



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

JUL 03 2008

REPLY TO THE ATTENTION OF:

WW-16J

Mr. Brad Moore  
Commissioner  
Minnesota Pollution Control Agency  
520 Lafayette Road North  
St. Paul, Minnesota 55155-4194

RECEIVED  
JUL 14 2008

Dear Mr. Moore:

The U. S. Environmental Protection Agency has reviewed the final Total Maximum Daily Loads from the Minnesota Pollution Control Agency for the Pipestone Creek Watershed in Minnesota. The TMDL is for Fecal Coliform and Turbidity, and addresses the recreational use and aquatic life impairment in this waterbody.

Based on this review, EPA has determined that Minnesota's TMDL for Fecal Coliform and Turbidity meets 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 six TMDLs for six impairments in the Pipestone Creek Watershed in Minnesota. 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 this TMDL and look forward to future TMDL submissions by the State of Minnesota. If you have any questions, please contact Kevin Pierard, Chief of the Watersheds and Wetlands Branch, at 312-886-4448.

Sincerely yours,

Tinka G. Hyde  
Acting Director, Water Division

Enclosure

cc: Chris Zadak, MPCA

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**TMDL:** Pipestone Creek, MN

**Effective Date:**

**Decision Document for Approval of  
Pipestone Creek, MN TMDL Report**

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

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

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

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

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

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

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

*Comment:*

Location/Description/Spatial Extent:

The Minnesota portion of the Pipestone Creek watershed is located in Pipestone County and the watershed area is approximately 151 square miles (96,577 acres). The watershed is within the Northern Glaciated Plains ecoregion and is a subwatershed of the Big Sioux River watershed of the Missouri River basin. Pipestone Creek flows from Minnesota into South Dakota, and back into Minnesota before converging with Split Rock Creek. Split Rock Creek converges with the Big Sioux River in southeastern South Dakota. The watershed has mostly dark-colored, gently sloping soils that formed in medium-textured or moderately fine textured wind- or glacier-deposited material. The original vegetation was tall and medium prairie grasses.

The executive summary and Table 1.1 of the Introduction section of the Pipestone Creek TMDL report and the table below describes the TMDL reaches and impairments. The Minnesota Pollution Control Agency (MPCA) listed three stream reaches; N Br Pipestone Cr to MN/SD border originally listed in 1994, Pipestone Creek, North Br; Headwaters to Pipestone Cr listed in 2004, and Main Ditch; CD A to Pipestone Cr Listed in 2004 as impaired for both excess fecal coliform bacteria and excess turbidity in the Minnesota portion of Pipestone Creek watershed. These impairments are currently on Minnesota's 2006 Section 303(d) list of impaired waters. In this TMDL both categories of impairment are addressed because MPCA believes that they share some common sources and, therefore, it will be more efficient to plan implementation efforts.

**Pipestone Creek watershed 303(d) fecal coliform and turbidity impairments**

Reach name on 303(d) list	Assessment unit ID	Monitoring Station	Impairment
Main Ditch; CD A to Pipestone Cr	10170203-527	Site 1 (S000-646)	Fecal, TSS (Turbidity)
Pipestone Creek, North Br; Headwaters to Pipestone Cr	10170203-514	Site 2 (S001-904)	Fecal, TSS (Turbidity)
Pipestone Creek; N Br Pipestone Cr to MN/SD border	10170203-501	Milestone (S000-099)	Fecal, TSS (Turbidity)

Land Use:

Land use is dominated by agricultural cropping and animal production. Pastureland makes up much of the riparian area. Upland cultivated land is dominated by corn and soybeans. Bottom lands along the creek are dominated by pasture, supporting numerous livestock operations. The land use is described in Figure 1.1, Section 2.2 and Table 2.1 of the Pipestone Creek TMDL report. It is approximately 87.3 percent agricultural; 8.4 percent grassland; and 1.2

urban/industrial areas.

Problem Identification:

These TMDLs address the Pipestone Creek impairments of aquatic life support and recreational uses from fecal coliform bacteria and turbidity. Pipestone Creek was placed on Minnesota's Section 303(d) list due to impairment of recreational and aquatic life uses as indicated by elevated levels of fecal coliform bacteria and turbidity.

Pollutant of Concern: Fecal coliform bacteria and TSS as a surrogate for Turbidity.

