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

JUN 27 2019

REPLY TO THE ATTENTION OF

WW-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 conducted a complete review of the seven final Total Maximum Daily Loads (TMDLs) for the Two Rivers Watershed, located in Kittson and Roseau Counties, MN. The TMDLs are calculated for Total Suspended Solids and *E. Coli*, and address impairments to Aquatic Life and Aquatic Recreation designated uses.

EPA has determined that these 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 seven TMDLs for the Two Rivers Watershed. 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 addressing aquatic life and recreational uses, and look forward to future submissions by the State of Minnesota. If you have any questions, please contact Mr. David Pfeifer, Acting Chief of the Watersheds and Wetlands Branch, at 312-353-9024.

Sincerely,

Joan M. Tanaka

Joan M. Tanaka
Acting Director, Water Division

Enclosure

cc: Celine Lyman, MPCA
Danielle Kvasager, MPCA

wq-iw5-14g

Final Decision Document

Two Rivers Watershed TMDL

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.

This document is a final review and decision of the TMDL Document titled:

Two Rivers Watershed
Total Maximum Daily Load Report
Dated: June 2019

General Review Comments:

Overall the TMDL document demonstrates an extensive understanding of the dynamics of the watershed and a quantitative understanding of the pollutant sources and how they contribute to impairment. Information contained in Figure 3-16, 3-17, and 3-18 of the TMDL document provide valuable insights into the nature and magnitude of the different pollutant sources that should prove useful in selecting and implementing future best management practices.

Section 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* and phosphorus loadings for excess algae; length of riparian buffer; or number of acres of best management practices.

Section 1 Review Comments:

The waterbodies are identified as they appear on the 303(d) list and information is provided to locate the waterbodies within the drainage basin.

TMDL Review Table 1 shows waterbody and impairment information excerpted from the TMDL document. The information in Table 1 is consistent with the Minnesota 2018 303(d) Impaired Waters List.

TMDL Review Table 1 - Summary Info Excerpted from Final TMDL Document

AUID/ Lake ID	Affected Use	Pollutant	Appendix A Figure & Table(s)	TMDL Table #	Stream or Lake Name	Location/Reach Description	Designated Use Class	Listing Year	Target Completion Year
09020312-501	Aquatic Life	TSS	Figure 10 Table 15	Tbl 4-14	Two Rivers	M Br Two R to N Br Two R	2B, 3C	2006	2018
09020312-509	Aquatic Life	TSS	Figure 9 Tables 14	Tbl 4-15	Two Rivers	N Br Two R to Red R	2B, 3C	2008	2018
09020312-501	Aquatic Recreation	E-coli	Figure 4 Tables 4 and 5	Tbl 4-5	Two Rivers	M Br Two R to N Br Two R	2B, 3C	2010	2018
09020312-503	Aquatic Recreation	E-coli	Figure 5 Tables 6 and 7	Tbl 4-6	Two River, Middle Branch	CD23 to S Br Two R	1C, 2Bd, 3C	2016	2018
09020312-505	Aquatic Recreation	E-coli	Figure 6 Tables 8 and 9	Tbl 4-7	Two River, South Branch	Lateral Ditch 2 to Lk Bronson	1C, 2Bd, 3C	2016	2018
09020312-506	Aquatic Recreation	E-coli	Figure 7 Tables 10 and 11	Tbl 4-8	Two River, South Branch	Unnamed ditch to Lateral Ditch 2 SD 95	1C, 2Bd, 3C	2016	2018
09020312-535	Aquatic Recreation	E-coli	Figure 8 Tables 12 and 13	Tbl 4-9	County Ditch 13	Unnamed ditch to Badger Cr (disconnected portion)	2B, 3C	2016	2018

Additional locational information is presented in Table 3-1, Figure 1-1, and Figure 3-2 of the TMDL document.

Table 3-1: Impaired stream reaches drainage areas.

HUC 10 Subwatershed	AUID (09020312-XXX)	Stream Name	Location/Reach Description	Total Drainage Area (acres)	Noncontributing Area (acres)[1]	Upstream Waterbody (AUID 09020312-XXX)
State Ditch No 95 (0902031202)	505	Two River, South Branch	Lateral Ditch 2 to Lk Bronson	50,555	3,336	506, 513, 521
	506	Two River, South Branch	Unnamed ditch to Lateral Ditch 2 SD 95	344,400	1,527	507, 516
	535	County Ditch 13	Unnamed ditch to Badger Cr (disconnected portion)	13,462	0	534, 541
Middle Branch Two Rivers (0902031203)	503	Two River, Middle Branch	CD23 to S Br Two R	36,787	35	518
South Branch Two Rivers (0902031207)	501	Two Rivers	M Br Two R to N Br Two R	49,071	4,569	502, 503, 512
	509	Two Rivers	N Br Two R to Red R	719,200	4,678	501

[1]Based on the 10-year, 24-hour rainfall event.

Excerpted from the TMDL document

The TMDL identifies the priority ranking of the waterbody

TMDL Review Table 1 provides information on the priority ranking of the waterbody pollutant combinations found in the TMDL document and additional information is presented in Section 1.3.

> *The MPCA's schedule for TMDL completions, as indicated on the approved 2018 303(d) impaired waters list, reflects Minnesota's priority ranking of this TMDL. The MPCA has aligned TMDL priorities with the watershed approach and our WRAPS cycle. The schedule for TMDL completion corresponds to the WRAPS report completion on the 10-year cycle. The MPCA developed a state plan Minnesota's TMDL Priority Framework Report to meet the needs of EPA's national measure (WQ-27) under EPA's Long-Term Vision for Assessment, Restoration and Protection under the Clean Water Act Section 303(d) Program. As part of these efforts, MPCA identified water quality impaired segments that will be addressed by TMDLs by 2022. TRW waters addressed by this TMDL are part of that the MPCA prioritization plan to meet the EPA's national measure. [Excerpted from the TMDL document]*

The TMDL clearly identifies the pollutant(s) for which the TMDL is being established.

The TMDL clearly identifies Total Suspended Solids as the pollutant for the waterbodies identified as impaired for aquatic life due to excess turbidity.

The TMDL clearly identifies *E. coli* as the pollutant for the waterbodies identified as impaired for aquatic recreation.

Table 1-1 of the TMDL document presents a number of additional impairments to assessment units within the Two Rivers Watershed that are not addressed by this TMDL document, including aquatic life impairments related to low dissolved oxygen, and fish and macroinvertebrate bioassessment results.

The Link between the pollutant of concern (POC) and the water quality standard is specified.

Numerical concentration criteria for the pollutant of concern are directly specified in the State's water quality standards and provided in Table 2-1 of the TMDL document. Additional discussion of the designated uses and classifications of the waterbodies in question are provided in Section 2 of the TMDL document.

Table 2-1: Surface water quality standards for TRW stream reaches addressed in this TMDL report.

Parameter	Water Quality Standard	Units	Criteria	Period of Time Standard Applies
Escherichia coli (*E. coli*)	Not to exceed 126	org/100 mL	Monthly geometric mean	April 1-October 31
	Not to exceed 1,260	org/100 mL	Upper 10th percentile	
Total suspended solids (TSS)- Southern Nutrient Region	Not to exceed 65	mg/L	Upper 10th percentile	April 1 – September 30

Excerpted from the TMDL document

Waters within Indian Country, (as defined in 18 U.S.C. Section 1151) and/or other jurisdictional areas are identified and discussed.

(Tribal and other non-State jurisdictional lands and waters within or adjacent to the watersheds should be identified and any impacts discussed. If no lands and/or waters are within or adjacent to Indian Country this should be stated in the document.)

The document states in Section 3 that no tribal lands fall within the boundaries of the watershed.

> *No part of the TRW is located within the boundary of a Native American Reservation recognized by the federal government.*
> *[Excerpted from the TMDL document]*

A small portion of the watershed lies outside the jurisdiction of the United States. This is noted

and addressed in the executive summary of the TMDL document.

> *There are an additional 3.6 square miles of this watershed that extend into Canada, but TMDLs in this report do not apply within the jurisdiction of Canada and meeting the goals of the TMDL is not dependent upon obtaining reductions from the portion of the watershed in Canada.*
> *[Excerpted from the TMDL document]*

The location and quantity of point and non-point sources are identified.

E. coli source assessment.

A four-step process for assessing and quantifying nonpoint source *E. coli* inputs to the impaired segments is identified in Section 3.6.1 of the TMDL document.

1. *Identify and estimate magnitude (i.e., production rate) of potential bacteria sources that may contribute E. coli in the TRW. These sources include humans (subsurface sewage treatment systems [SSTS], WWTF*), companion animals (cats and dogs), livestock (cows, chickens, goats, hogs, horses, sheep, and turkeys), and wildlife (deer, ducks, geese, and others). Once the population contributing bacteria have been identified, population estimates were obtained from the various sources provided in the following sections.*
2. *Each source is assigned a bacteria production rate (see Table 3-6), based on literature values. These bacteria yields are then applied to the relevant areas, described in the following sections.*
3. *Apply an empirical downstream delivery factor, representing die-off and based on water travel time, to the bacteria production rates across the TRW. This delivery factor accounts for the fate and transport of bacteria from the source to the impaired waterbody.*
4. *Finally, the total bacteria load was estimated by summing the bacteria production with the delivery factor applied to estimate the relative loads for each identified source. A ranking was applied based on percentage of total bacteria load.*
[Excerpted from the TMDL document]

* The EPA notes that the calculations for WWTFs are calculated based upon the permitted effluent limit as discussed in Section 5 of this Decision Document.

Table 3-6: Bacteria production rates by source.

Source	Producer	Fecal Coliform Production Rate [billion (10^9) org/day-head]	*E. coli* Production Rate [billion (10^9) org/day-head][1]	Reference[1]
Humans	Humans	2	1.3	Metcalf and Eddy 1991
	Domestic Animals	5	3.2	Horsley and Witten 1996
Livestock	Cattle	5.4	3.4	Metcalf and Eddy 1991
	Hogs	8.9	5.6	Metcalf and Eddy 1991
	Sheep and Goats	18	11.3	Metcalf and Eddy 1991
	Poultry	0.24	0.15	Metcalf and Eddy 1991
	Horses	4.2	2.6	ASAE 1998
Wildlife	Deer	0.36	0.2	Zeckoski et al. 2005
	Geese	4.9	3.1	LIRPB 1978
	Ducks	11	6.9	Metcalf and Eddy 1991
	Other (e.g. feral cats, raccoons, etc.)	5	3.2	Yagow 2001

[1]Literature rates are provided as fecal coliform, estimates for *E. coli* rates are based on fecal coliform estimates and conversion factor of 0.63, based on the conversion of the fecal coliform standard and *E. coli* standard.

Excerpted from the TMDL document

The data and assumptions used in the 4-step process are presented and discussed throughout Section 3.6.1 of the TMDL document. Additional comments and discussion on those assumptions are included below. The overall result of the *E. coli* source assessment is presented in Table 3-13 of the TMDL document as a relative ranking of the respective sources to the impaired reaches.

Table 3-13: Relative sources of *E. coli* in the TRW.

Assessment Unit Identification	Humans				Livestock				Wildlife					Upstream Sources	
	All	WWTF Effluent	Septic Systems	Domestic Animals	All	Grazing	Manure	Feedlot Open Lots	All	Deer	Ducks	Geese	Other	Level	Estimated Percentage
501	○	○	○	○	●	●	●	●	○	○	○	○	○	●	87%
503	○	○	○	○	●	●	⭘	⭘	○	○	○	○	○		NA
505	○	○	○	○	●	●	●	●	○	○	○	○	○	●	90%
506	○	○	○	○	●	●	●	●	○	○	○	○	○		NA
535	○	○	○	○	●	●	●	●	○	○	○	○	○		NA

Key: ● = high risk, ⭘ = medium risk, ○ = low risk

Excerpted from the TMDL document

The magnitude of the bacteria sources were placed into one of three categories: low, medium, and high. The rankings are based on the percentage of total bacteria load for each potential source. The sources were categorized into 10 groups. If all 10 potential

sources contributed equally, they should each contribute 10% of the total load. As such, we ranked potential sources contributing 5% to 20% of the total load as a medium risk, or half to twice the expected value. If the source of bacteria was less than 5% of the total load, a rank of low was assigned and if greater than 20% a rank of high was assigned. The rankings for the TRW were all relative to the delivery of E. coli to the TRW outlet. [Excerpted from the TMDL document]

Natural Background Inputs- E. coli Source Assessment:

Natural Background inputs were not separately quantified due to a lack of available data, however Section 3.6 of the TMDL document does provide a qualitative discussion of the expected magnitude of natural background inputs relative to other pollutant sources in the watershed.

