waters. The state of Minnesota has amended state water quality standards and replaced stream water quality standards for turbidity with standards for TSS. Table 6 above identifies the new TSS standard for the streams in the BdSRW.

E. coli

The *E. coli* target for the streams in the BdSRW were set at the Class 2 WQS of 126 organisms per 100 mL geometric mean and the not-to-exceed 1,260 organisms per 100 mL (more than 10 percent of the time) as stated above, which is applicable from April 1st through October 31st. However, the focus of this TMDL is on the “chronic” standard of 126 org/100 mL (geometric mean portion). MPCA believes that the geometric mean is the more relevant value in determining water quality. While the TMDL will focus on the geometric mean portion of the WQS, compliance is required with both parts of the WQS as identified in Table 6 above.

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

3. Loading Capacity – Linking Water Quality and Pollutant Sources

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

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

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

TMDLs must take into account *critical conditions* for steam flow, loading, and water quality parameters as part of the analysis of loading capacity. (40 C.F.R. §130.7(c)(1)). TMDLs should define applicable *critical conditions* and describe their approach to estimating both point and nonpoint source loadings under such *critical conditions*. In particular, the TMDL should discuss the approach used to compute and allocate nonpoint source loadings, e.g., meteorological conditions and land use distribution.

Comment:
The TMDL summaries for the impaired waters in the BdSRW are found in Tables 7-14 at the end of this Decision Document.

Loading Capacity for Lakes:

The U.S. Army Corps of Engineers BATHTUB model was used in the determination of the loading for nutrients. The BATHTUB model applies a series of empirical equations derived from assessments of lake data and performs steady state water and nutrient calculations based on lake morphometry and tributary inputs. The BATHTUB model requires fairly simple inputs to predict phosphorus loading. The model accounts for pollutant transport, sedimentation, and nutrient cycling. The model was used to determine both the current load and the load needed to meet water quality standards for each lake.

The BATHTUB version 6.1 model framework was used as a basis for modeling phosphorus and water loading for lakes within the BdSRW. To calculate the P load capacity of each lake, external P inputs were reduced within the model until the predicted in-lake concentration matched the appropriate standard as identified in Table 5 above. The loading capacities and TMDL summaries for each lake are in Tables 7 and 8 of this Decision Document.

Loading Capacity for Streams:

Loading capacity for each pollutant in the streams (TP, TSS, and *E. coli*) utilized the Load Duration Curve (LDC) method.

Load duration analysis method: A flow duration curve was developed using the full range of hydrological conditions from data collected using April through October 1996 through 2009 daily average flow data. The resultant curve shows flow values and the frequency that the flow is exceeded. All flow conditions are represented.

Typically loading capacities are expressed as a mass per time (e.g. pounds per day). The loading capacity of TP and TSS were developed using a mass per time. However, for *E. coli* loading capacity calculations, mass is not always an appropriate measure because *E. coli* is expressed in terms of organism counts. This approach is consistent with the EPA's regulations which define "load" as "an amount of matter that is introduced into a receiving water" (40 CFR §130.2). To establish the loading capacities for the BdSRW bacteria TMDLs, MPCA used Minnesota's water quality standards for TP, (150µg/l), TSS (65 mg/l) and *E. coli* (126 cfu/100 mL). A loading capacity is, "the greatest amount of loading that a water can receive without violating water quality standards." (40 CFR §130.2). Therefore, a loading capacity set at the WQS will assure that the water does not violate WQS. MPCA's TMDL approach is based upon the premise that all discharges (point and nonpoint) must meet the WQS when entering the water body. If all sources meet the WQS at discharge, then the water body should meet the WQS and the designated use.

Flow zones were determined for very high, high, mid, low and very low flow conditions. The mid-range flow value for each flow zone was then multiplied by the standard to calculate the loading capacity. The method used for determining these TMDLs is consistent with EPA technical memos

The load duration curves were developed using the flow multiplied by the standard or target concentration. The curves in the TMDL Report represents the loads meeting the TP, TSS and *E. coli* criteria. The points above the curve are WQS exceedences. Review of the Load Duration Curves for the BdSRW the points for all pollutants were above the curve under all flow conditions indicating that the criteria load was exceeded in all conditions. Figures 48 - 52 of the TMDL report are the LDCs for the streams addressed in this TMDL for the BdSRW.