Source Identification:

Section 3.2 of the Pipestone Creek TMDL report states that the primary sources of fecal coliform bacteria are livestock on overgrazed riparian pasture, surface applied manure on cropland and feedlots lacking adequate runoff controls wild life, pets, and humans. Figure 3.5 of the Pipestone Creek TMDL report shows specific contributions from each of the source.

MPCA believes that the primary contributing sources of turbidity impairments are soil erosion in the riparian zone from livestock, streambank erosion/slumping from livestock, increasing flow related to land use and upland soil loss from row cropland and nutrient additions. A simplified turbidity model is presented in Figure 4.8 of the Pipestone Creek TMDL report that shows possible sources of turbidity impairments.

Priority Ranking:

The MPCA's projected schedule for TMDL completions, as indicated on Minnesota's 303(d) impaired waters list, implicitly reflects Minnesota's priority ranking of this TMDL. The project was scheduled to be completed in 2008. Ranking criteria for scheduling TMDL projects include, but are not limited to: impairment impacts on public health and aquatic life; public value of the impaired water resource; likelihood of completing the TMDL in an expedient manner, including a strong base of existing data and restorability of the waterbody; technical capability and willingness local stakeholders to assist with the TMDL; and appropriate sequencing of TMDLs within a watershed or basin.

Future Growth:

As stated in the General Watershed Characteristics section of the Pipestone Creek TMDL report, watershed's population has been declining in recent years. From 1990 to 2000, the population decreased 5.7%; therefore growth related concerns are in essence non existent.

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

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

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

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

*Comment:*

### Designated Use of Waterbody:

According to Minn. Rules Ch. 7050.0470, the impaired reaches covered in this TMDL are classified as Class 2C, 3B, 3C, 4A, 4B, 5 and 6 Water. Class 2C is the most stringent of these categories for aquatic life use and recreational use. The designated beneficial use for 2C waters is as follows:

Aquatic life support and recreation, includes boating and other forms of recreation for which the water may be suitable (i.e., swimming). Class 2C waters may also support indigenous aquatic life, but not necessarily sport or commercial fish.

### Water Quality Standard for Fecal Coliform:

Minn. Rules Ch. 7050.0222 subpart 5, fecal coliform water quality standard for Class 2C waters, states that fecal coliform concentrations shall “not exceed 200 organisms per 100 milliliters as a geometric mean of not less than five samples in any calendar month, nor shall more than ten percent of all samples taken during any calendar month individually exceed 2000 organisms per 100 milliliters. The standard applies only between April 1 and October 31.”

While Minnesota currently uses fecal coliform bacteria as its standard the MPCA is proposing to change this to an *E. coli* standard. As stated in 3.3, page 23 of the Pipestone Creek TMDL report, change takes into account water analysis studies that show an average of 63 % of fecal coliform to be *E. coli* and thereby sets *E. coli* standards. In the event of switch to *E. coli* standard, to adapt the fecal coliform TMDL allocations to *E. coli* standards, fecal coliform allocations will be multiplied

by 0.63 to convert to *E.coli*.

Target:

The target is the standard as stated above, for both the geometric mean portion (200 organisms/100mL) and the daily maximum portion (<10% of the samples exceed 2000 organisms/100mL), which is applicable from April 1<sup>st</sup> through October 31<sup>st</sup>. If the numeric standard is met, then, Pipestone Creek should meet the assigned designated use.

Water Quality Standard for Turbidity:

The components of turbidity in streams include suspended sediments, organic material, dissolved salts and stains that scatter light in the water column making the water appear cloudy. Minn. Rules Ch. 7050.0222 subpart 5, turbidity water quality standard for Class 2C waters, is 25 nephelometric turbidity units (NTUs). Essentially, listings occur when greater than ten percent of data points collected within the previous ten-year period exceed the 25 NTU standard. The Pipestone Creek TMDL will focus primarily on the suspended sediment and organic material components, as they appear to be the primary factors for Pipestone Creek. In order to evaluate and set loads the surrogate measure total suspended solids (TSS) is used. This is possible because most water samples taken for this project were analyzed for both turbidity and TSS. A simple regression of these two parameters was done and shows a good correlation (R-squared = 0.85; Figure 4.1 of the Pipestone Creek TMDL report). This analysis indicated that the turbidity standard of 25 NTU corresponds to a TSS concentration of 54 mg/L for this dataset.

