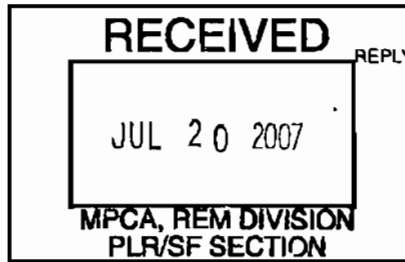




UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

FILED
JUL 23 2007



REPLY TO THE ATTENTION OF

WW-16J

July 13, 2007

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

Dear Mr. Moore:

The United States Environmental Protection Agency (U.S. EPA) has conducted a complete review of the final Lower Cannon River Total Maximum Daily Load for turbidity including supporting documentation and information. Based on this review, U.S. EPA determined that Minnesota's Total Maximum Daily Loads (TMDLs) for two impaired reaches within the Lower Cannon River watershed, addressing two impairments of turbidity, meet the requirements of Section 303(d) of the Clean Water Act and U.S. EPA's implementing regulations at 40 C.F.R. Part 130. Therefore, by this letter, U.S. EPA hereby approves two TMDLs addressing two impairments on two impaired reaches within the Lower Cannon River watershed. The statutory and regulatory requirements and U.S. EPA's review of Minnesota's compliance with each requirement are described in the enclosed decision document.

We appreciate your hard work in this area and the submittal of the TMDLs as required. If you have any questions, please contact Kevin Pierard, Chief of the Watersheds and Wetlands Branch, at 312-886-4448.

Sincerely yours,

Linda Holst
Acting Director, Water Division

Enclosure

cc: Jeff Risberg, MPCA
Dave L. Johnson, MPCA
Lee Ganske, MPCA

**TMDL Decision Document
Lower Cannon River Turbidity TMDLs**

Total Maximum Daily Load (TMDL) Decision Document

TMDL: Total Maximum Daily Load Evaluation of Turbidity Impairments in the Lower Cannon River
Status: Final

Date of U.S. EPA Decision: July 13, 2007

Water Bodies Addressed by TMDLs as listed in Category 5:

- Cannon River, HUC boundary in Rice Lake Bottoms to Vermillion Slough/Mississippi River, Assessment Unit ID 07040001-511
- Cannon River, Pine Creek to Belle Creek, Assessment Unit ID 07040002-502

Impairment/Pollutant: Two reaches of the Lower Cannon River have been included in Category 5 of Minnesota's 2006 Integrated Report (IR) as not meeting the aquatic life use due to turbidity water quality standard exceedances. Minnesota has identified total suspended solids (TSS) as the pollutant of concern for both TMDLs.

Background: Both of the impaired reaches are in the Cannon River watershed. Assessment unit 07040001-511, referred to in the TMDL report as the Confluence reach, has been identified by the Minnesota Pollution Control Agency (MPCA) as impaired due to excessive turbidity since 1996. In 2004 MPCA identified assessment unit 07040002-502, the Pine-Belle reach, as also being impaired due to excessive turbidity. Interested citizens began monitoring at sites within the Cannon River watershed as early as 1999. Public involvement in the development of the TMDLs began in June 2003 with the creation of a steering committee. In July 2005 technical committee meetings began. The Cannon River Watershed Partnership took an active role in drafting the TMDL report. The TMDL report was on public notice for review and comment from November 6 to December 6, 2006. Subsequent to the close of the public notice, MPCA made revisions to the TMDL report and a final TMDL package for U.S. EPA review and approval was received by U.S. EPA on May 15, 2007. MPCA submitted additional information for U.S. EPA's consideration on May 30 and June 11, 2007.

Conclusion: After a full and complete review of the TMDL Report and supporting documents, U.S. EPA finds that pursuant to Section 303(d) of the Clean Water Act, 33 U.S.C. Section 1313(D), and U.S. EPA's implementing regulations at 40 CFR Part 130, the TMDLs for the Confluence reach and the Pine-Belle reach satisfy the elements of approvable TMDLs. This approval addresses a total of two turbidity impairments as identified in Category 5 of Minnesota's 2006 IR. Load allocations (LA), wasteload allocations (WLA), and an explicit margin of safety (MOS) were established for five flow zones for each of the impaired reaches. The final approved TMDLs and associated allocations are in Table 1 of this decision document and in the revised Table 6 of the TMDL report¹.