For each impairment, natural background levels are implicitly incorporated in the water quality standards used by the MPCA to determine/assess impairment and therefore natural background is included in MPCA's waterbody assessment process. No data were available to evaluate natural background conditions explicitly. The position of the MPCA is that the source assessment exercises indicate natural background inputs are generally low compared to livestock, cropland, streambank, WWTFs, failing SSTSs, and other anthropogenic sources. Based on the MPCA's waterbody assessment process and the TMDL source assessment exercises, there is no data to assess whether natural background sources are a major driver of any of the impairments and/or affect the waterbodies' ability to meet state water quality standards. For all impairments addressed in this TMDL study, natural background sources are implicitly included in the LA portion of the TMDL allocation tables and TMDL reductions should focus on the major anthropogenic sources identified in the source assessment.
[Excerpted from the TMDL document]

WWTP Sources - E. coli Source Assessment:

Table 3-7 of the TMDL document identifies 5 Permitted WWTP within the Two Rivers Watershed as sources of *E. coli* and provides permit numbers for each. Since facility permits are specified in terms of fecal coliform concentrations, a standard conversion factor of 126 *E. coli* bacteria per 200 fecal coliform bacteria is applied to convert from the fecal coliform to *E. coli* before daily loading rates are provided for each facility.

Permitted Municipal Separate Storm Sewer Systems - E. coli Source Assessment:

The TMDL document states that there are no permitted MS4s in the Two Rivers Watershed and no source assessment or load allocation is made for MS4s.

Concentrated Animal Feeding Operation (CAFO) – E. coli source Assessment:

MPCA identified two facilities that are large enough to meet the definition of a CAFO (Section 3.6.1.1 of the TMDL). One facility currently has a NPDES permit. High Prairie Dairy has 2,240 AUs of dairy cows and holds NPDES Permit MNG440499. It is located in the North Branch Two Rivers Subwatershed (0902031206), which is within the drainage basin of one of the AUIDs that has an impairment addressed in the TMDL (09020312-509). However, this is a zero discharge facility and

therefore is not given a WLA in the TMDL.

Watershed Surface Runoff Loading - E. coli Source Assessment:

Non-point sources of *E. coli* are identified as companion animals such as domestic dogs and cats, feral cats, livestock, and wildlife.

Production rates for *E. coli* sources were estimated based on EPA's Protocols for Developing Pathogen TMDLs (EPA 2001).

Table 3-7: Wastewater treatment facilities, permitted flows, and bacteria loads for minor facilities in the TRW.

Facility	Permit Number	Discharges to	City / Township	System Type	Permitted Daily Discharge Flow [mgd]	Equivalent Bacteria Load as *E. coli*: 126 org/100mL [billion org/day]
Badger	MNG580155	Unnamed ditch	Badger	Class D: 3-cell pond	0.37	1.79
Greenbush	MNG580156	Lateral Ditch #2	Greenbush	Class D: 2-cell pond	2.28	10.88
Hallock	MNG580147	Unnamed Ditch	Hallock	Class D: 3-cell pond	1.56	7.46
Lake Bronson	MNG580029	Two Rivers, South Branch	Lake Bronson	Class D:2-cell pond	0.44	2.10
Lancaster	MNG580066	Coulee Creek	Lancaster	Class D: 2-cell pond	0.41	1.94

Excerpted from the TMDL document

> *The EPA's Protocols for Developing Pathogen TMDLs (EPA 2001) provides estimates for bacteria production rates for most animals shown in Table 3-6. Bacteria production rates were based on estimated bacteria content in feces and average excretion rates, expressed as units of colony forming units (cfu) per day per head (individual). Production rates are usually provided as fecal coliform; therefore, a conversion factor of 0.63 was used to convert fecal coliform to E. coli. The conversion factor is based on the ratio of the previous fecal coliform standard (200 org/100 mL) to the current E. coli standard (126 org/100 mL).*
> *[Excerpted from the TMDL document]*

Additional detailed information on livestock and agricultural related sources is presented in Table 3-11 of the TMDL document.

Livestock populations were estimated for cattle, chickens, goats, horses, sheep, and turkeys for each county and are provided in Table 3-11. Although the MPCA's geographic

Table 3-11: Livestock population estimates (numbers) in the TRW.

Animal	Type	Kittson	Marshall	Roseau
Cattle	Beef	6,128	52	4,759
	Cattle on Feed	221	2	198
Other	Pigs	20	0	2,531
	Sheep and Goats	140	10	610
	Horses	125	3	242
Poultry	Layers	118	4	216
	Boilers	82	2	70
	Turkey	0	0	70,832
	Ducks and other	1	0	4

Excerpted from the TMDL document

feedlot database developed for registered and NPDES permitting provide location and allowable populations of animals, these populations are the maximum allowable populations under the permits and are not the actual populations at these sites. Therefore, the USDA census data was used to estimate livestock populations. [Excerpted from the TMDL document]

MPCA considered wildlife sources separately from natural background. The relative contribution of *E. coli* from different wildlife sources is dependent on the number of animals, their respective *E. coli* production rates, and the differing rates of *E. coli* delivery to the waterbodies. The final delivery rate of *E. coli* for each species depends on the species relative distribution in the watershed and their general proximity of excretion to the impaired reaches. Information about the relative abundance of different species and their distribution throughout the watershed is provided in Table 3-12 of the TMDL document.

The methodology for estimating the delivery of bacteria from the sources, through the watershed to the waterbodies and accounting for die off along the route is based on EPA's protocol for developing Pathogen TMDLs and as explained in the TMDL document.

The EPA's Protocols for Developing Pathogen TMDLs provides a methodology for estimating bacteria die-off and lists coefficients for die-off calculations (EPA 2001). The die-off equation was given as:

$C = C\exp(-KT_t)$

Where C is the concentration of bacteria (cfu/day), C_0 is the initial concentration of bacteria (cfu/day), K is the decay (die-off) coefficient (1/day), and T_t is travel time (days). The die-off coefficient for natural surface water used in the TRW was 0.202 days-1 (essentially meaning about 20% per day). The die-off equation was applied to a water travel-time grid for the watershed as a whole and each impaired reach to estimate the delivery factor. An assumption is that the time of travel through the watershed by

bacteria is the same as water.
[Excerpted from the TMDL document]

Table 3-12: Data sources and assumption for wildlife population and bacteria delivery.

Bacteria Source	Delivery
Deer The DNR report "Status of Wildlife populations, Fall 2009" includes a collection of studies that estimate wildlife populations of various species (Dexter 2009). Pre-fawn deer densities (in deer per square mile) were reported by DNR deer permit area.	Bacteria from deer were applied to all land use classes in the NLCD 2011 dataset except for open water and developed land use classes.
Ducks Populations of breeding ducks was taken from the U.S. Fish and Wildlife "Thunderstorm" Maps for the Prairie Pothole Region of Minnesota and Iowa	The USFW "Thunder Maps" are spatially distributed and were used once a bacteria production rate was applied.
Geese Population estimates were taken from the state-wide DNR's Minnesota Spring Canada Goose Survey, 2009 (Rave 2009). Counts were reported by Level I Ecoregion. An area-weighted estimate was taken from the state-wide data, resulting in an estimate of 1,568 geese in the TRW.	Bacteria from geese were distributed to areas within a 100 ft buffer of and including wetlands and open water classes in the NLCD 2011 dataset.
Other Wildlife Other wildlife in the TRW includes such animals as swallows, beaver, raccoons, coyote, foxes, and squirrels. Instead of estimating individual populations of each type of wildlife within the TRW. The bacteria production was assumed to be the same as the bacteria production from deer. Therefore, the bacteria production from deer was doubled to account for all other wildlife in the watershed that are not accounted for explicitly.	Same as deer.

Excerpted from the TMDL document

Subsurface Sewage Treatment Systems (Septic Systems) - E. coli Source Assessment:

Failing septic systems are identified as a potential source of *E. coli* in the Two Rivers Watershed with estimates of the number of failing systems provided in Table 3-8 of the TMDL document

Of the rural population in the TRW, an estimated 126 systems have inadequate treatment of household wastewater.
[Excerpted from the TMDL document]

Table 3-8: SSTS compliance status in the TRW.

	Kittson	Roseau	Marshall
Identified # of SSTSs	538	1,165	14
# of potentially failing SSTSs	48	0	3
# of potential IPHTs	27	47	1

Excerpted from the TMDL document

TSS Source Assessment:

NPDES WWTP- TSS Source Assessment:

There are five WWTP identified and allocated waste load as part of the TMDL.

> *The TRW contains five "minor" (as defined by the MPCA) WWTFs that drain into impaired streams. These WWTFs are all pond-type plants with primary and secondary treatment ponds. Per their permits, these WWTFs are allowed to discharge only during certain time periods during the year: March 1 through June 30 and September 1 through December 31. The WWTFs are listed in Table 3-14.*
> *[Excerpted from the TMDL document]*

Table 3-14: Relevant WWTF permits in the TRW.

			A				
Facility	NPDES Permit Number	System Type	Secondary Pond Size (acres)	Operating Depth (ft)	Average Wet Weather Design Flow (gpd)	Permitted Max Daily Discharge (gpd)[1] (A*0.163*10^6)	Permitted Calendar Month Average[2,3] (kg/day)
Badger	MNG580155	Class D: 3-cell pond	2.3	4	55,000	374,729	63.7
Greenbush	MNG580156	Class D: 2-cell pond	14	3	114,000	2,280,960	388
Hallock	MNG580147	Class D: 3-cell pond	9.6	4	200,000	1,564,087	266
Lake Bronson	MNG580029	Class D: 2-cell pond	2.7	4	35,000	439,899	74.9
Lancaster	MNG580066	Class D: 2-cell pond	2.5	3.5	55,000	407,314	69.3

[1] Computed based on the average surface area of the secondary treatment pond size and an assumed maximum daily discharge of six inches per day.
[2]Assumes twice annual maximum discharges to completely drain secondary pond (i.e. 2* 6 inches per day * operating depth*daily WLA)
[3]Calender Month Average load used per MPCA guidance.
Excerpted from the TMDL document

Non-Point Sources - TSS Source Assessment:

The TMDL document identifies three main categories of non-point suspended sediment sources, upland field erosion, wind erosion, and in-channel stream bank and bluff erosion. The HSPF Model is used to estimate the loading of sediment to the impaired stream reaches. The results of the HSPF modeling is provided in Figure 3-16 in terms of the average yield of tons of sediment per year.

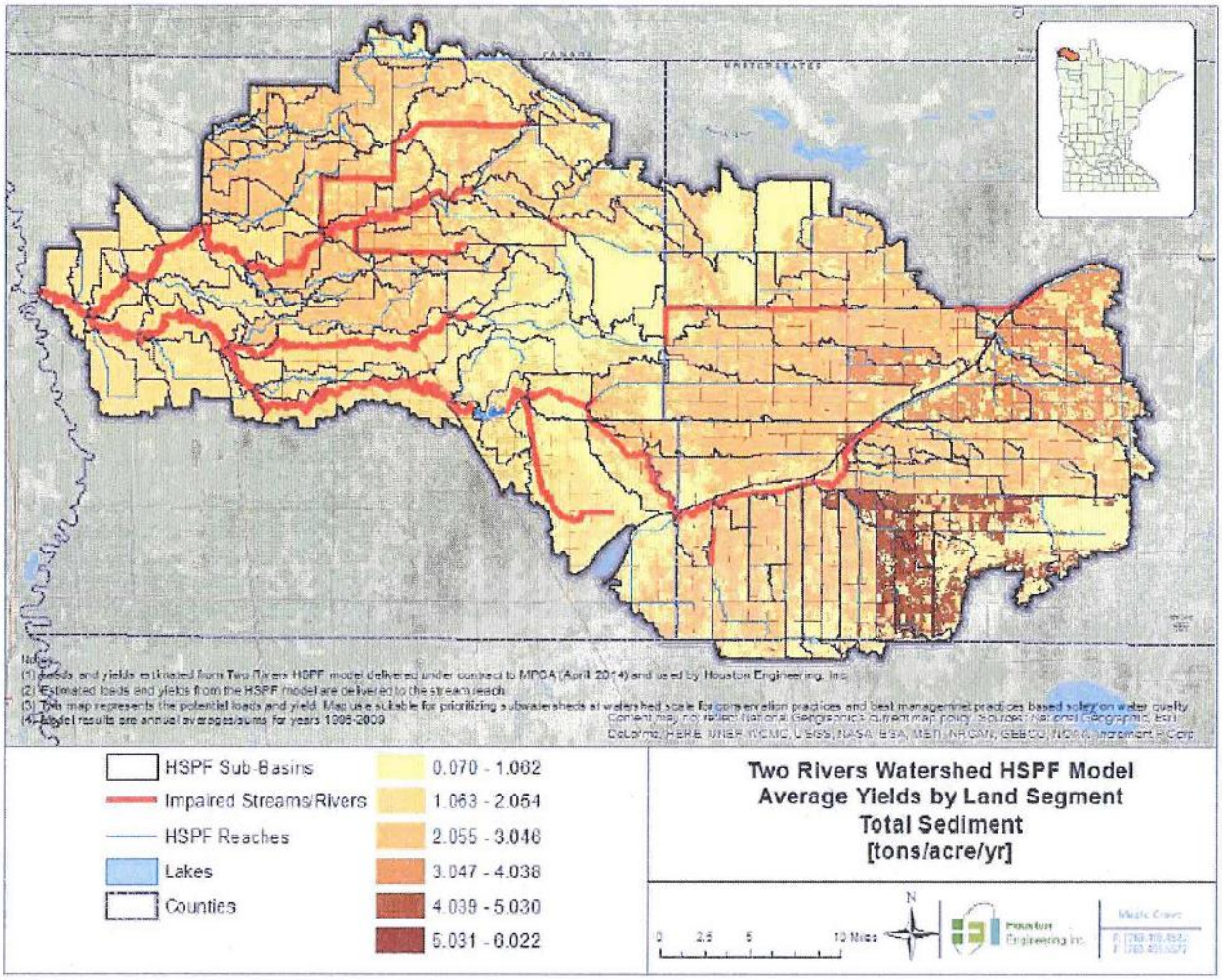

Figure 3-16: Total Sediment Yields from the landscape as estimated by the TRW HSPF model.