Target:

Target as stated above is that turbidity standard of 25 NTU corresponds to a TSS concentration of 54 mg/L for Pipestone Creek TMDL.

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

### **3. Loading Capacity - Linking Water Quality and Pollutant Sources**

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

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

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

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

*Comment:*

Fecal Coliform Loading Capacity:

MPCA has determined that the loading capacity for the impaired waterbodies by Load Duration Curve method, which is  
 Load = (concentration) x (flow).

Fecal coliform loading capacities and allocations—Pipestone Creek; N Br Pipestone Cr to MN/SD border

AUID: 10170203-501	FLOW ZONE				
	High	Moist	Mid	Dry	Low
	Billion organisms per day				
<b>Average Total Daily Loading Capacity</b>	541	139	61	32	12
<b>Wasteload Allocation</b>					
Pipestone Wastewater Treatment Facility	25	25	25	25	*
Livestock Facilities Requiring NPDES Permits **	0	0	0	0	0
"Straight Pipe" Septic Systems	0	0	0	0	0
<b>Load Allocation</b>	286	57	20	7	*
<b>Margin of Safety</b>	231	57	17	Implicit	Implicit

\* From section 3.3 of the TMDL report. Flow based load; Allocation = (flow from given source) x (200 organisms/100mL)

\*\* Individual facilities are listed in Table 3.2. of the TMDL Report

Fecal coliform loading capacities and allocations—Pipestone Creek, North Br; Headwaters to Pipestone Cr

AUID: 10170203-514	FLOW ZONE				
	High	Moist	Mid	Dry	Low
	Billion organisms per day				
<b>Average Total Daily Loading Capacity</b>	287	74	33	17	6
<b>Wasteload Allocation</b>					
Livestock Facilities Requiring NPDES Permits*	0	0	0	0	0
"Straight Pipe" Septic Systems	0	0	0	0	0



<b>Load Allocation</b>	165	43	24	9	3
<b>Margin of Safety</b>	123	30	9	7	4

- The individual facilities are listed in Table 3.4 of the TMDL Report.

Fecal coliform loading capacities and allocations—Main Ditch; CD A to Pipestone Cr

AUID: 10170203-527	FLOW ZONE				
	High	Moist	Mid	Dry	Low
	Billion organisms per day				
<b>Average Total Daily Loading Capacity</b>	142	37	16	8	3
<b>Wasteload Allocation</b>					
"Straight Pipe" Septic Systems	0	0	0	0	0
<b>Load Allocation</b>	81	21	12	5	1
<b>Margin of Safety</b>	61	15	4	4	2

TSS (Turbidity) Loading Capacity:

MPCA has determined that the loading capacity for the impaired waterbodies is the TSS equivalent for the turbidity standard multiplied by flow for various flow regimes. Same flow records and USGS gauge is used for TSS data.

TSS loading capacities and allocations—Pipestone Creek; N Br Pipestone Cr to MN/SD border

AUID: 10170203-501	FLOW ZONE				
	High	Moist	Mid	Dry	Low
	Tons TSS per day				
<b>Total Daily Loading Capacity</b>	16.1	4.1	1.8	0.9	0.3
<b>Wasteload Allocation</b>					
Pipestone Wastewater Treatment Facility	0.6	0.6	0.6	*	*
Lincoln Pipestone Holland Well Water Trt Fac	0.02	0.02	0.02	*	*
Construction Stormwater (NPDES)	0.05	0.009	0.002	*	*
Industrial Stormwater (NPDES)	0.03	0.005	0.001	*	*
<b>Load Allocation</b>	8.6	1.8	0.7	*	*
<b>Margin of Safety</b>	6.9	1.7	0.5	Implicit	Implicit

\*Flow based load; Allocation= (flow from given source) x (X mg/L TSS) where X equals 45 for the City of pipestone wastewater Treatment facility, 30 for the Lincoln Pipestone Holland Well Water Treatment facility and 54 for all other sources.