U.S. EPA's approval of these TMDLs extends to the water bodies which are identified in Table 1 of this decision document, with the exception of any portions of the water bodies that are within Indian Country, as defined in 18 U.S.C. Section 1151. At this time, U.S. EPA is taking no action to approve or disapprove these TMDLs with respect to those portions of the water bodies within Indian Country. U.S. EPA, or

¹ MPCA submitted a revised Table 6 to the TMDL report as an attachment to a June 11, 2007 electronic mail message from Lee Ganske, MPCA, to Julianne Socha, U.S. EPA.

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eligible Indian Tribes, as appropriate, will retain responsibilities under Section 303(d) for these water bodies or portions of these water bodies within Indian Country.

**TMDL Decision Document – Table 1
Lower Cannon River Turbidity TMDLs**

Impaired Reach	Assessment Unit ID		TMDL/Allocations/MOS (tons/day)				
			High Flows	Moist Conditions	Mid-Range Flows	Dry Conditions	Low Flows
Cannon River, HUC boundary in Rice Lake Bottoms to Vermillion Slough/Mississippi River	07040001-511	Total Daily Loading Capacity	412	144	82	49	31
		WLA – WWTP & Industrial Facilities	7.0	7.0	7.0	7.0	7.0
		WLA – MS4 Communities	13.1	4.6	3.0	1.5	0.6
		WLA – NPDES Construction Stormwater	2.6	0.9	0.6	0.3	0.1
		WLA – NPDES Industrial Stormwater	1.3	0.5	0.3	0.2	0.1
		LA	246	87	56	28	11
		MOS	142	44	15	12	12
		Cannon River, Pine Creek to Belle Creek	07040002-502	Total Daily Loading Capacity	381	134	76
WLA – WWTP & Industrial Facilities	7.0	7.0		7.0	7.0	7.0	
WLA – MS4 Communities	12.1	4.3		2.7	1.4	0.5	
WLA – NPDES Construction Stormwater	2.4	0.9		0.5	0.3	0.1	
WLA – NPDES Industrial Stormwater	1.2	0.4		0.3	0.1	0.1	
LA	227	80		51	25	10	
MOS	131	41		14	11	11	

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**U.S. EPA REVIEW OF THE ELEMENTS OF THE LOWER CANNON RIVER WATERSHED
TMDLs FOR TURBIDITY**

Section 303(d) of the Clean Water Act (CWA) and U.S. EPA's implementing regulations at 40 CFR Part 130 describe the statutory and regulatory requirements for approvable TMDLs. Additional information is generally necessary for U.S. EPA to determine if a submitted TMDL fulfills the legal requirements for approval under Section 303(d) of the CWA and U.S. 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 U.S. EPA to determine if a submitted TMDL is approvable.

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 pollutant for which the TMDL is being established, and the priority ranking of the water body. 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 U.S. 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 assumed distribution of land use (e.g., urban, forested, agriculture); (2) population characteristics, wildlife resources, and other relevant information affecting the characterization of the pollutant of concern and its allocation to sources; (3) present and future growth trends, if taken into consideration in preparing the TMDL; and (4) 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.*

Identification of Water Bodies:

Section 1.2 and Figure 2 of the TMDL report identify two impaired reaches of the Cannon River as the subject of the TMDLs; AUID 07040001-511, Cannon River, HUC Boundary in Rice Lake Bottoms to Vermillion Slough/Mississippi River, and AUID 07040002-502, Cannon River, Pine Creek to Belle Creek, referred to throughout the TMDL report and this decision document as the Confluence reach and the Pine-Belle reach, respectively. Both of the impaired reaches are located within the Cannon River watershed. Because the Cannon River watershed is relatively large, approximately 941,000 acres covering portions of eight counties in southeast and south-central Minnesota, MPCA noted in the TMDL report that the Cannon River watershed is divided into four subwatershed lobes; one lobe is the Lower Cannon River watershed. The Lower Cannon River watershed includes the portion of the