Excerpted from the TMDL document

Utilizing the HSPF model results, a parameter is derived which the TMDL document refers to as a Field Stream Index. This index integrates information on the relative contribution of sediment from field sources vs instream and bank erosion as well as indicates whether a given reach of stream is a net source or net sink of sediment relative to the stream system as a whole.

> *To show the relative magnitude of field sources of sediment to in-stream sources, a field-stream index (FSI) was developed using results from the HSPF model (Figure 3-17). The FSI is an indicator based on the ratio of the total surface runoff sediment load (i.e., overland or field load) reaching a stream reach from the direct drainage area divided by the in-stream sediment flux (within a stream reach). The total surface runoff sediment is the sediment entering the channel in the specific subwatershed and represented in the HSPF model as entering the upstream end. The in-channel sediment load is taken as the flux of sediment in the sediment reach of the subwatershed, where positive numbers equate to a sediment source (i.e. more sediment leaves the reach than comes in) and*

negative numbers equates to a sediment sink (i.e. more sediment enters the reach than leaves). The FSI indicates dominant sediment process within a stream reach. Positive FSI indicates the stream reach is a source of sediment and a negative FSI indicates the stream reach is a sediment sink. If the FSI is between -1 and 1, in-stream processes as a source of are more dominant than surface runoff sources. If the FSI is less than -1 or greater than 1, surface runoff sources are larger in magnitude. For example, if a stream reach has an FSI of -2, the stream reach is a sink for sediment and surface runoff is two time larger than in channel sediment sources. The FSI highlights areas within the watershed, where in-stream processes are dominant and areas where field processes are more important and where implementation of in-channel practices might be more important than field practices, or vice versa. The FSI for sediment, in the TRW, is shown in Figure 3-17.

[Excerpted from the TMDL document]

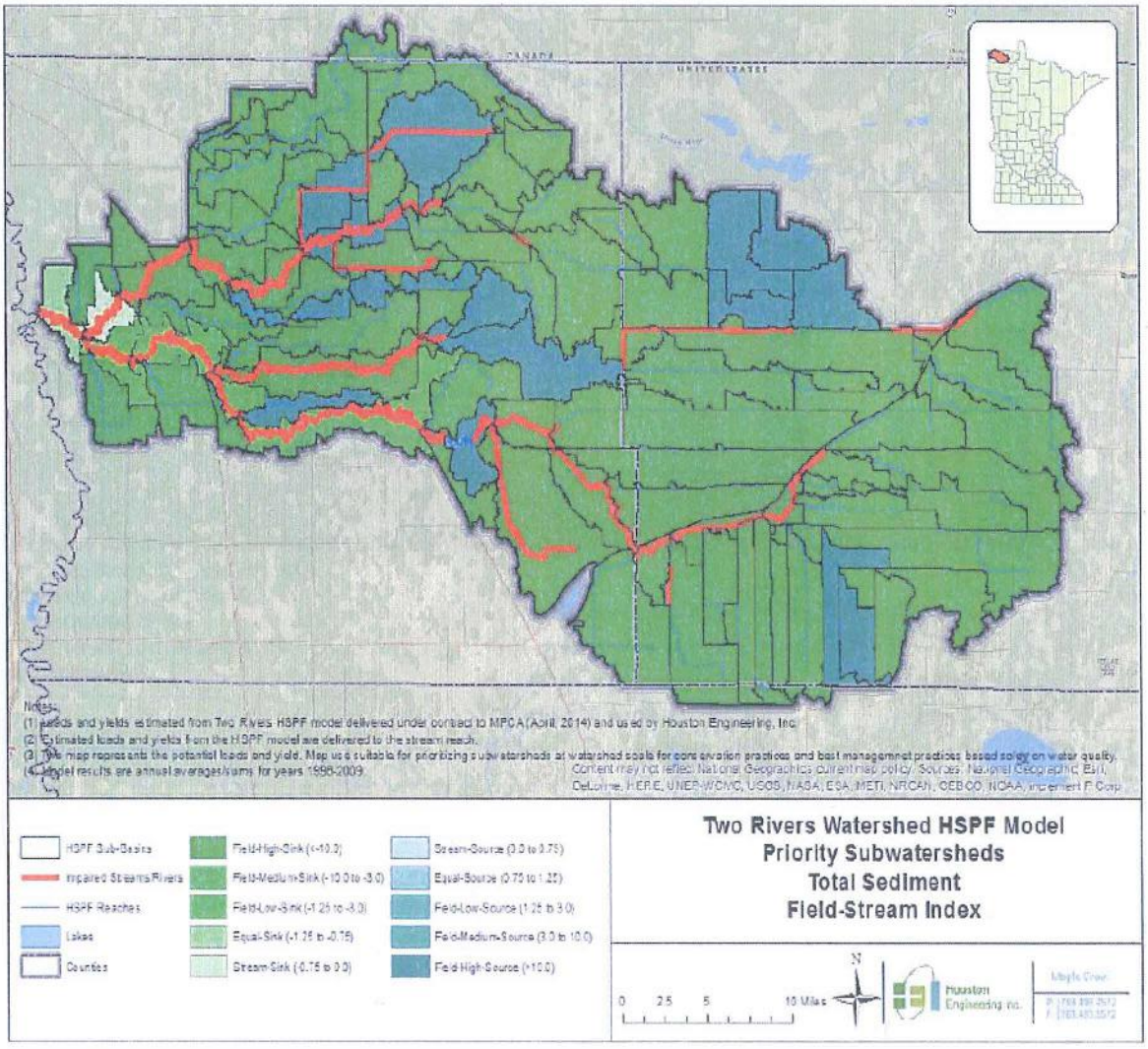

Figure 3-17: Total Sediment Field Stream Index using HSPF model results.

Excerpted from the TMDL document

Figure 3-18 of the TMDL document shows a priority ranking of the subwatersheds based on the net sediment yields.

> *Figure 3-18 shows priority ranking of subwatershed in the TRW, the darker grey-green colors represent subwatersheds with stream reaches that, on an annual average, supply the highest yield of sediment. The lighter grey-green colors represent subwatersheds where sediment yields are the lowest.*
> *[Excerpted from the TMDL document]*

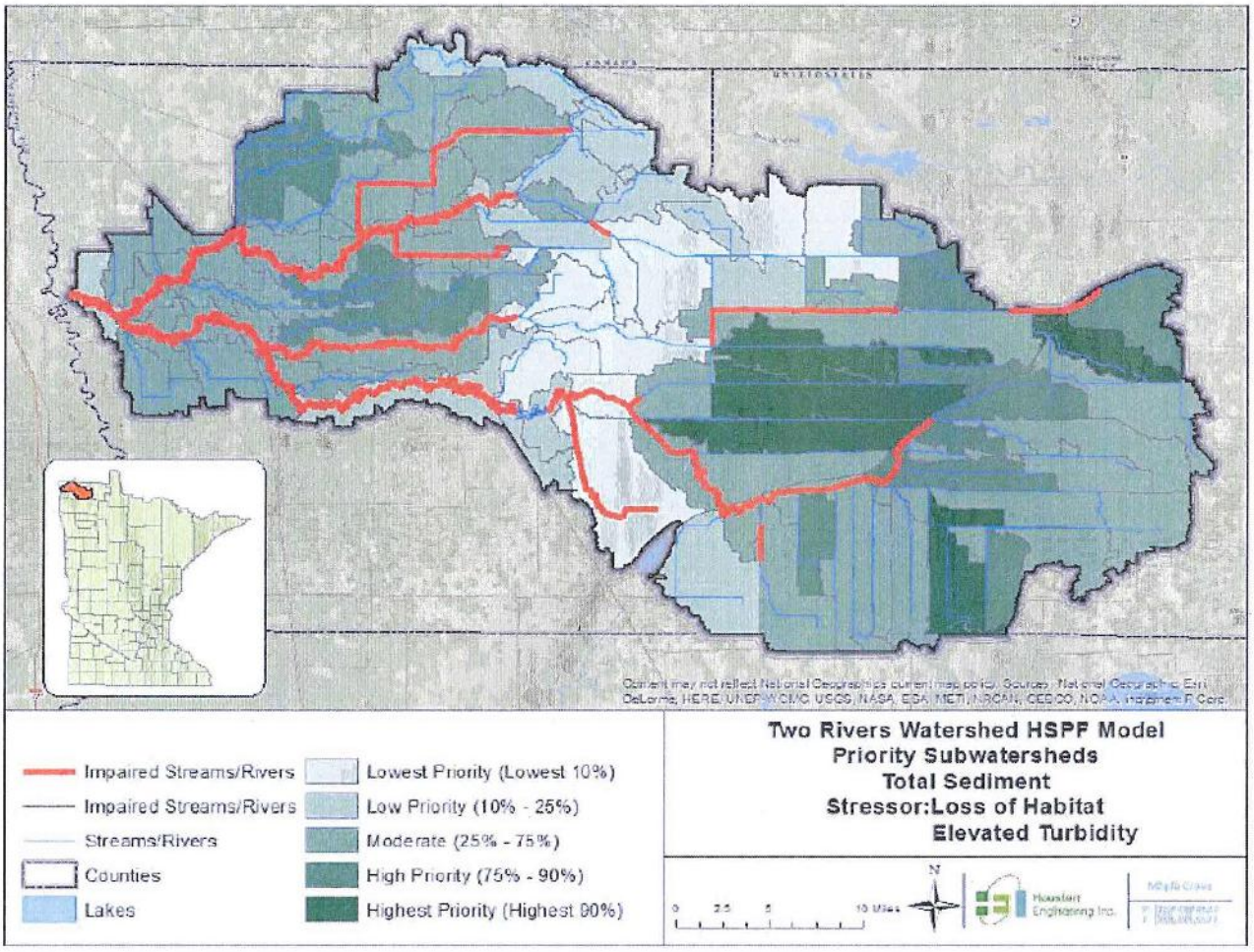

Figure 3-18: Subwatershed priority of TSS yields for subwatershed in the TRW based on HSPF model results.

Excerpted from the TMDL document

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

Section 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)(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.

Section 2 Review Comments:

Applicable water quality standards (WQS) are identified, described, and a numerical water quality target is included.

Table 2-1 of the TMDL document identifies the numerical water quality targets as the numerical water quality criteria from MN water quality standards. Additional information on the applicable water quality standards is included in the text of Section 2 of the TMDL document and excerpted below as appropriate.

Table 2-1: Surface water quality standards for TRW stream reaches addressed in this TMDL report.

Parameter	Water Quality Standard	Units	Criteria	Period of Time Standard Applies
Escherichia coli (*E. coli*)	Not to exceed 126	org/100 mL	Monthly geometric mean	April 1-October 31
	Not to exceed 1,260	org/100 mL	Upper 10th percentile	
Total suspended solids (TSS)-Southern Nutrient Region	Not to exceed 65	mg/L	Upper 10th percentile	April 1 – September 30

Excerpted from the TMDL document

All impaired waters addressed in this TMDL study are classified as Class 2Bd, 2B, or 2C waters (MPCA 2016b).

***Class 2Bd waters** - The quality of Class 2Bd 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 (Minn. R. 7050.0222, Subp. 3).*

***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. This class of surface water is not protected as a source of drinking water (Minn. R. 7050.0222, Subp. 4).*

***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 (Minn. R. 7050.0222, subp. 5).*

[Excerpted from the TMDL document]

E. coli

Minn. R. 7050.0222 water quality standards for E. coli states: Escherichia (E.) coli - Not to exceed 126 organisms per 100 milliliters as a geometric mean of not less than five samples representative of conditions within any calendar month, nor shall more than ten percent of all samples taken during any calendar month individually exceed 1,260 organisms per 100 milliliters. The standard applies only between April 1 and October 31. [Excerpted from the TMDL document]

Total Suspended Solids

Total Suspended Solids (TSS)

In January of 2015, the EPA issued an approval of the adopted amendments to the State Water Quality Standards, replacing the historically-used turbidity standard with TSS standards. The TSS TMDLs now replace the turbidity TMDLs. Therefore, this TMDL study will assume all previous turbidity impairments in the TRW will be treated as TSS impairments. TSS is a measurement of the weight of suspended mineral (e.g., soil particles) or organic (e.g., algae) sediment per volume of water (MPCA 2014). The recently approved Minnesota State TSS standards are based upon nutrient regions, which are loosely based on ecoregions. The TRW is located in the Southern Nutrient Region. The state TSS standard for this region is 65 milligrams per liter (mg/L) (MPCA 2013).