TSS loading capacities and allocations—Pipestone Creek, North Br; Headwaters to Pipestone Cr

AUID: 10170203-514	FLOW ZONE				
	High	Moist	Mid	Dry	Low
	Tons TSS per day				
<b>Total Daily Loading Capacity</b>	8.5	2.2	1.0	0.5	0.2
<b>Wasteload Allocation</b>					
Lincoln Pipestone Holland Well Water Trt Fac	0.02	0.02	0.02	0.02	0.02
<b>Load Allocation</b>	4.9	1.3	0.7	0.3	0.06
<b>Margin of Safety</b>	3.6	0.9	0.3	0.2	0.1

TSS loading capacities and allocations—Main Ditch; CD A to Pipestone Cr

AUID: 10170203-527	FLOW ZONE				
	High	Moist	Mid	Dry	Low
	Tons TSS per day				
<b>Total Daily Loading Capacity</b>	4.2	1.1	0.5	0.2	0.09
<b>Wasteload Allocation</b>					
<b>Load Allocation</b>	2.4	0.6	0.3	0.1	0.04
<b>Margin of Safety</b>	1.8	0.4	0.1	0.1	0.05

Method for cause-and-effect relationship:

Fecal Coliform

Load duration analysis was used to integrate flow and the fecal coliform bacteria standard to provide loading capacity across the flow record as well as comparisons to the loading capacity using collected water quality data. MPCA provided a more complete explanation of load duration curves and how they were derived in Appendix D of the Pipestone Creek TMDL. Allocations in the duration curve approach for each impaired stream reach are developed for the full range of flows in the watershed using the daily flow records at the US Geological Survey (USGS) gage station #06482610 below Pipestone Creek on Split Rock Creek in Corson, South Dakota from 1984-2005. This flow record contains 3561 average daily flow values, however this flow record did not have data from 1990-2000. To estimate flow at the ends of the three listed reaches it was assumed that the flow at those reaches was proportional to the Corson site based on respective drainage areas represented. The project did have one year of flow data at Sites 1 and 2, but it was decided that for a duration curve approach a much longer record representing a greater range of flows is needed. MPCA compared the calculated flows to the available flow data for Sites 1 and 2 and determined that the magnitudes were generally similar between the actual vs. proportionally-calculated flows.

Turbidity

Similarly, load duration analysis was used to integrate flow and the TSS equivalent to the turbidity standard to provide loading capacity across the flow record as well as comparisons to the loading capacity using collected water quality data. MPCA provided a more complete explanation of load duration curves and how they were derived in Appendix D of the Pipestone Creek TMDL. A summary of the data used in this report is provided in Table 4.1 of the Pipestone Creek TMDL report. The full dataset is provided in Appendix A of the Pipestone Creek TMDL. The turbidity dataset used was from 1998 to 2001 at the Milestone Site and from 2002 to 2004 at the two project monitoring stations (Sites 1 and 2). The two project monitoring stations make up the bulk of the overall project dataset. However, TSS data at the Milestone Site goes back to 1963 which provides a long-term trend at the site, as shown in Figure 4.2 of the Pipestone TMDL report. Figures 4.3 through 4.5 of the Pipestone TMDL report show load duration curves which integrate flow and the TSS equivalent to the turbidity standard to provide loading capacity across the flow

record as well as comparisons to the loading capacity using collected water quality data.  
Analysis

The load duration curve approach allows MPCA to determine which implementation practices are most effective at reducing bacteria and turbidity loads based on flow regime. For example, if exceedances are significant during storm events, implementation efforts can target those best management practices (BMPs) that will reduce storm water run-off and this in turn will allow for a more efficient implementation effort. The load duration curve is a cost-effective TMDL approach, while still addressing the reductions necessary to meet WQS.

A weakness of the TMDL analysis is that nonpoint source load allocations were not assigned to specific sources within the watershed. However, EPA believes the weakness discussed in this TMDL is outweighed by the strengths of the TMDL approach and is appropriate based on the information available. In the event that fecal coliform bacteria and turbidity levels do not meet WQSs in response to implementation efforts described in the Pipestone Creek TMDL Report, the TMDL strategy may be amended as new information on the watershed is developed, to better account for contributing sources of the impairment and to determine where reductions in the Pipestone Creek are most appropriate.

#### Critical Condition:

Fecal coliform levels are generally at their worst following significant storm events during the summer months, as described in Section 3.1 of the Pipestone Creek TMDL report. This section further spelled out overall seasonal variation, indicating that the fecal coliform levels appear to be below standard in April and May and above the standard from June through October. These conditions and variation are fully captured in the duration curve methodology used in this TMDL.