Tables 9-14 of 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 load duration curve method can be used to display collected bacteria monitoring data and allows for the estimation of load reductions necessary for attainment of the bacteria water quality standard. Using this method, daily loads were developed based upon the flow in the water body. Loading capacities were determined for the segment for multiple flow regimes. This allows the TMDL to be represented by an allowable daily load across all flow conditions. Although there are numeric loads for each flow regime, the LDC is what is being approved for this TMDL.

It is noted that *E. coli* has two parts to the standard, a monthly geometric mean and a maximum not to exceed. MPCA determined that the geometric mean portion of the WQS provides the best overall characterization of the status of the watershed. The EPA agrees with this assertion, as stated in the preamble of The Water Quality Standards for Coastal and Great Lakes Recreation Waters Final Rule (69 FR 67218-67243, November 16, 2004) on page 67224, "…the geometric mean is the more relevant value for ensuring that appropriate actions are taken to protect and improve water quality because it is a more reliable measure, being less subject to random variation, and more directly linked to the underlying studies on which the 1986 bacteria criteria were based."

Dissolved Oxygen

MPCA used the calibrated Hydrologic Simulation Program – FORTRAN (HSPF) to simulate non-permitted sources of total suspended sediment and TP in the BdSRW. The HSPF model has been used extensively in Minnesota and nationwide in support of TMDLs to simulate the complex nutrient cycling associated with TP, nitrogen, DO, algal growth, and biological oxygen demand. HSPF is a comprehensive model that simulates watershed hydrology and water quality for conventional and toxic pollutants. HSPF incorporates watershed-scale Agricultural Runoff Model (ARM) and non-point source (NPS) models into a basin-scale analysis framework that includes fate and transport in one dimensional stream channels. It accounts for a variety of runoff processes along with in-stream hydraulic and sediment-chemical interactions. Within a delineated subwatershed, areas with similar land uses are aggregated and a uniform set of parameter values are applied to that land category. Upland responses within a subwatershed are simulated on a per-acre basis and converted to net loads to stream reaches the upland represents. Within each subwatershed, the upland areas are separated into multiple land use categories.

MPCA determined that excess TP was identified as the primary stressor causing low DO in the TMDL. This is discussed in more detail in the *Bois de Sioux River Watershed - Watershed Restoration and Protection Strategy Stressor Identification Report* (SID report) under the conclusion discussions on pages 34-35 for Bois de Sioux River and pages 48-49 for the Rabbit River.

<u>Future Growth/Reserve Capacity</u>

Section 5 of the TMDL report discusses the process MPCA has laid out for considering new or expanding permitted MS4 WLA transfer process and new or expanding wastewater facilities (for TSS or *E. coli* only). While there are currently no MS4s in the BdSRW, in general, future transfer of watershed runoff loads in a TMDL study may be necessary if any of the following scenarios occur within the project watershed boundaries.

<u>Critical Condition:</u>

Total Phosphorus for Lakes

Water quality monitoring by MPCA in Ash and Upper Lighting Lakes suggests the in-lake TP concentrations vary over the course of the growing season (June – September), generally peaking in mid to late summer. MPCA developed the total phosphorus loading to meet the water quality standards during the summer growing season, the most critical period of the year.

Total Phosphorus and TSS for Streams
Critical conditions and seasonal variation in stream water quality are in this TMDL study using LDCs and the evaluation of load variability in five flow regimes, from high flows such as flood events, to low flows such as base flow.

E. coli in streams
The *E. coli* standard applies during the recreational period, and data were collected throughout this period. The water quality analysis conducted on these data evaluated variability in flow using five flow regimes: from high flows, such as flood events, to low flows, such as base flow. Using LDCs, *E. coli* loading was evaluated at actual flow conditions at the time of sampling (and by month), and monthly *E. coli* concentrations were evaluated against precipitation and stream flow.

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

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 non-point 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 non-point sources.