[Excerpted from the TMDL document]

https://www.revisor.mn.gov/rules/?id=7050.0222

The TMDL expresses the relationship between any necessary reduction of the pollutant of concern and the attainment of the numeric water quality target. If the target is not pollutant of concern, the linkage between the surrogate and POC is described.

> The target is the pollutant of concern (*E. coli* and TSS) and is expressed directly as the water quality criterion taken from applicable water quality standards. Load duration curves are utilized to directly determine the flow dependent loads of the pollutant of concern that are necessary to meet the water quality target. Necessary reductions based on current loading estimates are identified in the TMDL Summary Tables (see TMDL Review Table 1) for each of the waterbody impairment combinations.

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

Section 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 additionally 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.

Section 3 Review Comments:

The loading capacity is presented for the pollutant of concern (including daily loads).

Tables 4-5, 4-6, 4-7, 4-8, and 4-9 of the TMDL document present a summary of the TMDL analysis for the stream reaches impaired by *E. coli*. These tables present the assimilative capacity, loading allocations, and needed load reductions based on the central point of the five flow regimes from the associated Load Duration Curves developed for each impaired reach. The corresponding TMDL load duration curves from Appendix A of the TMDL document are included below each table.

> *For E. coli, the LC was calculated using both the instantaneous standard of 1260 organisms/100 mL and the geometric mean (i.e., geomean) standard of 126 organisms/100 mL. Given that all bacteria impairments in the TRW occur under the geometric standard, the load reductions computed under the geometric scenario were used to set the TMDLs.*
> *(Excerpted from the TMDL).*

The EPA notes that both parts of the *E. coli* WQS are applicable.

Table 4-5: *E. coli* TMDL summary for Two Rivers, Middle Branch Two Rivers to North Branch Two Rivers (AUID 09020312-501).

Escherichia coli		Flow Regime				
		Very High	High	Mid	Low	Very Low
		[Billions CFU/day]				
Loading Capacity		5,737	1,304	398	122	25
Wasteload Allocation	Total WLA	22.2	22.2	22.2	22.2	22.2
	Badger WWTF	1.8	1.8	1.8	1.8	1.8
	Greenbush WWTF	10.9	10.9	10.9	10.9	10.9
	Hallock WWTF	7.5	7.5	7.5	7.5	7.5
	Lake Bronson WWTF	2.1	2.1	2.1	2.1	2.1
Load Allocation	Total LA	5,141	1,151	336	88	0.3
Margin of Safety (MOS)		574	130	40	12	2.5
Existing Load		9,562	409	197	119	20.0
Unallocated Load		0	894	201	3	5
Estimated Load Reduction		40%	0%	0%	0%	0%

LC, WLA, LA, and MOS are part of the TMDL equation (**Equation 1**). The existing load is based on available water quality data; the unallocated load is the load, if any, that remains if the existing load is below the load capacity; and the estimated load reduction is the reduction, as a percentage, of the existing load to meet the numeric water quality standard.

Excerpted from the TMDL document

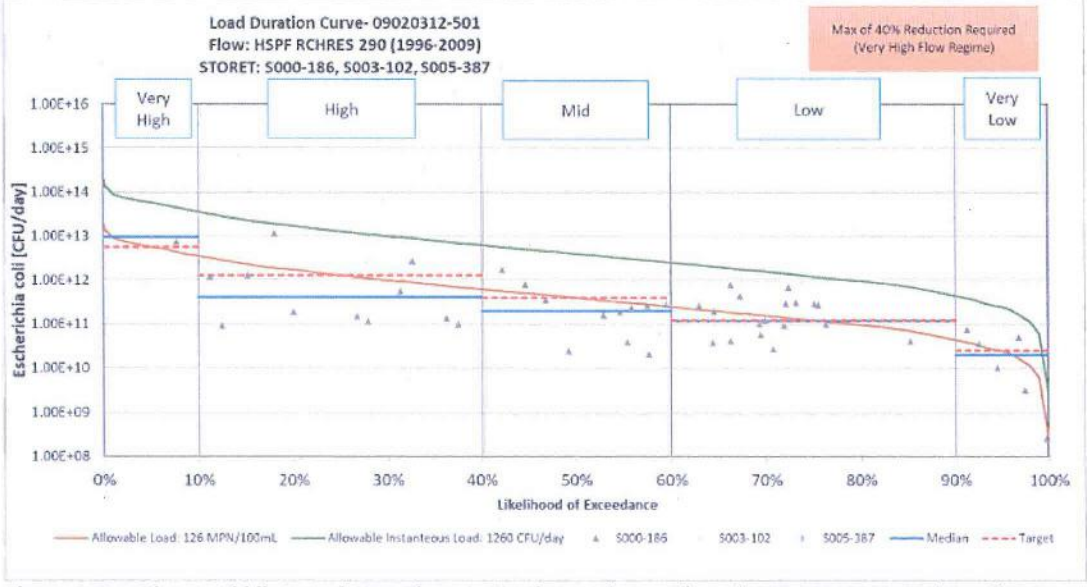

Figure 4. Two Rivers: Middle Branch Two Rivers to North Branch Two Rivers (AUID 09020312-501) *E. coli* LDC.

Excerpted from the TMDL document-Appendix A

Table 4-6: *E. coli* TMDL summary for Middle Branch Two Rivers, CD 23 to South Branch Two Rivers (AUID 09020312-503).

Escherichia coli		Flow Regime				
		Very High	High	Mid	Low	Very Low
		[Billions CFU/day]				
Loading Capacity		474.1	90.9	26.8	7.4	0.90
Wasteload Allocation	Total WLA	1.8	1.8	1.8	1.8	***
	Badger WWTF	1.8	1.8	1.8	1.8	***
Load Allocation	Total LA	424.9	80.0	22.4	4.9	0.81
Margin of Safety (MOS)		47.4	9.1	2.7	0.7	0.09
Existing Load		112.7	45.6	18.1	11.0	ND[1]
Unallocated Load		361.4	45.3	8.7	0.0	Unk
Estimated Load Reduction		0%	0%	0%	33%	Unk

LC, WLA, LA, and MOS are part of the TMDL equation (**Equation 1**). The existing load is based on available water quality data; the unallocated load is the load, if any, that remains if the existing load is below the load capacity; and the estimated load reduction is the reduction, as a percentage, of the existing load to meet the numeric water quality standard.

***The outflow from the WWTF will be greater than the median flow under this condition. Since outflow is a portion of streamflow, loading under this condition is unlikely to occur. If outflow from this WWTF occurs during this flow condition, the WLA will be the permitted outflow concentration multiplied by the flow rate

[1]ND = No data. No observed data during this flow regime is available at the time of this TMDL. Therefore, existing load, unallocated load, and estimated load reductions are unknown (Unk).

Excerpted from the TMDL document

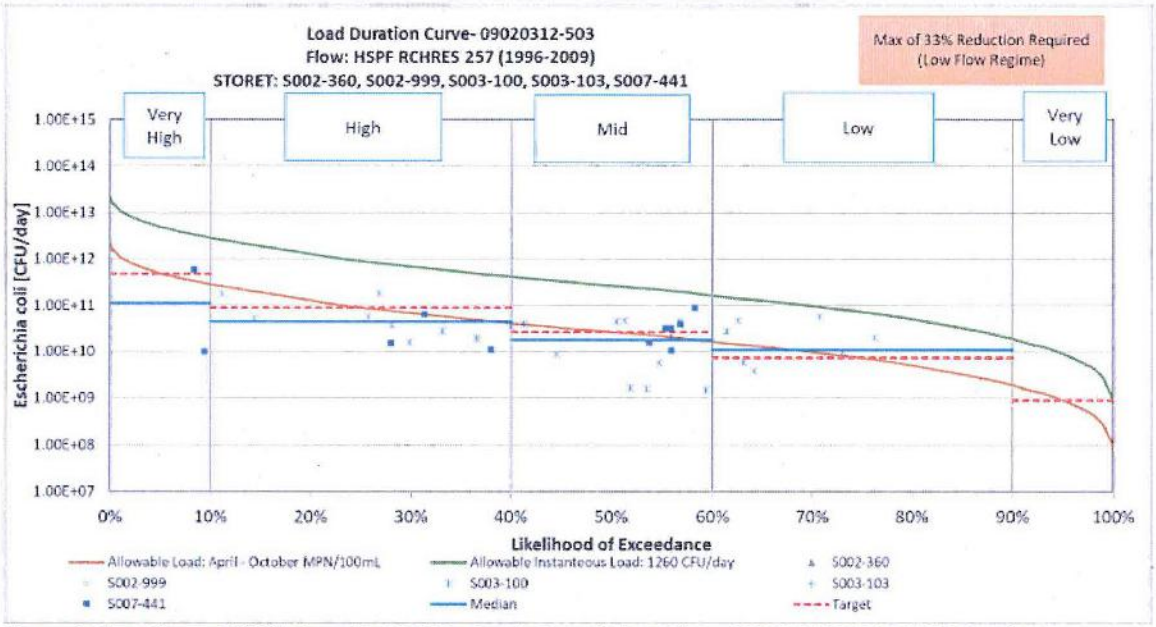

Figure 5. Two Rivers, Middle Branch: CD 23 to South Branch Two Rivers (AUID 09020312-503) *E. coli* LDC.

Excerpted from the TMDL document-Appendix A

Table 4-7: *E. coli* TMDL summary for South Branch Two Rivers, Lateral Ditch 2 to Lake Bronson (AUID 09020312-505).

Escherichia coli		Flow Regime				
		Very High	High	Mid	Low	Very Low
		[Billions CFU/day]				
Loading Capacity		4,595	1,000	303.8	99.3	19.7
Wasteload Allocation	Total WLA	10.9	10.9	10.9	10.9	10.9
	Greenbush WWTF	10.9	10.9	10.9	10.9	10.9
Load Allocation	Total LA	4,125	889	262.5	78.5	6.9
Margin of Safety (MOS)		459.5	100	30.4	9.9	2.0
Existing Load		88,242	631	190.9	24.2	ND[1]
Unallocated Load		0.0	369	112.9	75.1	Unk
Estimated Load Reduction		95%	0.0	0.0	0.0	Unk

LC, WLA, LA, and MOS are part of the TMDL equation (**Equation 1**). The existing load is based on available water quality data; the unallocated load is the load, if any, that remains if the existing load is below the load capacity; and the estimated load reduction is the reduction, as a percentage, of the existing load to meet the numeric water quality standard.

[1]ND = No data. No observed data during this flow regime is available at the time of this TMDL. Therefore, existing load, unallocated load, and estimated load reductions are unknown (Unk).

Excerpted from the TMDL document

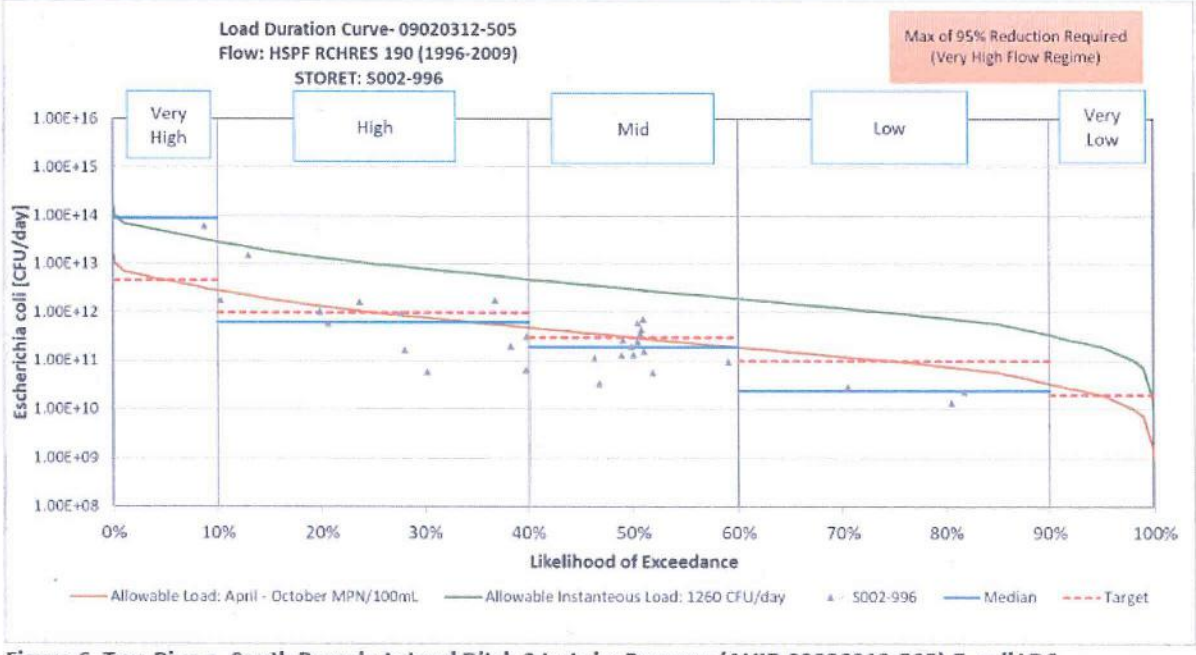

Figure 6. Two Rivers, South Branch: Lateral Ditch 2 to Lake Bronson (AUID 09020312-505) *E. coli* LDC.