Turbidity levels are generally at their worst following significant storm events during the spring and summer months, as described in Section 4.1 of the Pipestone Creek TMDL report. This section also addressed seasonal variation, which was somewhat more difficult to generalize given reach-specific differences. These conditions and variation are fully captured in the duration curve methodology used in this TMDL.

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

#### **4. Load Allocations (LAs)**

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

*Comments:*

Fecal Coliform

Methodology for Load Allocations:

Load duration curve approach was used for all allocations for each impaired stream reach, and loads were developed for full range of flows in the watershed using the daily flow records at the US Geological Survey (USGS) gage station #06482610, below Pipestone Creek on Split Rock Creek in Corson, South Dakota from 1984-2005. To estimate flow at the ends of the three listed reaches it was assumed that the flow at those reaches was proportional to the Corson site based on respective drainage areas represented. For each impaired reach and flow condition, the total loading capacity (TMDL) was divided into its component WLA, LA, and MOS.

Fecal Coliform Load Allocations:

- Once the WLA and MOS were determined for a given reach and flow zone, the remaining loading capacity was considered LA. The LA includes nonpoint pollution sources that are not subject to NPDES permit requirements, as well as “natural background” sources such as wildlife. The nonpoint pollution sources are largely related to livestock production, inadequate human wastewater treatment (non-straight-pipes), and city stormwater runoff.

Additional Daily Loading Capacity and Allocations:

- The TMDLs and allocations are “average daily loading values calculated within a calendar month” based on monthly geometric mean below 200 organisms/100 ml and the loading capacity and allocations must also meet a maximum single day load of 2000 organisms/100mL. TMDL allocations for the individual impaired reaches are provided above in Section 3 and also in Tables 3.3, 3.5, and 3.6 of the Pipestone Creek TMDL Report.

TSS (Turbidity)

Methodology for Load Allocations:

As described in Section 4.1 of the Pipestone Creek TMDL report, TSS is used as a surrogate for turbidity based on a good correlation between the two, with the turbidity standard of 25 NTU being equivalent to 54 mg/L TSS. The nutrients (i.e., phosphorus) may play a role in turbidity during portions of the year; however, due to lack of available data, an adequate correlation between nutrients, algae and turbidity could not be established. MPCA believes that reducing the delivery of sediment will also reduce the delivery of nutrients.

Turbidity Load Allocations:

- Once the WLA and MOS were determined for a given reach and flow zone, the remaining loading capacity was considered LA. The LA includes nonpoint pollution sources that are not subject to NPDES permit requirements, and natural background sources such as low levels of soil/sediment erosion from both upland areas and the stream channel. The nonpoint pollution sources were described previously and include upland and riparian erosion and bank/bed erosion, as well as the other sources. TMDL allocations for the individual impaired reaches are provided above in Section 3 of this document and also in Tables 4.2, 4.3, and 4.4 of the Pipestone Creek TMDL Report.

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

## **5. Wasteload Allocations (WLAs)**

EPA regulations require that a TMDL include WLAs, which identify the portion of the loading capacity allocated to individual existing and future point source(s) (40 C.F.R. §130.2(h), 40 C.F.R. §130.2(i)). In some cases, WLAs may cover more than one discharger, e.g., if the source is contained within a general permit.

The individual WLAs may take the form of uniform percentage reductions or individual mass based limitations for dischargers where it can be shown that this solution meets WQSs and does not result in localized impairments. These individual WLAs may be adjusted during the NPDES permitting process. If the WLAs are adjusted, the individual effluent limits for each permit issued to a discharger on the impaired water must be consistent with the assumptions and requirements of the adjusted WLAs in the TMDL. If the WLAs are not adjusted, effluent limits contained in the permit must be consistent with the individual WLAs specified in the TMDL. If a draft permit provides for a higher load for a discharger than the corresponding individual WLA in the TMDL, the State/Tribe must demonstrate that the total WLA in the TMDL will be achieved through reductions in the remaining individual WLAs and that localized impairments will not result. All permittees should be notified of any deviations from the initial individual WLAs contained in the TMDL. EPA does not require the establishment of a new TMDL to reflect these revised allocations as long as the total WLA, as expressed in the TMDL, remains the same or decreases, and there is no reallocation between the total WLA and the total LA.