<u>Comment:</u>
<u>Load Allocation</u>: The load allocations are discussed in Section 3 of the TMDL report. MPCA determined nonpoint sources of TP, TSS and *E. coli*. TP nonpoint source loads included watershed runoff, loading from upstream waters, run off from feed lots, septic systems, atmospheric deposition, ground water and internal loadings for lakes. MPCA identified TSS nonpoint sources as mainly field runoff and streambank erosion (Section 3.6.2.2 of the TMDL Report). MPCA estimated the field erosion at approximately 80% and bank erosion at approximately 20%.

For *E. coli* in streams, MPCA determined that wildlife is likely the dominate source of *E. coli* (Section 3.6.3 of the TMDL Report). Other minor contributors that were identified were the illicit discharges from failing septic systems, pets, and livestock.

Although MPCA identified several land uses and processes that can contribute the pollutants, LAs were calculated as gross allocations.

MPCA determined available LAs by calculating the loading capacity and subtracting the wasteload allocations and a 10% margin of safety. Each load allocation includes nonpoint pollution sources that are not subject to an NPDES permit as well as "natural background" sources such as wildlife. Tables 7 through 14 at the end of this document identify the LA for each segment.

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

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:
NPDES permits- There is one WWTF permit, one CAFO and one permit related to beet piling grounds that discharge into the Rabbit River Reach 502. Calculation were also used from seven other NPDES permits outside the watershed that discharge upstream of the Boise de Sioux River Reach 501. The loads from the seven permits discharge to the Mustinka River, upstream of Mud Lake and were calculated to meet the Bois de Sioux River Reach 501. The loadings are identified in Table 4 above.

Minn-Dak Farmers' Cooperative is a sugar beet processing company that owns and operates five remote storage facilities (piling grounds) in Minnesota. The piling grounds are used for the temporary storage of sugar beets after harvesting, but prior to processing. The beet piling grounds/sites are designed to capture all liquid discharges in on-site industrial stormwater ponds. There is one pond at each piling site. Effluent from each pond is discharged through a pump discharge station at a rate of 500 gallons per minute (gpm) which is the rated pump capacity for all of the pumping systems at each site. Two piling grounds are located in a TP-impaired stream drainage area, but only one piling ground is hydrologically connected via surface water to the impaired stream (Section 4.1.3.5 of the TMDL Report). The WLA for this facility is found in Table 10 at the end of this document.

As discussed in Section 4.1.3.5 of the TMDL Report, MPCA will apply additional conditions to the discharge of the beet piling facilities. These discharges will be limited based upon the flow within the Rabbit River. The EPA notes that this TMDL approval only addressed the WLAs for each facility; the specific permit conditions will be addressed through the MPCA permit process.

Concentrated Animal Feeding Operations- There is one permitted CAFO in the watershed, the Chad Hasbargen Farm Sec 2 which is the Rabbit River subwatershed segment 502. Manure from this facility is applied to nearby fields. This application load is included in the loading portion of the calculation.

In accordance with the CAFO General Permit and individual permits, overflow events from CAFOs are allowable due to precipitation related overflows from CAFO storage structures which are properly designed, constructed, operated and maintained in accordance with CAFO permits. Discharges from such overflows are allowable only if they do not cause or contribute to a violation of water quality standards. MPCA determined a WLA = 0 for CAFOs in the basin. MPCA did note that manure spreading from CAFOs at agronomic rates are considered a non-point source of phosphorus and are included in the modeled non-point source loads in the TMDL calculations.

Regulated Construction Stormwater- Construction stormwater is regulated by NPDES/SDS permits for any construction activity disturbing: (a) one acre or more of soil, (b) less than one acre of soil if that activity is part of a "larger common plan of development or sale" that is greater than one acre, or (c) less than one acre of soil, but the MPCA determines that the activity poses a risk to water resources. The WLA for stormwater discharges, from sites where there are construction activities, reflects the number of construction sites greater than one acre in size that are expected to be active in the impaired lake or stream subwatershed at any one time. A categorical WLA was assigned to all construction activity in each impaired stream or lake subwatershed. A small WLA is set aside for activity under these general permits. Table 41 of the TMDL report identifies the average annual NPDES/SDS construction stormwater permit activity by county. Tables 9 through 14 identify the loads associated for each segment.