Excerpted from the TMDL document-Appendix A

Table 4-8: *E. coli* TMDL summary for South Branch Two Rivers, Unnamed ditch to Lateral Ditch 2 SD 95 (AUID 09020312-506).

Escherichia coli		Flow Regime				
		Very High	High	Mid	Low	Very Low
		[Billions CFU/day]				
Loading Capacity		2,773.6	614.0	191.3	60.7	11.7
Wasteload Allocation	Total WLA	0.00	0.00	0.00	0.00	0.00
Load Allocation	Total LA	2,496	553	172	54.6	10.5
Margin of Safety (MOS)		277.4	61.4	19.1	6.1	1.2
Existing Load		ND[1]	567.7	63.8	209.5	ND[1]
Unallocated Load		Unk	46.3	127.5	0.0	Unk
Estimated Load Reduction		Unk	0%	0%	71%	Unk

LC, WLA, LA, and MOS are part of the TMDL equation (**Equation 1**). The existing load is based on available water quality data; the unallocated load is the load, if any, that remains if the existing load is below the load capacity; and the estimated load reduction is the reduction, as a percentage, of the existing load to meet the numeric water quality standard.

[1]ND = No data. No observed data during this flow regime is available at the time of this TMDL. Therefore, existing load, unallocated load, and estimated load reductions are unknown (Unk).

Excerpted from the TMDL document

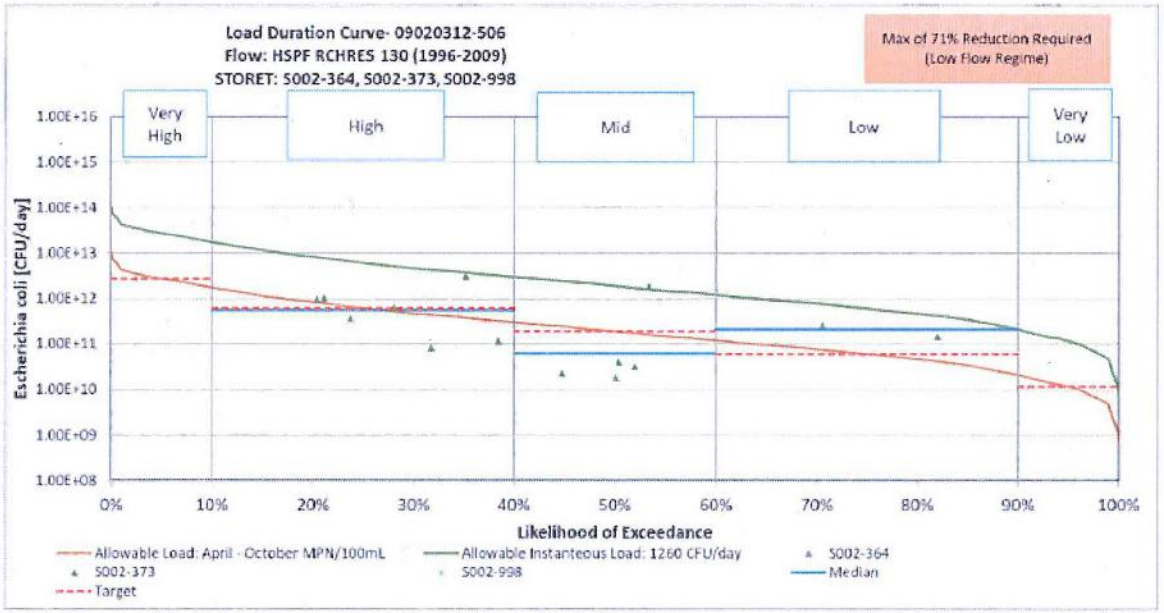

Figure 7. Two Rivers, South Branch: Unnamed Ditch to Lateral Ditch 2 SD 95 (AUID 09020312-506) *E. coli* LDC.

Excerpted from the TMDL document Appendix A

Table 4-9: *E. coli* TMDL summary for County Ditch 13, Unnamed ditch to Badger Creek (disconnected portion) (AUID 09020312-535).

Escherichia coli		Flow Regime				
		Very High	High	Mid	Low	Very Low
		[Billions CFU/day]				
Loading Capacity		201.7	41.3	11.38	3.21	0.58
Wasteload Allocation	Total WLA	1.8	1.8	1.8	1.8	***
	Badger WWTF	1.8	1.8	1.8	1.8	***
Load Allocation	Total LA	179.8	35.4	8.45	1.09	0.52
Margin of Safety (MOS)		20.2	4.1	1.1	0.32	0.06
Existing Load		ND[1]	10.3	10.4	12.4	ND[1]
Unallocated Load		Unk	31.0	1.0	0.0	Unk
Estimated Load Reduction		Unk	0%	0%	74%	Unk

LC, WLA, LA, and MOS are part of the TMDL equation (**Equation 1**). The existing load is based on available water quality data; the unallocated load is the load, if any, that remains if the existing load is below the load capacity; and the estimated load reduction is the reduction, as a percentage, of the existing load to meet the numeric water quality standard.

***The outflow from the WWTF will be greater than the median flow under this condition. Since outflow is a portion of streamflow, loading under this condition is unlikely to occur. If outflow from this WWTF occurs during this flow condition, the WLA will be the permitted outflow concentration multiplied by the flow rate

[1]ND = No data. No observed data during this flow regime is available at the time of this TMDL. Therefore, existing load, unallocated load, and estimated load reductions are unknown (Unk).

Excerpted from the TMDL document

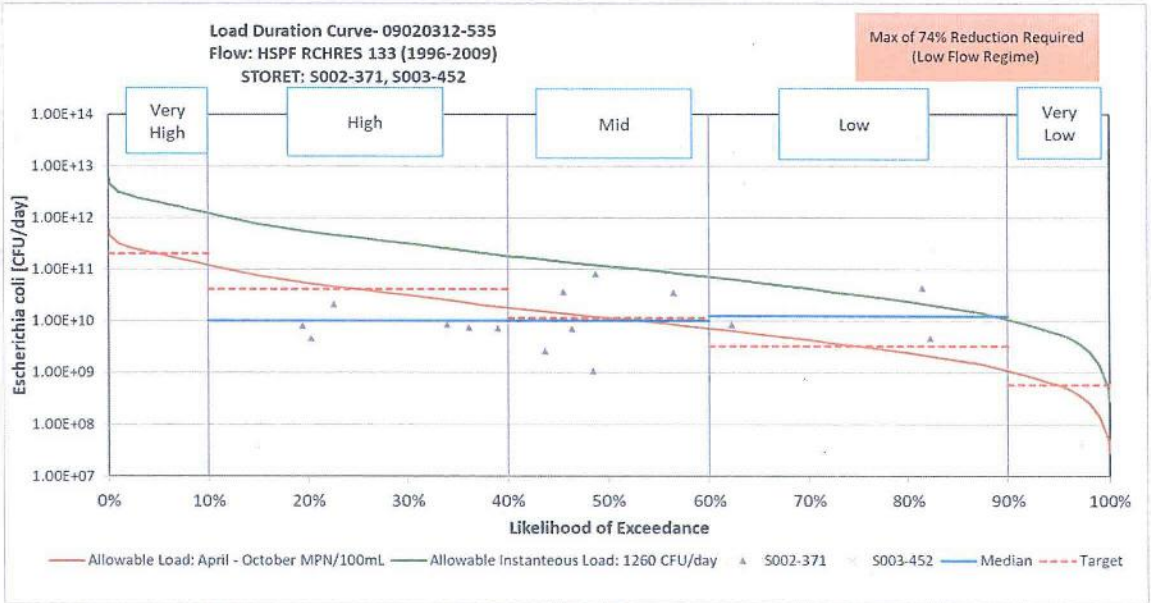

Figure 8. County Ditch 13: Unnamed Ditch to Badger Creek (disconnected portion) (AUID 09020312-535) *E. coli* LDC.

Excerpted from the TMDL document- Appendix A

Figures 9 and 10 of Appendix A of the TMDL document present the load duration curves for total suspended solids based on the WQS of 65 mg/l. Tables 4-14 and 4-15 of the TMDL document present the loading capacity for each of the 5 flow regimes identified in the load duration curves.

Table 4-14: Total suspended solids TMDL for Two Rivers, Middle Branch Two Rivers to North Branch Two Rivers (AUID 09020312-501).

Total Suspended Solids		Flow Regime				
		Very High	High	Mid	Low	Very Low
		[tons/day]				
Loading Capacity		**347.9**	**87.8**	**28.81**	**9.20**	**1.64**
Wasteload Allocation	**Total WLA**	**1.22**	**0.96**	**0.90**	**0.88**	**0.87**
	Badger WWTF	0.07	0.07	0.07	0.07	0.07
	Greenbush WWTF	0.43	0.43	0.43	0.43	0.43
	Hallock WWTF	0.29	0.29	0.29	0.29	0.29
	Lake Bronson WWTF	0.08	0.08	0.08	0.08	0.08
	Construction/Industrial Stormwater	0.35	0.09	0.03	0.009	0.002
Load Allocation	**Total LA**	**311.9**	**78.0**	**25.0**	**7.40**	**0.60**
Margin of Safety (MOS)		**34.8**	**8.8**	**2.9**	**0.92**	**0.16**
Existing Load		**820.9**	**131.5**	**28.4**	**6.13**	**0.89**
Unallocated Load		**0.0**	**0.0**	**0.4**	**3.07**	**0.75**
Estimated Load Reduction		**58%**	**33%**	**0%**	**0%**	**0%**

LC, WLA, LA, and MOS are part of the TMDL equation (Equation 1). The existing load is based on available water quality data; the unallocated load is the load, if any, that remains if the existing load is below the load capacity; and the estimated load reduction is the reduction, as a percentage, of the existing load to meet the numeric water quality standard.

Excerpted from the TMDL document

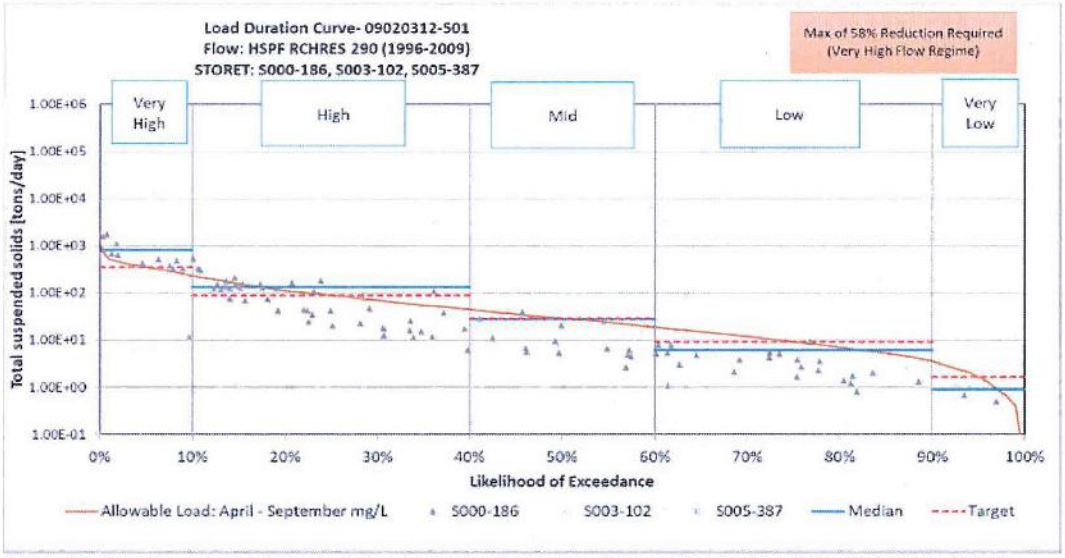

Figure 10. Two Rivers: Middle Branch Two Rivers to North Branch Two Rivers (AUID 09020312-501) TSS LDC.

Excerpted from the TMDL document – Appendix A

Table 4-15: Total suspended solids TMDL for Two Rivers, North Branch Two Rivers to Red River (AUID 09020312-509).

Total Suspended Solids		Flow Regime				
		Very High	High	Mid	Low	Very Low
		[tons/day]				
Loading Capacity		520.7	130.3	45.0	14.4	2.79
Wasteload Allocation	Total WLA	1.47	1.08	0.99	0.96	0.95
	Badger WWTF	0.07	0.07	0.07	0.07	0.07
	Greenbush WWTF	0.43	0.43	0.43	0.43	0.43
	Hallock WWTF	0.29	0.29	0.29	0.29	0.29
	Lake Bronson WWTF	0.08	0.08	0.08	0.08	0.08
	Lancaster WWTF	0.08	0.08	0.08	0.08	0.08
	Construction/Industrial Stormwater	0.52	0.13	0.04	0.014	0.003
Load Allocation	Total LA	467.2	116.2	39.5	12.0	1.56
Margin of Safety (MOS)		52.1	13.0	4.5	1.44	0.28
Existing Load		1,509.3	579.5	154.0	26.6	2.2
Unallocated Load		0.0	0.0	0.0	0.0	0.59
Estimated Load Reduction		65%	78%	71%	46%	0%

LC, WLA, LA, and MOS are part of the TMDL equation (**Equation 1**). The existing load is based on available water quality data; the unallocated load is the load, if any, that remains if the existing load is below the load capacity; and the estimated load reduction is the reduction, as a percentage, of the existing load to meet the numeric water quality standard.