### *Comments:*

As discussed in the Sections 3.3 and 4.3 of the Pipestone Creek TMDL report and above, MPCA has determined that the WLA for both fecal coliform and TSS following process.

### **Fecal Coliform Wasteload Allocation:**

- For the City of Pipestone wastewater treatment facility the WLA was determined based on their permitted discharge volume from their pond (based on six inches per day drawdown) and their permitted concentration limit (200 organisms/100 ml). A daily WLA is assigned

to this facility, even though discharge occurs during April 1 through June 15 and September 15 through December 15.

- Straight-pipe septic systems are illegal and unpermitted, and as such are assigned a zero WLA.
- Livestock facilities that have been issued NPDES permits are assigned a zero WLA. This is consistent with the conditions of the permits, which do not allow pollutant discharge from the livestock housing facilities and associated sites. Discharge of fecal coliform from fields where manure has been land-applied may occur at times. Such discharges are covered under the LA portion of the TMDLs, provided the manure is applied in accordance with the permit.
- The total daily loading capacities in the dry and low flow zone are very small due to the occurrence of very low flows in the long-term flow records. Consequently, for one of the impaired reaches (Pipestone Creek; N Br Pipestone Cr to MN/SD border), the permitted wastewater treatment facility design flows exceed the stream flow at the low flow zone. Actual flow from the treatment facility can never exceed stream flow as it is a component of stream flow. For the dry flow zone the calculated MOS would take up all of the remaining allocation capacity. To account for these unique situations only, the WLAs and LAs are expressed as an equation rather than an absolute number. The equation is:

$$\text{Allocation} = (\text{flow contribution from a given source}) \times (200 \text{ organisms}/100 \text{ mL})$$

In essence, MPCA assigned a concentration-based limit to the nonpoint LA sources for the dry and low flow zone. The WLAs for straight pipe septic systems and NPDES-permitted livestock operations remain at zero. Actual loads are provided in section 3 of this document.

#### TSS (Turbidity) Wasteload Allocation:

- For the City of Pipestone wastewater treatment facility and the Lincoln Pipestone Rural Water Holland Well water treatment facility their WLAs were determined based on their permitted discharge volumes from their ponds and permitted TSS concentration limits. A daily WLA is assigned to these facilities even though discharge occurs during April 1 through June 15 and September 15 through December 15.
- The WLA for construction and industrial stormwater is less than one percent of the TMDL and load is difficult to quantify. Construction storm water activities are considered in compliance with provisions of the TMDL if they obtain a Construction General Permit under the NPDES program and properly select, install and maintain all BMPs required under the permit, or meet local construction stormwater requirements if they are more restrictive than requirements of the State General Permit. Industrial storm water activities are considered in compliance with provisions of the TMDL if they obtain an industrial stormwater general permit or General Sand and Gravel general permit (MNG49) under the NPDES program and properly select, install and maintain all BMPs required under the permit.
- As with the calculations for the fecal coliform (Section 3.0 of the Pipestone Creek TMDL report), the total daily loading capacities in the dry and low flow zone are very small due

to the occurrence of very low flows in the long-term flow records. Consequently, for one of the impaired reaches (Pipestone Creek; N Br Pipestone Cr to MN/SD border), the permitted wastewater treatment facility design flows exceed the stream flow at the low flow zone. Actual flow from the treatment facility can never exceed stream flow as it is a component of stream flow. For the dry flow zone the calculated MOS would take up all of the remaining allocation capacity. To account for these unique situations only, the WLAs and LAs are expressed as an equation rather than an absolute number. This equation is:

$$\text{Allocation} = (\text{flow contribution from a given source}) (X \text{ mg/L TSS}),$$

where *X* equals 45 for the City of Pipestone wastewater treatment facility, 30 for the Lincoln Pipestone Rural Water Holland Well, and 54 for all other sources.

In essence, MPCA assigned a concentration-based limit to the sources for the dry and low flow zone. See section 3 of this document for the calculated loads.

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

## **6. Margin of Safety (MOS)**

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

### *Comments:*

As discussed in the Section 3.3 and 4.3 of the Pipestone Creek TMDL report and the explicit margins of safety were calculated as the difference between the loads occurring during median flows and minimum flows in each zone.