Regulated Industrial Stormwater- Industrial stormwater is regulated by NPDES permits if the industrial activity has the potential for significant materials and activities to be exposed to stormwater discharges. The WLA for stormwater discharges from sites where there is industrial activity reflects the number of sites in an impaired lake or stream subwatershed for which NPDES Industrial Stormwater Permit coverage is required. Tables 9 thorough 14 identify the loads associated for each segment.

MS4 communities- There are no MS4 communities in the watershed

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

6. Margin of Safety (MOS)

The statute and regulations require that a TMDL include a margin of safety (MOS) to account for any lack of knowledge concerning the relationship between load and wasteload allocations and water quality (CWA §303(d)(1)(C), 40 C.F.R. §130.7(c)(1)). EPA's 1991 TMDL Guidance explains that the MOS may be implicit, i.e., incorporated into the TMDL through conservative assumptions in the analysis, or explicit, i.e., expressed in the TMDL as loadings set aside for the MOS. If the MOS is implicit, the conservative assumptions in the analysis that account for the MOS must be described. If the MOS is explicit, the loading set aside for the MOS must be identified.

Comment:
For both lakes and streams an explicit MOS of 10% was used in the TMDL calculation.

Lakes- An explicit 10% MOS was accounted for in the TMDL for each impaired lake. This explicit MOS is considered to be appropriate based on: BATHTUB model calibration using added internal load with values typical of very shallow, eutrophic lakes (see Section 3.6.1.2of the TMDL Report), MPCA indicated that there was good agreement between BATHTUB model predicted and observed values indicating that the models reasonably reflect the conditions in the lakes and their subwatersheds; and MPCA used three or more years of in-lake water quality data used to calibrate the BATHTUB model.

Streams - An explicit MOS of 10% of the loading capacity was used for the stream TMDLs based on the determination that most of the uncertainty in flow is the result of extrapolating flows in upstream areas of the watershed based on HSPF model calibration at stream gages near the outlet of the BdSRW. The explicit MOS, in part, accounts for this; and the allocations are a function of flow, which varies from high to low flows. This variability is accounted for through the development of a TMDL for each of five flow regimes.

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

7. Seasonal Variation

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

Comment:
TP - During the growing season months (June through September), TP concentrations may not change drastically if major runoff events do not occur. However, chl-a concentrations may still increase throughout the growing season due to warmer temperatures fostering higher algal growth rates. In shallow lakes, the TP concentration more frequently increases throughout the growing season due to the additional TP load from internal sources. This seasonal variation is taken into account in the TMDL study by using the eutrophication standards (which are based on growing season averages) as the TMDL study's goals. The eutrophication standards were set with seasonal variability in mind. The load reductions are designed so that the lakes and streams will meet the water quality standards over the course of the growing season (June through September).

TSS - The TSS water quality standard applies for the period April through September, which corresponds to the open water season when aquatic organisms are most active and when high stream TSS concentrations generally occur. The TSS loading varies with the flow regime and season. Spring is associated with large flows from snowmelt, the summer is associated with the growing season as well as periodic storm events and receding stream flows, and the fall brings increasing precipitation and rapidly changing agricultural landscapes. The duration curve approach using multiple years of flow data and the applicable time period of the standard will provide sufficient water quality protection during the critical summer period

E. coli - Concentrations of *E. coli* varies throughout the summer in the BdSRW. While the standard is a geometric mean from April-October based on all available data in the impaired reach, June-September is the critical time period for exceedances of the *E. coli* standard in this watershed. The duration curve approach using multiple years of flow data and the applicable time period of the standard will provide sufficient water quality protection during the critical summer period.

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

8. Reasonable Assurances

When a TMDL is developed for waters impaired by point sources only, the issuance of a National Pollutant Discharge Elimination System (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:
Section 6 of the TMDL report discusses mechanisms that give reasonable assurance that the TMDL will be met. The majority of pollutant reductions in the BdSRW will need to come from NPS contributors in order for the impaired waters to meet water quality standards. MPCA indicated that in-lake load reductions will be achieved through management of a clear-water state. This has been most successful in southwest Minnesota via whole lake drawdowns, which consolidate sediments, reestablish plant communities, and kill the fish community (which is usually dominated by panfish that overgraze zooplankton). The BdSRW Watershed Restoration and Protection Strategies (WRAPS Report) addresses how to achieve the significant watershed load reductions needed in this watershed. As part of the WRAPS report, an agricultural conservation planning framework was used to identify nutrient reduction strategies at multiple scales (nutrient management, source control, in-field controls, edge of field controls, and in-stream controls).