Excerpted from the TMDL document

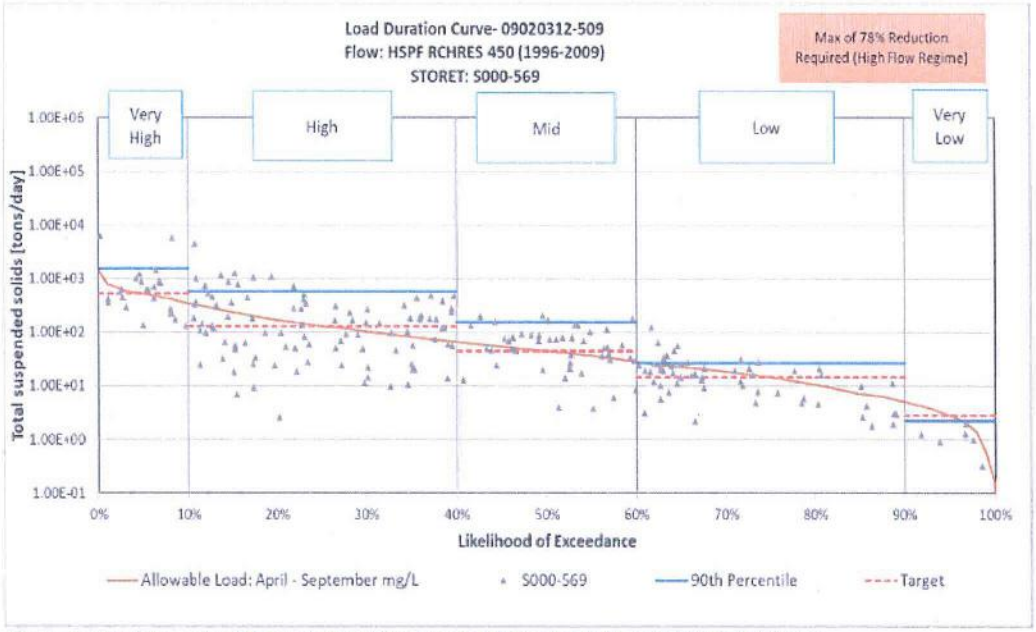

Figure 9. Two Rivers, North Branch Two Rivers to Red River (AUID 09020312-509) TSS LDC.

Excerpted from the TMDL document – Appendix A

The method to establish the cause and effect relationship between the pollutant of concern and the numerical target is described and the TMDL Analysis is documented and supported.

The load duration curve method creates a precise relationship between the numerical target and the pollutant of concern by directly setting the numerical target based on the product of the water quality criterion from approved water quality standards and the instantaneous discharge. A description of the methodology for creating and interpreting load duration curves is included in Sections 4.1.1, 4.2.1, and Appendix A of the TMDL document.

> *LDCs were developed for each AUID listed in Table 1. Each LDC was developed by combining the (simulated or observed) river/stream daily flow at the downstream end of the AUID with the measured concentrations available within the segment. Methods detailed in the U.S. Environmental Protection Agency (EPA) document An Approach for Using Load Duration Curves in the Development of TMDLs were used in creating the curves (EPA 2007). A summary of this methodology, as applied in the TRW, is provided below. Full details on LDC methods can be found in the EPA guidance (EPA 2007).*
> *[Excerpted from the TMDL document]*

Critical Conditions are described and accounted for.

The load duration curve approach directly addresses critical conditions by establishing the loading capacity for each discharge value for the entire hydrograph. Since all flow conditions are covered, and the loading capacity is depended on flow, critical conditions will be accounted for.

E. coli

Additional discussion on addressing seasonal variation and critical conditions for *E. coli* is presented in section 4.1.5 of the TMDL document.

> *A summary of the bacteria load reduction results and critical flow regimes are found in Table 4-4. Results are summarized by indicating the maximum required percent load reduction for each curve, and the flow regime and water quality criteria under which this maximum reduction occurred (i.e., the critical flow regime and criteria). The critical flow regime for bacteria loading ranges from low flows to very high flows*
> *[Excerpted from the TMDL document]*

Table 4-4: Maximum required bacterial load reductions for the TRW.

AUID (09020312-XXX)	Bacteria		
	Max. % Load Reduction	Critical Flow Regime	Critical Criterion
501	40%	Very High	Geometric Mean
503[1]	33%	Low	Geometric Mean
505[1]	95%	Very High	Geometric Mean
506[1]	71%	Low	Geometric Mean
535[1]	74%	Low	Geometric Mean

[1] Observed data not available for all flow regimes (see paragraph below).

Excerpted from the TMDL document

TSS

Section 4.2.5 of the TMDL document provides additional details on how critical conditions and seasonal variation are address for TSS.

> *A summary of the TSS load reduction results can be found in Table 4-13. Results are summarized by indicating the maximum required percent load reduction for each curve and the flow regime and water quality criteria under which this maximum reduction occurred (i.e., the critical flow regime and criteria). The critical flow regimes for TSS loading were very high flow for AUID 09020312-501 and high flow for AUID 09020312-509.*
> *[Excerpted from the TMDL document]*

Table 4-13: Maximum required total suspended load reductions for the TRW.

AUID (09020312-XXX)	Total Suspended Solids	
	Max. % Load Reduction	Critical Flow Regime
Two Rivers, Middle Branch Two Rivers to North Branch Two Rivers (-501)	58%	Very High
Two Rivers, North Branch Two Rivers to Red River (-509)	78%	High

Excerpted from the TMDL document

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

Section 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.

Section 4 Review Comments

Load allocations for existing (and future if applicable) NPS are accounted for.

E. coli.

Load allocations for *E. coli* are presented in Tables 4-5 through 4-9 of the TMDL document. Section 4.1.2 of the TMDL document provides a brief discussion on the *E. coli* load allocation methodology. Natural background allocations are not separated out but rather included in the overall load allocation.

> *LAs represent the portion of the LC designated for nonpoint sources of E. coli. The LA is the remaining load once the WLA, RC, and MOS are determined and subtracted from the LC. LAs are associated with loads that are not regulated by NPDES permits, including nonpoint sources of pollutants and "natural background" contributions. "Natural background" can be described as physical, chemical, or biological conditions that would exist in a waterbody and that are not a result of human activity.*
> *[Excerpted from the TMDL document]*

Reserve capacity –*E. coli* LA

Future growth considerations are discussed in section 4.1.6 of the TMDL document

> *No additional RC was included for the point sources in the TRW, given the nature of the assumptions used to create the WLAs. Similarly, no RC was included for nonpoint sources in the watershed (LAs), given that the land use in the TRW is dominated by agriculture and is unlikely to substantially change in the future.*
> *[Excerpted from the TMDL document]*

Total Suspended Solids (TSS) Load Allocations

Load allocations for TSS are presented in Tables 4-14 and 4-15. The methodology for determining the load allocations is discussed in section 4.2.2 of the TMDL document.

> *The LA is considered the remaining LC once WLAs, reserve capacities, and MOSs are determined. LAs are associated with loads that are not regulated by NPDES permits, including nonpoint sources of pollutants and "natural background" contributions. "Natural background" can be described as physical, chemical, or biological conditions that would exist in a waterbody that are not a result of human activity. Nonpoint sources of pollution in the TRW were discussed previously and include overland erosion, channel degradation, natural background, and other sources.*
> *[Excerpted from the TMDL document]*

Reserve capacity – TSS

Section 4.2.6 of the TMLD discusses reserved TSS allocations for future growth.

> *No additional RC was included for the point sources in the TRW, given the nature of assumptions used to create the WLAs. Similarly, no RC was included for nonpoint sources in the watershed (LAs), given that the land use in the TRW is dominated by agriculture and is unlikely to substantially change in the future.*
> *[Excerpted from the TMDL document]*

Natural Background Loads. – TSS

Natural background loads are not separated out in either the source assessment nor is a separate load allocated. The following explanation is provided in the TMDL document.

> *For each impairment, natural background levels are implicitly incorporated in the water quality standards used by the MPCA to determine/assess impairment, and therefore natural background is included in MPCA's waterbody assessment process. Not enough data were available to evaluate natural background conditions explicitly. The position of the MPCA is that the source assessment exercises indicate natural background inputs are generally low compared to livestock, cropland, artificial drainage, WWTFs, failing SSTSs, and other anthropogenic sources. For all impairments addressed in this TMDL report, natural background sources are implicitly included in the LA portion of the TMDL allocation tables, and TMDL reductions should focus on the major anthropogenic sources identified in the source assessment.*
> *[Excerpted from the TMDL document]*

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

Section 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 permitees 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.

Section 5 Review Comments

WLAs are properly assigned

Sections 4.1.3 and 4.2.3 of the TMDL document discuss the methodology used to assign Waste Load Allocations (WLAs) for *E. coli* and Total Suspended Sediment respectively.

E. coli

NPDES Permitted Waste Water Treatment Plants and Industrial Point Sources – *E. coli*

WLA for *E. coli* are provided in Tables 4-5, 4-6, 4-7, 4-8, and 4-9 of the TMDL document and Table 4-3 below.

> *The maximum daily permitted bacteria WLAs were converted to maximum annual loads by estimating the number of days to discharge the secondary pond at maximum discharge and multiplying that value by the allowable daily loads. Maximum permitted daily and annual bacteria WLAs for the TRW WWTFs are shown in Table 4-3. The WLAs for straight pipe septic systems remain at zero. [Excerpted from the TMDL document]*

Table 4-3: Annual and daily *E. coli* wasteload allocations for WWTFs in the TRW.

	A	B	C	D	E	F	G
Facility	Permitted Max Daily Discharge (liters/day)[1]	# of Days Discharging per Year at Maximum Discharge, Twice a year	Permitted Fecal Coliform Conc. (org/100 mL)	WLA-Fecal Coliform (10^9org/day) (A*C/10^6/100)	*E. coli* Colonies per Fecal Coliform Colony[2]	Daily WLA-*E. coli* (10^9org/day) (D*E)	Annual WLA-*E. coli* (10^9/yr) (B*F)
Badger	1,418,504	16	200	2.84	0.63	1.8	28.6
Greenbush	8,634,373	12	200	17.27	0.63	10.9	130.6
Hallock	5,920,713	16	200	11.84	0.63	7.5	119.4
Lake Bronson	1,665,201	16	200	3.33	0.63	2.1	33.6

[1] Computed based on the average surface area of the secondary treatment pond size and an assumed maximum daily discharge of six inches per day.

[2] Based on the MPCA recommended *E. coli* to fecal coliform ratio of 126:200

Excerpted from the TMDL document

MS4s– *E. coli*

No Permitted Municipal Separate Storm Sewer systems are present in the contributing watersheds and therefore no waste load allocation is provided.

CAFOs – E. coli

One CAFO was identified in the TRW. High Prairie Dairy holds NPDES Permit MNG440499. It is located in the North Branch Two Rivers Subwatershed (0902031206), which is within the drainage basin of one of the AUIDs that has an impairment addressed

in this report (09020312-509). However, this is a zero discharge facility and therefore is not given a WLA in the TMDL (WLA = 0).

Construction and Industrial Stormwater Sources. – *E. coli*

Waste load allocations for *E. coli* are not provided for construction or industrial stormwater sources as they are not required under State permitting rules.

> *WLAs for regulated construction stormwater (Permit #MNR100001) were not developed, since E. coli is not a typical pollutant from construction sites. WLAs for regulated industrial stormwater were also not developed. Industrial stormwater must receive a WLA only if the pollutant is part of benchmark monitoring for an industrial site in the watershed of an impaired waterbody. There are no bacteria or E. coli benchmarks associated with any of the industrial stormwater permit (Permit #MNR050000).*
> *[Excerpted from the TMDL document]*

Future Growth– *E. coli*

Additional reserve capacity for future growth is not provided for either the waster load allocation or the non-point source loading allocations.

> *No additional RC was included for the point sources in the TRW, given the nature of the assumptions used to create the WLAs. Similarly, no RC was included for nonpoint sources in the watershed (LAs), given that the land use in the TRW is dominated by agriculture and is unlikely to substantially change in the future.*
> *[Excerpted from the TMDL document]*

TSS – WLAs

Section 4.2.3 of the TMDL document discusses the methodology used to assign TSS WLAs.