- MPCA believes that the allocations are a direct function of daily flows, and accounting for potential flow variability is an appropriate way to address the MOS. Basically, the margins of safety were calculated as the difference between the loads corresponding to the median flow and minimum flow in each zone. This is done within each of the five flow zones for both the fecal coliform and TSS (turbidity) TMDLs. MOS for the individual impaired reaches are provided above in Section 3 of this document and also in Tables 4.2, 4.3, and 4.4 of the Pipestone Creek TMDL Report.

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

*element.*

## **7. Seasonal Variation**

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

### *Comments:*

MPCA stated that the fecal coliform levels are generally at their worst following significant storm events during the summer months, as described in Section 3.1 of the Pipestone Creek TMDL report. This section discussed the overall seasonal variation, indicating that the fecal coliform levels appear to be below standard in April and May and above the standard from June through October.

Turbidity levels are generally at their worst following significant storm events during the spring and summer months, as described in Section 4.1 of the Pipestone Creek TMDL report. This section also addressed seasonal variation in each impaired reach and reach specific variations were addressed in the duration curve methodology.

Allocations in the duration curve approach for each impaired stream reach are developed for the full range of flows in the watershed using the daily flow records from 1984-2005. This flow record contains 3561 average daily flow values, although this flow record did not have data from 1990-2000, sheer number of daily flow values also addressed the seasonal variations.

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

## **8. Reasonable Assurances**

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

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



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

*Comments:*

The following should be considered as reasonable assurance that implementation will occur and result in fecal coliform and TSS load reductions in the reaches of Pipestone Creek to meet their designated uses.

- The Best Management Practices (BMPs) and other actions outlined in Section 6.0 of the Pipestone Creek TMDL report have been determined to be effective in reducing transport of pollutants to surface water and, many of these actions are currently being promoted by local resource managers.
- The advisory committee formed to provide feedback and input into the project had broad representation from government, citizens, and agricultural experts.
- The Pipestone County Water Plan includes several goals, objectives and guidelines related to the impairments addressed in this report and indicate the intent to proactively participate in getting waters off the Minnesota's Section 303(d) list.
- TMDL studies and implementation plans have been done downstream of these impaired reaches in South Dakota. This will contribute to raising awareness of the problems and a sense that all landowners in the area will need to play a role.
- Monitoring will be conducted to track progress and suggest adjustment in the implementation approach.

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

## **9. Monitoring Plan to Track TMDL Effectiveness**

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

*Comments:*

The goal of this monitoring plan is to assess the effectiveness of source reduction efforts for attaining water quality standards and designated uses. The impaired reaches will remain listed

until water quality standards are met.

Monitoring of *E. coli* (if the proposed rule change from fecal coliform to *E. coli* occurs) will be done at the same sites that were monitored for assessment/study purposes and will be done five times per month from April 1 through October 31.

A similar schedule will be done for turbidity. This monitoring will be done for a minimum of two seasons and will begin after a period of time that substantial implementation has taken place, approximately five to seven years from now and if funding for implementation and monitoring is available. The monitoring data will dictate the need for additional implementation and follow-up monitoring.

Monitoring will be conducted by Pipestone County Conservation and Zoning Office and it is expected that funding for analysis will be through the MPCA.

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

## **10. Implementation**

EPA policy encourages Regions to work in partnership with States/Tribes to achieve nonpoint source load allocations established for 303(d)-listed waters impaired by nonpoint sources. Regions may assist States/Tribes in developing implementation plans that include reasonable assurances that nonpoint source LAs established in TMDLs for waters impaired solely or primarily by nonpoint sources will in fact be achieved. In addition, EPA policy recognizes that other relevant watershed management processes may be used in the TMDL process. EPA is not required to and does not approve TMDL implementation plans.

### *Comments:*

The Pipestone Creek TMDL does not contain a formal implementation plan. EPA is not required to, and therefore does not approve TMDL implementation plans. However, MPCA did identify some implementation activities that will work toward meeting the WQS in Pipestone Creek. Some of the activities are listed below.

Section 6.0 of the Pipestone Creek TMDL report provides an overview of implementation options and considerations to address the fecal coliform bacteria and turbidity (TSS) TMDLs. MPCA stated that a more detailed implementation plan will be developed following approval of the Pipestone Creek TMDL. MPCA believes that fecal coliform bacteria and turbidity have several sources and delivery pathways in common; therefore it will make sense to address implementation efforts together.