Clean Water Legacy Act (CWLA): The CWLA was passed in Minnesota in 2006 for the purposes of

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

There are also local level activities that have take place in the watershed. The Bois de Sioux Watershed District (BdSWD) and the Grant, Otter Tail, Stevens, and Traverse County Soil and Water Conservation Districts (SWCD) currently implement programs that target improving water quality and have been actively involved in projects to improve water quality in the past. Willing landowners within this watershed have implemented many practices in the past including, conservation tillage, cover crops, buffer strips, gully stabilizations, and impoundments.

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 for each basin in the State. The WRAPS are required to contain such elements as the identification of impaired waters, watershed modeling outputs, point and nonpoint sources, load reductions, etc. (Chapter 114D.26; CWLA). The WRAPS also contain an implementation table of strategies and actions that are capable of achieving the needed load reductions, for both point and nonpoint sources (Chapter 114D.26, Subd. 1(8); CWLA). Implementation plans developed for the TMDLs are included in the table and are considered "priority areas" under the WRAPS process (Watershed Restoration and Protection Strategy Report Template, MPCA). This table includes not only needed actions but a timeline for achieving water quality targets, the reductions needed from both point and nonpoint sources, the governmental units responsible, and interim milestones for achieving the actions. MPCA has developed guidance on what is required in the WRAPS (Watershed Restoration and Protection Strategy Report Template, MPCA). Section 10 of this Decision Document identifies in greater detail the strategies in the WRAPS report. The WRAPS report for the Bois de Sioux River watershed was approved on April 8, 2020.

The Minnesota Board of Soil and Water Resources administers the Clean Water Fund as well, and has developed a detailed grants policy explaining what is required to be eligible to receive Clean Water Fund money (FY 2014 Clean Water Fund Competitive Grants Request for Proposal (RFP); Minnesota Board of Soil and Water Resources, 2014).

EPA finds that the TMDL document submitted by MPCA adequately addresses this eighth element.

9. Monitoring Plan to Track TMDL Effectiveness

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

Comment:
Section 7 of the TMDL report discusses the monitoring efforts that will continue in the watershed by MPCA based on MPCA's monitoring cycle set out in Minnesota's Water Quality Monitoring Strategy. MPCA employs an intensive watershed monitoring schedule that provides comprehensive assessments of all of the major watersheds (HUC 8 digit) on a ten-year cycle. This schedule provides intensive monitoring of streams and lakes within each major watershed to identify overall health of the water resources, to identify impaired waters, and to identify those waters in need of additional protection to prevent future impairments.

EPA finds that the TMDL document submitted by MPCA adequately addresses this ninth element.

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:
Activities envisioned to implement the TMDL are identified in Section 8 of the TMDL report. MPCA has developed the BdSRW WRAPS report, which details actions and activities to improve water quality and attain the appropriate WQSs. The purpose of the WRAPS report is to develop and present scientifically- and civically- supported restoration and protection strategies to be used for water and conservation planning and implementation in a watershed. It also summarized watershed approach work done to date. Below is a summary of the recommended strategies:

- Construction Stormwater - BMPs required under the permit, including those related to impaired waters discharges and any applicable additional requirements found in Appendix A of the Construction General Permit, the stormwater discharges would be expected to be consistent with the WLA in this TMDL study.
- Industrial Stormwater - If a facility owner/operator obtains stormwater coverage under the appropriate NPDES/SDS Permit and properly selects, installs, and maintains all BMPs required under the permit, the stormwater discharges would be expected to be consistent with the WLA in this TMDL study. All local stormwater management requirements must also be met.
- Best Management Practices – In field practices
    - Cover crops
    - Conservation tillage
    - Increasing organic matter
- Edge-of-field practices

- Water and sediment Control Basins
- Riparian Buffers

- Education and outreach

EPA finds that the TMDL document submitted by MPCA adequately addresses this tenth element. EPA review but does not approve implementation plans.