> *The WLA represents the regulated portion of the loading capacity, requiring a NPDES permit. Regulated sources may include construction stormwater, industrial stormwater, Municipal Separate Storm Sewer Systems (MS4) permitted areas, NPDES permitted feedlots, and WWTFs. The only regulated sources of TSS are construction and industrial stormwater discharges and WWTFs. There are no MS4s or NPDES permitted feedlots in the drainage basins of any impaired streams.*
> *[Excerpted from the TMDL document]*

NPDES Permitted Waste Water Treatment Plants – TSS

Table 4-12 of the TMDL document provides a summary of the TSS WLA for the NPDES permitted WWTP facilities in the basin, including permit numbers. WLAs are also provided in Tables 4-14 and 4-15 for each of the five flow regimes of the load duration curves.

> *All TRW WWTFs are limited to discharging from a single surface secondary treatment cell. All WWTFs are permitted to discharge only during specified discharge windows in the spring and fall. The discharge windows are March 1 through June 30 and September 1 through December 31 with no discharge to ice covered waters.*
> *Per MPCA guidance, the permitted WLAs were calculated for each WWTF based on the Calendar Month Average TSS and the maximum discharge of six inches per day. WLAs were computed for TSS based on the maximum permitted daily flow rate from each facility.*
> *The maximum daily permitted TSS WLAs were converted to maximum annual loads by estimating the number of days to discharge the secondary pond at maximum discharge and multiplying that value by the allowable daily loads. Maximum permitted daily and annual TSS WLAs for the TRW WWTFs are shown in Table 4-12.*
> *[Excerpted from the TMDL document]*

Table 4-12: Annual and daily TSS wasteload allocations for TRW WWTFs.

			A				B		
Facility	NPDES Permit Number	System Type	Secondary Pond Size (acres)	Operating Depth (ft)	Average Wet Weather Design Flow (gpd)	Permitted Max Daily Discharge (gpd)[1] (A*0.163*10^6)	Calendar Month Average Load (kg/day)	Daily WLA-TSS (tons/ day) [B/907.2 (kg/ton)]	Annual WLA-TSS (tons/yr)[2]
Badger	MNG580155	Class D: 3-cell pond	2.3	4	55,000	374,729	63.8	0.7	1.12
Greenbush	MNG580156	Class D: 2-cell pond	14	3	114,000	2,280,960	388.5	0.43	5.13
Hallock	MNG580147	Class D: 3-cell pond	9.6	4	200,000	1,564,087	266.4	0.29	4.69
Lake Bronson	MNG580029	Class D: 2-cell pond	2.7	4	35,000	439,899	74.9	0.08	1.32
Lancaster	MNG580066	Class D: 2-cell pond	2.5	3.5	55,000	407,314	69.3	0.08	1.07

[1] Computed based on the average surface area of the secondary treatment pond size and an assumed maximum daily discharge of six inches per day.

[2]Assumes twice annual maximum discharges to completely drain secondary pond (i.e. 2* 6 inches per day * operating depth*daily WLA).

Excerpted from the TMDL document

Construction and Industrial Stormwater Sources. – TSS

Waste Load Allocations were provided for TSS for both construction and industrial stormwater sources. Construction and industrial Waste Load allocations were assigned proportional to drainage area of each basin assuming that 0.1% of the land is under construction at any given time.

> *Due to the transient nature of construction and industrial activities, it is assumed that 0.1% of the drainage area is under construction and industrial activities at any given time. Therefore, to calculate the WLA for construction and industrial stormwater, this TMDL report assumes that 0.1% of the load capacity for the stream reach is assigned to construction/industrial stormwater WLA. [Excerpted from the TMDL document]*

NPDES general permit numbers for construction and industrial stormwater WLA are provided in the text.

> *WLAs for construction and industrial stormwater discharges were combined and addressed through a categorical allocation. This TMDL report assumes that 0.1% of the TRW's land use contributes construction and/or industrial stormwater runoff at any given time. Historical permits and land use in the watershed support this assumption. Stormwater runoff from construction sites that disturb: (a) one acre of soil or more, (b) less than one acre of soil and are part of a "larger common plan of development or sale" that is greater than one acre, or (c) less than one acre, but determined to pose a risk to water quality are regulated under the state's NPDES/State Disposal System (SDS) General Stormwater Permits for Construction Activity (MNR1000001)....*
> *Similar to construction activities, industrial sites are regulated under general permits, in this case either the NPDES/SDS Industrial Stormwater Multi-Sector General Permit (MNR050000) or the NPDES/SDS General Permit for Construction Sand & Gravel, Rock Quarrying, and Hot Mix Asphalt Production facilities (MNG490000).*
> *[Excerpted from the TMDL document]*

Future Growth/Reserve Capacity – TSS

Section 4.2.6 of the TMDL document discusses considerations for future growth. No WLA was reserved for future growth.

> *No additional RC was included for the point sources in the TRW, given the nature of assumptions used to create the WLAs. Similarly, no RC was included for nonpoint sources in the watershed (LAs), given that the land use in the TRW is dominated by agriculture and is unlikely to substantially change in the future.*
> *[Excerpted from the TMDL document]*

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

Section 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.

Section 6 Review Comments:

Whether the MOS is expressed explicitly and/or implicitly, a justification must be provided that explains why the MOS chosen is believed to be adequate to account for any uncertainties and errors in the data and calculation of the TMDL.

An MOS is provided and justified. If an implicit MOS is used, conservative assumptions are identified, and their relative impacts discussed.

The TMDL document allocates 10% of the loading capacity to the MOS to account for uncertainties in the analysis of both the *E. coli* and TSS TMDLs. Load duration curves are inherently accurate as they express the loading capacity directly in terms of flow and numerical water quality standards. Additional potential error is associated with the HSPF flow modeling which the State believes is consistent with a 10% MOS based on similar modeling work done in the State and Region.

> *The purpose of the MOS is to account for uncertainty with attaining water quality standards. Uncertainty can be associated with data collection, lab analysis, data analysis, modeling error, and implementation activities. An explicit 10% of the loading capacity MOS was applied to each flow regime for all LDCs developed for this TMDL. The explicit 10% MOS accounts for:*
> - *Uncertainty in the observed daily flow record;*
> - *Uncertainty in the observed water quality data;*
> - *Uncertainty with regrowth in the sediment, die-off, and natural background levels of E. coli; and*
> - *Allocations and loading capacities are based on flow, which varies from high to low.*
>
> *This variability is accounted for using the five flow regimes and the LDCs*
>
> *The majority of the MOS is apportioned to uncertainty related to the HSPF model than with the other causes for uncertainty. There is no reason to believe that this number is inappropriate as it is consistent with HSPF modeling errors and is similar to the MOS in TMDLs within the region and across the state.*
> *[Excerpted from the TMDL document]*

The EPA finds that the TMDL document submitted by MPCA contains an appropriate MOS satisfying the requirements of the sixth criterion.

Section 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)).

Section 7 Review Comments:

Seasonal variation in loads and/or effects are described and accounted for.

> Load duration curves are used in the TMDL approach when WQS are expressed in terms of numerical concentration criteria. The concentration of a pollutant is a function of both the loading of the pollutant to the waterbody as well as the volume of water in the stream available to assimilate the load. The load duration curve approach accounts for variation by directly determining the assimilative capacity of a waterbody based on the flow in the waterbody at any given time.

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

Section 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.

Section 8 Review Comments:

Reasonable Assurance that NPS Load Reductions will occur is provided in the document.

Clean Water Legacy Act: 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.

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 Watershed Restoration and Protection Strategies (WRAPS). The WRAPS are required to contain such elements as the identification of impaired waters, watershed modeling outputs, point and nonpoint sources, load reductions, etc. (Chapter 114D.26; CWLA). The WRAPS also contain an implementation table of strategies and actions that are capable of achieving the needed load reductions, for both point and nonpoint sources (Chapter 114D.26, Subd. 1(8); CWLA). Implementation plans developed for the TMDLs are included in the table, and are considered "priority areas" under the WRAPS process (Watershed Restoration and Protection Strategy Report Template, MPCA). This table includes not only needed actions but a timeline for achieving water quality targets, the reductions needed from both point and nonpoint sources, the governmental units responsible, and interim milestones for achieving the actions. MPCA has developed

guidance on what is required in the WRAPS (Watershed Restoration and Protection Strategy Report Template, MPCA). The WRAPS for the Two Rivers watershed was approved by MPCA on June 10, 2019

The parties responsible for implementation are identified:
Which parties will be responsible for coordinating and implementing measures to achieve NPS reductions?

The Two Rivers Watershed District will continue to work cooperatively on identifying and implementing best management practices within the watershed to reduce non-point source pollution including *E. coli* and Sediment.

The TRWD, along with Kittson, Marshall, and Roseau SWCDs have a long history of improving water quality. They have been actively seeking grants to improve agricultural drainage and improve local water quality since the passage of the Clean Water, Land, and Legacy Amendment and before. [Excerpted from the TMDL document]

Potential measures to achieve load reductions are identified?
How will the load reductions be implemented? Are the measures needed to reduce the NPS loads understood and available?

A discussion of the measures and BMPs needed to achieve the necessary load reductions in NPS sources is discussed in Section 8.2.1 of the TMDL document, a summary of which is included in the text of the document.

The TRWD have set goals in their WMP (TRWD 2004) to improve and sustain surface water quality and reducing erosion and sedimentation. This includes reducing erosion and sedimentation to waterways and wetlands, restoring a more natural hydrograph to waters in the watershed and reducing the "flashiness" of the hydrograph, restoring and rehabilitating unstable stream channels, continuing to monitor water quality, and completing this TMDL study. TRWD's strategies to achieve their goals include utilizing BMPs to install buffer strips along ditch systems adjacent to ag fields (in line with Minnesota's 2016 Buffer Law), identify susceptible areas via monitoring and this TMDL study, utilizing grass waterways, restore and create new wetlands, reduce field drainage and increase temporary storage in fields designed to hold water for short periods, installation of shelter belts to reduce wind erosion, install streambank bio-engineering protections and riparian restorations to create sinuosity and pools and riffles along water courses, and promote fencing of cattle and other livestock along water course when practical and feasible. In addition,

the TRWD plans to adopt strategies laid out in this TMDL study and the WRAPS document with coordination of local communities and utilizing local and state agencies, such as the NRCS, DNR, and MPCA.
[Excerpted from the TMDL document]

Numerous examples of similar practices already installed in the watershed are also provided in the document.

Potential resources needed for implementation are identified:
What resources and funding mechanisms are available for implementing the measures needed to achieve the load reductions?

The Two Rivers Watershed District will continue to pursue financing from a variety of sources. Funds will be used to implement best management practices in consultation with other local stakeholders through an adaptive management process. A process for adapting mitigation strategies based on information gained as the process for moving forward is identified.

The TRWD is committed to taking a lead role during the implementation of this TMDL study and has the ability to generate revenue and receive grants to finance the implementation items. In addition to commitment from local agencies, the State of Minnesota has also made a commitment to protect and restore the quality of its waters. In 2008, Minnesota voters approved the Clean Water, Land, and Legacy Amendment to increase the state sales tax, in part, to fund water quality improvements. The interagency Minnesota Water Quality Framework (Figure 6-1) illustrates the cycle of assessment, watershed planning, and implementation to which the state is committed. Funding to support implementation activities under this framework is made available through Minnesota's Board of Water and Soil Resources (BWSR), an agency that the TRWD has received grants from in the past. The TRWD has the ability to provide funding for projects consistent with those identified within the WMP. The WMP is required to be updated following a ten-year cycle and future revisions will include projects and methods to make progress toward implementing the TMDLs.
[Excerpted from the TMDL document]

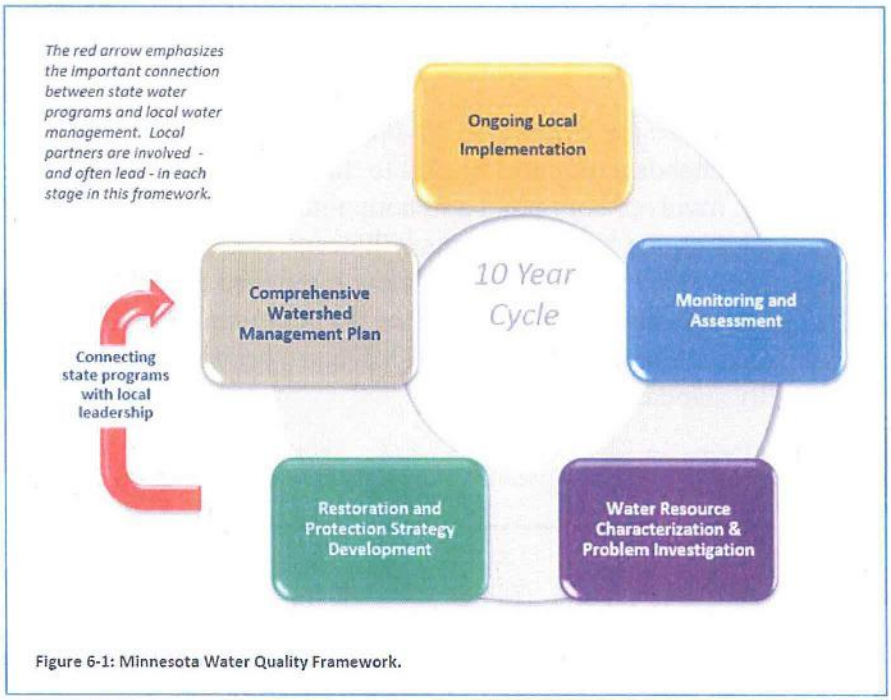

Figure 6-1: Minnesota Water Quality Framework.