A Best Management Practice (BMP) matrix that offers a range of appropriate implementation options are provided in Appendix E which provides options based on an agroecoregion and is focused on turbidity impairments which may have applicability to other runoff-driven pollutants. These options include the following:

- \*Good animal and manure management practices include livestock exclusion from streams, limiting manure applications to frozen ground.
- \*Liquid manure waste holding facilities should be properly sited and designed to minimize seepage and overflow.
- \*The Manure Application Planner is recommended for nutrient management.
- \*Conservation tillage, and conservation crop rotations are recommended to reduce soil erosion.
- \*Protection of ground water quality from nitrate contamination is a high priority in this agroecoregion. Nitrogen fertilizer applications should be based on realistic crop yield goals, nitrogen credits from legumes and manure, and an N soil test.

Additional actions to specifically address the fecal coliform impact include upgrading of noncompliant septic systems and correction of feedlots with runoff problems.

Streambank erosion was identified as an important contributing source to the turbidity problem. Due to potential high cost of streambank restoration, these projects will be prioritized based on magnitude of apparent contribution.

The Pipestone County Conservation and Zoning Office staff is currently promoting existing program and cost-share assistance to interested producers within the watershed to resolve issues. Some of these programs include Environmental Quality Improvement Program, State Cost-share, Ag BMP loan program, Conservation Reserve Enhancement Program and Conservation Reserve Program. Finally, MPCA staff is trying to work with counterparts in South Dakota to coordinate implementation efforts.

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

## **11. Public Participation**

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

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

*Comments:*

An advisory group was assembled from federal and state agencies, local governments and landowners. Two public meetings were held. The first meeting focused on the purpose of the project, monitoring results and data and information needs. The second meeting focused on preliminary conclusions with regard to sources and implementation options.

The second public meeting was held in December 2006 to present key findings, outline future actions and address questions and concerns. An opportunity for further public comment on the draft TMDL was provided via a public notice in the State Register and the MPCA website that announced a 30-day comment period, from May 14, 2007 to June 15, 2007. MPCA received comment letters from Mr. Kevin Paap of Minnesota Farm Bureau Federation and Mr. Joe Martin of Minnesota Department of Agriculture. Both letters were adequately addressed by Chris Zadak of MPCA.

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

## **12. Submittal Letter**

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

### *Comment:*

The second transmittal letter was dated June 20, 2008, from Brad Moore, Commissioner, MPCA, to Kevin Pierard, Acting Division Director, U.S.EPA Region 5 EPA. The letter stated clearly that the Pipestone Creek TMDL submittal is for final approval under Section 303(d) of the CWA. The letter also contains the name of the watershed as it appears on the Minnesota's Section 303(d) list, and the pollutant of concern, and period that this TMDL Study was re-public noticed, from March 31, 2008 through April 30, 2008.

*EPA finds that the TMDL documents submitted by MPCA satisfy all requirements of this twelfth element.*

## **13. Conclusion**

After a full and complete review, EPA finds that the TMDLs for the Pipestone Creek Watershed satisfy all of the elements of an approvable TMDL. This approval document is for three water body segments that are impaired by Fecal Coliform and TSS for a total of 6 TMDLs addressing six impairments from the 2006 Minnesota's Section 303(d) list. EPA's approval of this document does not extend to those waters that are within Indian Country, as defined in 18 U.S.C.

Section 1151. EPA is taking no action to approve or disapprove TMDLs for those waters at this time. EPA or eligible Indian Tribes as appropriate will retain responsibilities under CWA Section 303(d) for those waters.

### Pipestone Creek Watershed Impairments

<b>Reach name on 303(d) list</b>	<b>Assessment unit ID</b>	<b>Monitoring Station</b>	<b>Impairment</b>
Main Ditch; CD A to Pipestone Cr	10170203-527	Site 1 (S000-646)	Fecal, TSS (Turbidity)
Pipestone Creek, North Br; Headwaters to Pipestone Cr	10170203-514	Site 2 (S001-904)	Fecal, TSS (Turbidity)
Pipestone Creek; N Br Pipestone Cr to MN/SD border	10170203-501	Milestone (S000-099)	Fecal, TSS (Turbidity)