11. Public Participation

EPA policy is that there should be full and meaningful public participation in the TMDL development process. The TMDL regulations require that each State/Tribe must subject calculations to establish TMDLs to public review consistent with its own continuing planning process (40 C.F.R. §130.7(c)(1)(ii)). In guidance, EPA has explained that final TMDLs submitted to EPA for review and approval should describe the State's/Tribe's public participation process, including a summary of significant comments and the State's/Tribe's responses to those comments. When EPA establishes a TMDL, EPA regulations require EPA to publish a notice seeking public comment (40 C.F.R. §130.7(d)(2)).

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

Comment:
Section 9 of the TMDL report discusses public participation. There have been five civic engagement/public participation efforts sponsored by the MPCA and three technical committee meetings for the BdSRW. Tables 62 and 63 of the TMDL report identify these meetings.

MPCA held a public comment period on the TMDLs in this submittal from April 2, 2018 through June 4, 2018. MPCA received three comment letters on the TMDL and associated WRAPS report which were public noticed together. The State responded appropriately to these comments. Comments concerning the TMDL concerned the classification of the discharge from the Hawes Piling Grounds as a wastewater discharge and not an industrial stormwater discharge. The commenter indicated that the discharge was not accurately considered because it was not a continuous discharge. After further review and discussions with the commenter, MPCA has determined that discharges from the Hawes Piling Grounds should be characterized as industrial stormwater, not wastewater. WLAs for the Hawes Piling Ground were calculated based on the assumption that the discharge would consist of water and pollutants. The assumption used with respect to the volume of the discharge is consistent with a maximum 6"/day drawdown rate as specified in the Hawes Piling Ground's National Pollutant Discharge Elimination System (NPDES) permit.

Additional comments were submitted by the watershed district, and many of their comments were for clarifications to the TMDL report. EPA reviewed the comments and responses and determined that MPCA responded appropriately.

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

12. Submittal Letter

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

The submittal letter, whether for technical review or final review and approval, should contain such identifying information as the name and location of the water body, and the pollutant(s) of concern.

Comment:

The transmittal letter was dated April 15, 2020 from Glen Skuta, Divison Director, Water Division, MPCA, to Thomas Short, Acting Water Division Director, EPA Region 5. The letter stated that this was a TMDL submittal for final approval of TMDLs addressing impairments of stream aquatic life due to high total suspended solids (TSS) levels and high total phosphorus (TP) levels, stream aquatic recreation due to high *E. coli* levels, and lake aquatic recreation due to high TP levels for the Bois de Sioux River Watershed.

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

13. Conclusion

After a full and complete review, EPA finds that the TMDL for the BdSRW satisfies all of the elements of an approvable TMDL. This approval document is for eight TMDLs; two for TP in lakes, two TMDLs for TP in rivers, two TMDLs for TSS in rivers, and two TMDLs for E. coli in rivers. Table 1 above lists the impaired waters, pollutants and impairments addressed.

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

Table 7: Ash Lake (26-0294-00) TP TMDL and Allocations

Total Phosphorus		kg/day
Loading Capacity		**0.876**
Wasteload Allocation	*Construction Stormwater (MNR100001)*	*0.00007*
	Industrial Stormwater (MNR50000)	*0.00007*
	Total WLA	**0.0001**
Load Allocation*	*Watershed run-off*	*0.738*
	Atmospheric	*0.050*
	Total LA	**0.788**
MOS		**0.088**

* LA components are broken down for guidance in implementation planning; loading goals for these components may change through the adaptive implementation process, but the total LA for each lake will not be modified from the total listed in the table above. Other components considered livestock, failing septics, and internal loads each had zero loading.