Excerpted from the TMDL document

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

Section 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.

Section 9 Review Comments

Effectives Monitoring Plan is provided. (Recommended for all waterbodies, required for waterbodies with both PS and NPS load allocations to ensure load reductions occur.)

Section 7 of the TMDL document discusses post TMDL follow up monitoring and provides a brief summary of a monitoring strategy referenced in the Two Rivers WRAPS Data Review and Sampling Plan.

> *Three monitoring components are outlined within the Two Rivers Watershed's WRAPS Data Review and Sampling Plan (HEI 2014b), including water chemistry (quality) sampling, biological sampling, and flow monitoring. Ongoing water quality sampling occurs at 25 river/stream sites within the TRW that are sampled primarily between June 1 and September 30, with the majority of data available for DO, E. coli, eutrophication, pH, turbidity, and TSS. Minimum sample sizes for these parameters are determined by the data requirements for select water quality parameters in Minnesota's rivers and streams (MPCA 2014). Twelve citizen groups and LGU sponsored programs performed water chemistry sampling during the past 10-year assessment period and are anticipated to have continued involvement in water chemistry sample collection into the future.*
> *Future biological assessment sampling within the TRW includes resampling of seven locations for fish and four locations for macroinvertebrates (Dingmann 2014). Five long-term flow monitoring stations will continue to operate as permanent long-term stations, which will be visited every 30 to 40 days with additional visits during high flows (HEI 2014b). Section 7 of the Overall Plan of the TRWD (TRWD 2004), outlines additional details of historical and ongoing TRWD water quality and flow monitoring program actions.*

[Excerpted from the TMDL document]

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

Section 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.

Section 10 Review Comments

While EPA does not approve TMDL implementation plans, they can and often do provide valuable support to a demonstration of reasonable assurance that loading allocations will be met through implementation activities. The history of mitigation activities in the watershed, the existence of organizations tasked with planning and implementing future mitigation activities, and the thorough understanding of the location and magnitude of the sources of the pollutants of concern in the Two Rivers Watershed all contribute to a reasonable level of assurance that mitigation activities will be properly planned and implemented.

Implementation of Waste Load Allocations

Implementation of wasteload allocations for NPDES discharges, construction site stormwater, and industrial stormwater will be achieved through the respective MN state permitting programs.

Subsurface Sewage Treatment Systems (Septic Systems) reductions

Section 6.1.5 of the TMDL document discusses the State regulations for septic systems.

SSTS, commonly known as septic systems, are regulated by Minn. Stat. §§ 115.55 and 115.56. Counties and other local government units (LGUs) that regulate SSTS must meet the requirements for local SSTS programs in Minn. R. Ch. 7082. Counties and other LGUs must adopt and implement SSTS ordinances in compliance with Minn. R. Chs. 7080 through 7083. These regulations detail:

- *Minimum technical standards for individual and mid-size SSTS;*
- *A framework for LGU to administer SSTS programs; and*
- *Statewide licensing and certification of SSTS professionals, SSTS product review and registration, and establishment of the SSTS Advisory Committee.*

Counties and other LGUs enforce Minn. R. Chs. 7080 through 7083 through their local SSTS ordinance and issue permits for systems designed with flows up to 10,000 gallons per day.
[Excerpted from the TMDL document]

Additional text describes how straight pipe septic systems will be discontinued.

The MPCA staff keep a statewide database of known imminent threat to public health or safety (ITPHS) systems that include "straight pipe systems". These straight pipe systems are reported to the counties or the MPCA by the public. Upon confirmation of a straight pipe system, the county sends out a notification of non-compliance, which starts a 10-month deadline to fix the system and bring it into compliance. From 2006 through 2017, 742 straight pipes have been tracked by the MPCA. Seven hundred and one of those were abandoned, fixed, or were found not to be a straight pipe system as defined in Minn. Stat. 115.55, subd. 1. There have been 17 Administrative Penalty Orders issued and docketed in court. The remaining straight pipe systems received a notification of non-compliance. Those that do not update within the timeframe are addressed through the process outlined in Minn. Stat. § 115.55, subd. 11, that states if the owner does not replace or discontinue the use of the straight-pipe system within 10 months after the notice was received, the owner of the straight-pipe system shall be subject to an administrative penalty of $500 per month of noncompliance beyond the 10-month period. [Excerpted from the TMDL document]

EPA understands that although septic systems and straight pipe systems are currently a potential source of pollutants to the system, it is not the intent of this TMDL document to include a pollutant load allocation of any kind to these sources as the goal is to eliminate any discharge of pollutants from these sources to the affected waterbodies.

Non-Point source pollution.

Section 8.2 of the TMDL document discusses the implementation of measures to reduce NPS pollution. Extensive analysis was conducted to identify the potential sources of TSS within the watershed.

Figure 3-14 of the TMDL document provides detailed information about the primary sources of *E. coli* that can be used to guide the selection and siting of best management practices to control *E. coli* inputs.

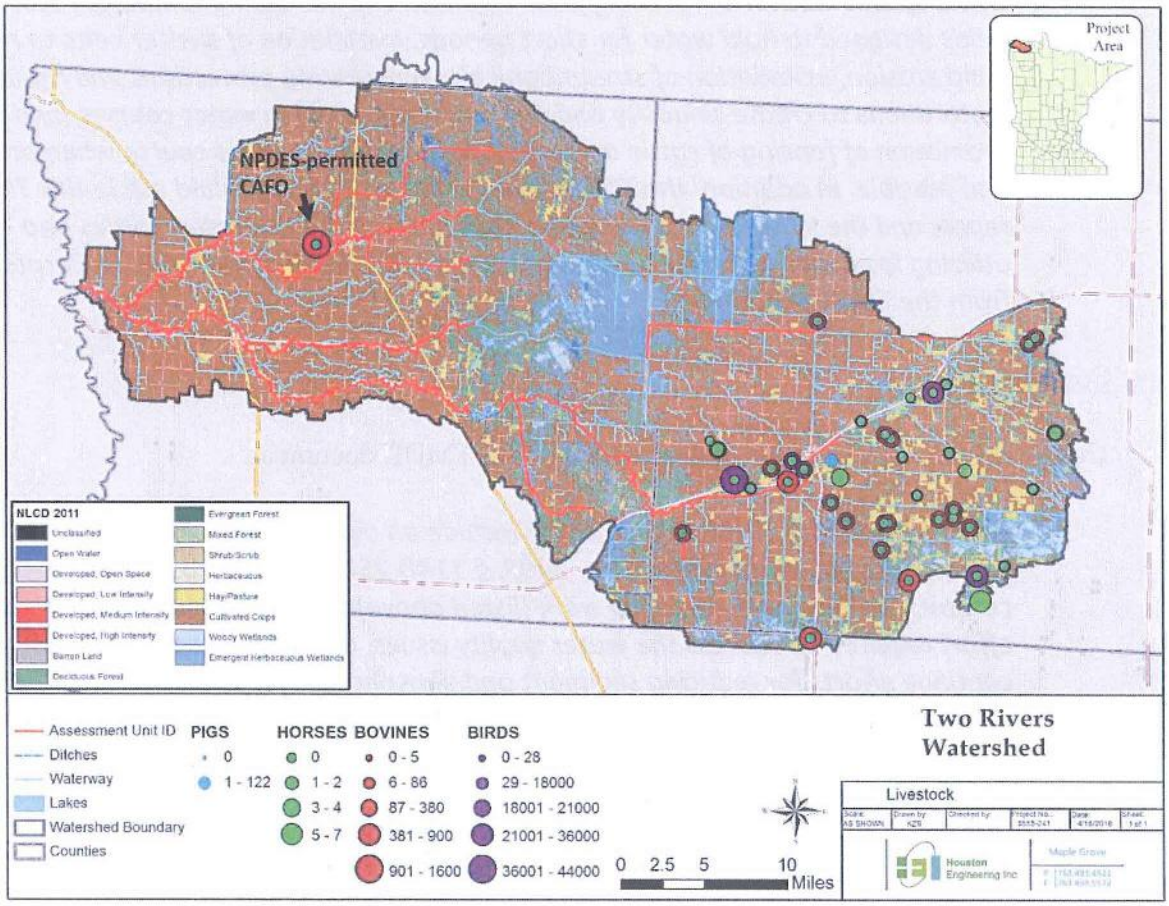

Figure 3-14: Location of registered feedlots and confined animal feedlot operations and permitted numbers of animals.

Excerpted from the TMDL document

Figures 3-16, 3-17, and 3-18 (see Review Section 1) of the TMDL document provide detailed and valuable information that can be used to guide the selection, prioritization, and siting of best management practices to control TSS inputs.

The TRWD have set goals in their WMP (TRWD 2004) to improve and sustain surface water quality and to reduce erosion and sedimentation. This includes reducing erosion and sedimentation to waterways and wetlands, restoring a more natural hydrograph to waters in the watershed and reducing the "flashiness" of the hydrograph, restoring and rehabilitating unstable stream channels, continuing to monitor water quality, and completing this TMDL report. TRWD's strategies to achieve their goals include utilizing BMPs to install buffer strips along ditch systems adjacent to ag fields (in line with Minnesota's 2016 Buffer Law), identify susceptible areas via monitoring and this TMDL report, utilizing grass waterways, restoring and creating new wetlands, reducing field drainage and increasing temporary storage in fields designed to hold water for short periods, installation of shelter belts to reduce wind erosion, installation of streambank bio-engineering protections and riparian restorations to create sinuosity and pools and riffles along water courses, and promotion of fencing of cattle and other livestock along water course when practical and feasible. In addition, the TRWD plans to adopt strategies laid out in this TMDL report and the WRAPS document with coordination of local communities and utilizing local and state agencies, such as the NRCS, DNR, and MPCA. [Excerpted from the TMDL document]

Cost Considerations

Cost estimates are discussed in Section 8.3 of the TMDL document.

The CWLA requires that a TMDL study include an overall approximation of implementation costs (Minn. Stat. 2007, § 114D.25). Based on cost estimates from current, planned, and proposed work (listed above) in the TRW and the level of effort required to address the water quality issues, a reasonable estimate to continue efforts for reducing sediment and phosphorus in the impaired reaches, addressed in this study, would be approximately $75 million dollars over ten years, including $35 million for the KCWRP. These dollars would be spent primarily on practices such as regional water retention projects, riparian vegetative buffers, sediment BMPs (water and sediment control basins and side inlets), pasture management, conservation tillage, vegetative practices, wetland restorations, rain gardens, urban BMPs, and structural practices (e.g. feedlot upgrades and improvements, grade stabilizations, grass waterways, etc.).
[Excerpted from the TMDL document]

The EPA finds that the TMDL document submitted by the MPCA satisfies the requirements of the tenth criterion. The EPA reviews but does not approve implementation plans.

An opportunity for public comment was provided and a summary of significant comments and the State's responses to those comments is included in/with the final TMDL submission.

> *An opportunity for public comment on the draft Two Rivers Watershed TMDL Report was provided via a public notice in the State Register from December 24, 2018, through January 23, 2019. No comments pertaining to the draft TMDL report were received.*
> *[Excerpted from the TMDL document]*

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

Section 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.

Section 12 Review Comments:

A submittal letter was transmitted along with the final TMDL report requesting approval of TSS and *E. coli* TMDLs for the Two Rivers Watershed on June 14th, 2019.

> *I am pleased to submit the Two Rivers Watershed Total Maximum Daily Load (TMDL) report, for impairments of total suspended solids (TSS) and Escherichia coli (E. coli), to the U.S. Environmental Protection Agency (EPA) for final review and approval.*
> *[Excerpted from the final submittal letter]*

The EPA finds that the submittal letter satisfies the requirements of the twelfth criterion.

Section 13: Conclusions

After a full and complete review, EPA finds that the TMDL study satisfies all of the elements of an approvable TMDL. The EPA is approving seven TMDLs for TSS and *E. coli*. The waterbody pollutant combinations to which this approval applies are listed in TMDL Review Table 3 below.

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

TMDL Review Table 3 - Final Approved TMDLs

AUID	Affected Use	Stream Name	Location/Reach Description	Pollutant
09020312-501	Aquatic Life	Two Rivers	M Br Two R to N Br Two R	TSS
09020312-509	Aquatic Life	Two Rivers	N Br Two R to Red R	TSS
09020312-501	Aquatic Recreation	Two Rivers	M Br Two R to N Br Two R	E-coli
09020312-503	Aquatic Recreation	Two River, Middle Branch	CD23 to S Br Two R	E-coli
09020312-505	Aquatic Recreation	Two River, South Branch	Lateral Ditch 2 to Lk Bronson	E-coli
09020312-506	Aquatic Recreation	Two River, South Branch	Unnamed ditch to Lateral Ditch 2 SD 95	E-coli
09020312-535	Aquatic Recreation	County Ditch 13	Unnamed ditch to Badger Cr (disconnected portion)	E-coli