Table 8: Upper Lightning Lake (56-0957-00) TP TMDL and Allocations

Total Phosphorus		kg/day
Loading Capacity		**2.192**
Wasteload Allocation	*Construction Stormwater (MNR100001)*	*0.0005*
	Industrial Stormwater (MNR50000)	*0.0005*
	Total WLA	**0.0010**
Load Allocation*	*Watershed runoff*	*1.417*
	Internal load	*0.355*
	Atmospheric	*0.201*
	Total LA	**1.972**
MOS		**0.219**

* LA components are broken down for guidance in implementation planning; loading goals for these components may change through the adaptive implementation process, but the total LA for each lake will not be modified from the total listed in the table above. Other components considered livestock and failing septics each had zero loading.

Table 9: Bois de Sioux River (09020101-501) TP TMDL and Allocations

Bois de Sioux River 09020101-501 Load Component		Flow Regime				
		Very High	High	Mid	Low	Very Low
		Total Phosphorus (kg/day)				
Loading Capacity		**810.8**	**250.4**	**47.9**	**4.6**	**0.4**
Wasteload Allocation	*Construction Stormwater (MNR100001)*	*0.075*	*0.031*	*0.005*	*0.0003*	*0.00001*
	Industrial Stormwater (MNR500000)	*0.075*	*0.031*	*0.005*	*0.0003*	*0.0001*
	Total WLA	**0.15**	**0.06**	**0.01**	**0.00006**	**0.00002**
Load Allocation	*Rabbit River (502)*	*261.2*	*31.9*	*10.7*	*4.0*	*0.1*
	*Watershed Runoff**	*468.4*	*193.4*	*32.4*	*0.1*	*0.3*
	Total LA	**729.6**	**225.3**	**43.1**	**4.1**	**0.4**
MOS		**81.1**	**25.0**	**4.8**	**0.5**	**0.04**

* The watershed runoff goal assumes that Mud Lake discharges at a growing season (June-September) average TP concentration of 150 ug/L. See Table 48 of the TMDL for Mud Lake suggested phosphorus load goals and reductions by pollutant source.

Table 10: Rabbit River (09020101-502) TP TMDL and Allocations

Rabbit River 09020101-502 Load Component		Flow Regime				
		Very High	High	Mid	Low	Very Low
		Total Phosphorus (kg/day)				
Loading Capacity		**290.2**	**35.4**	**11.9**	**4.4**	**0.34**
Wasteload Allocation+	*Campbell WWTF (MN0020915)*	*1.08*	*1.08*	*1.08*	*1.08*	*
	Hawes Piling Grounds (MN0070386)	*1.48*	*1.48*	*1.48*	*1.48*	*0.022*
	Construction Stormwater (MNR100001)	*0.038*	*0.004*	*0.001*	*0.0001*	*0.00001*
	Industrial Stormwater (MNR500000)	*0.038*	*0.004*	*0.001*	*0.0001*	*0.00001*
	Total WLA	**2.6**	**2.6**	**2.6**	**2.6**	**0.22**
Load Allocation	*Rabbit River (502)*	*261.2*	*31.9*	*10.7*	*4.0*	*0.1*
	*Watershed Runoff**	*468.4*	*193.4*	*32.4*	*0.1*	*0.3*
	Total LA	**258.6**	**29.3**	**8.1**	**1.4**	**0.09**
MOS		**29.0**	**3.5**	**1.2**	**0.4**	**0.03**

* See Section 4.1.3.5 for WLA methodology in the lower flow zones
+NPDES Permitted Feedlots were also considered however there was zero loading for this breakout of permits.

Table 11: Bois de Sioux River (09020101-501) TSS TMDL and Allocations

Bois de Sioux River 09020101-501 Load Component		Flow Regime				
		Very High	High	Mid	Low	Very Low
		Total Suspended Solids (kg/day)				
Loading Capacity		**351,354**	**107,916**	**20,412**	**2,008**	**184**
Wasteload Allocation+	*Construction Stormwater (MNR100001)*	*32.77*	*13.41*	*2.2*	*0.02*	*0.02*
	Industrial Stormwater (MNR500000)	*32.77*	*13.41*	*2.2*	*0.02*	*0.02*
	Total WLA	**65.5**	**26.8**	**4.4**	**0.04**	**0.04**
Load Allocation	*Rabbit River (502)**	*112,165*	*13,635*	*4,645*	*1,696*	*42*
	Watershed Runoff	*203,988*	*83,462*	*13,722*	*111*	*124*
	Total LA	**316,153**	**97,097**	**18,367**	**1,807**	**166**
MOS		**35,135**	**10,792**	**2,041**	**201**	**18**

* The load allocation for the Rabbit River (-502) is based on the sum of the WLA and LA from the Rabbit River (-502) TSS TMDL (see Table 12).

Table 12: Rabbit River (09020101-502) TSS TMDL and Allocations

Rabbit River 09020101-502 Load Component		Flow Regime				
		Very High	High	Mid	Low	Very Low
		Total Suspended Solids (kg/day)				
Loading Capacity		**124,628**	**15,150**	**5,160**	**1,884**	**47**
Wasteload Allocation+	*Campbell WWTF (MN0020915)*	*48.6*	*48.6*	*48.6*	*48.6*	*
	Hawes Piling Grounds (MN0070386)	*44.3*	*44.3*	*44.3*	*44.3*	*
	Construction Stormwater (MNR100001)	*16.6*	*1.9*	*0.6*	*0.2*	*0.01*
	Industrial Stormwater (MNR500000)	*16.6*	*1.9*	*0.6*	*0.2*	*0.01*
	Total WLA	**126.1**	**96.7**	**94.1**	**93.3**	*****
Load Allocation	*Rabbit River -South Fork (512)** *	*8,969*	*1,495*	*558*	*250*	*6*
	Watershed Runoff	*103,070*	*12,043*	*3,992*	*1,353*	*
	Total LA	**112,039**	**13,538**	**4,550**	**1,603**	*****
MOS		**12,463**	**1,515**	**516**	**188**	**5**

*The WLA for treatment facilities requiring NPDES permits is based on the design flow. The WLA exceeded Very Low flow regime TMDL allocation to the Rabbit River. The WLA and LA allocations are determined instead by the formula: TSS Allocation = (flow volume contribution from a given source) x (Daily TSS effluent limit in mg/L TSS from Table 53 in Section 4.2.3.5 of the TMDL report (WWTF design flows and permitted TSS loads).
** The load allocation for the Rabbit River, South Fork (-512) is based on the sum of the estimated WLA and LA from the Rabbit River, South Fork (-512) (note: the Rabbit River – South Fork TSS TMDL has been deferred until more data is available).

Table 13: Rabbit River (09020101-502) *E. coli* TMDL and Allocations

Rabbit River 09020101-502 Load Component		Flow Regime				
		Very High	High	Mid	Low	Very Low
		Billion organisms per day				
Loading Capacity		**2,434.8**	**303.1**	**103.8**	**38.0**	**1.4**
Wasteload Allocation+	*Campbell WWTF (MN0020915)*	*1.4*	*1.4*	*1.4*	*1.4*	*
	Total WLA	**1.4**	**1.4**	**1.4**	**1.4**	*****
Load Allocation	*Watershed Runoff*	*2,189.9*	*271.4*	*92.0*	*32.8*	*
	Total LA	**2,189.9**	**271.4**	**92.0**	**32.8**	*****
MOS		**243.5**	**30.3**	**10.4**	**3.8**	**0.1**

*The WLA for treatment facilities requiring NPDES permits is based on the design flow. The WLA exceeded Very Low flow regime TMDL allocation to the Rabbit River. The WLA and LA allocations are determined instead by the formula: *E. coli* Allocation = (flow volume contribution from a given source) x (126 org./100 ml *E. coli*).

Table 14: Doran Slough (09020101-510) *E. coli* TMDL and Allocations

Doran Slough 09020101-510 Load Component		Flow Regime				
		Very High	High	Mid	Low	Very Low
		Billion organisms per day				
Loading Capacity		**111.9**	**20.6**	**7.0**	**3.6**	**0.6**
Wasteload Allocation[+]	**Total WLA**	0	0	0	0	0
Load Allocation	*Watershed Runoff*	*100.7*	*18.5*	*6.3*	*3.2*	*0.5*
	Total LA	**100.7**	**18.5**	**6.3**	**3.2**	**0.5**
MOS		**11.2**	**2.1**	**0.7**	**0.4**	**0.1**