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Cannon River running from the Byllesby Reservoir to the mouth of the river at the Mississippi River in the city of Red Wing. The Lower Cannon River watershed is approximately 20% of the Cannon River watershed. The Confluence and the Pine-Belle reach fall within the Lower Cannon River watershed. Figure 1 of the TMDL report displays the four subwatershed lobes within the Cannon River watershed.

Pollutant of Concern:

Both the Confluence and Pine-Belle reach have been identified as being impaired due to exceedances of the Minnesota water quality standard for turbidity. Turbidity is an indicator used by Minnesota to assess whether a water body is attaining the aquatic life designated use. Turbidity is a measure of the degree to which light is scattered or absorbed by the water. Turbidity is not a pollutant. Since TMDLs must be written for a pollutant MPCA selected total suspended solids (TSS) as the pollutant of concern. In Section 2.5 of the TMDL report the State explains that light scatter and adsorption is strongly influenced by the amount of solid materials suspended in the water column thus forming a relationship between TSS and turbidity. Two advantages were provided by the State for expressing the TMDL and allocations as TSS load. The first advantage is that many upstream point sources have TSS effluent limits, concentration (mg/l) and load (kg/day), already in their NPDES permits. Because of this, impacts from these point sources were easily considered in the establishment of the loading capacities and allocations. Use of TSS loads in the WLAs will also aid in the implementation of the WLAs since the allocations are already in terms which permit-holders and permit-writers are familiar with implementing. The second advantage is that sediment delivery and soil erosion are commonly expressed in terms of mass loads. Since nonpoint sources contributing turbidity to the Cannon River are related to upland, streambank, and stream channel soil erosion and sediment delivery processes, expressing the TMDLs in terms that these nonpoint sources, such as agricultural professionals and construction/development industries, are familiar with will aid in the implementation of the TMDLs. Refer to Section 2 of this decision document for further discussion of the linkage made by the State between turbidity and TSS.

Sources of Pollutant Loads:

Potential sources of sediment to the Lower Cannon River include NPDES permit holders, both municipal waste water treatment plants (WWTPs) and industrial facilities, stormwater and various nonpoint sources. In development of the TMDLs the State considered potential sources throughout the Cannon River watershed, not just those sources within the Lower Cannon River watershed. As previously mentioned, the Lower Cannon River watershed is the area downstream of the Byllesby Reservoir. The reservoir is formed by a large hydroelectric dam just west of the City of Cannon Falls. The Byllesby Reservoir impacts both sediment delivery and flow to the Lower Cannon River watershed thus affecting turbidity. The Byllesby Reservoir can trap and retain sediment from the upper watershed thus reducing turbidity just downstream of the reservoir. However under high flow conditions large amounts of sediment can be transported through the Byllesby Reservoir into the Lower Cannon River. Flow into the Lower Cannon River watershed is also impacted by the Byllesby Reservoir. Despite the fact that temporary storage may occur in the Byllesby Reservoir, all water entering the Byllesby Reservoir eventually flows into the Lower Cannon River watershed. The State recognized in the TMDL report that there is uncertainty about the influence of the Byllesby Reservoir on sediment delivery and flow dynamics within the Lower Cannon River watershed. To minimize this

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uncertainty, the State treated turbidity sources upstream of the Byllesby Reservoir the same as those sources downstream.

Appendix C and Section 1.3 of the TMDL report list existing NPDES municipal WWTPs and industrial process water dischargers that are potential point sources. The City of Netstrand and the City of Cannon Falls WWTPs discharge within the Lower Cannon River watershed but upstream of the Pine-Belle reach. The remaining WWTPs and industrial point sources discharge upstream of the Byllesby Reservoir. Appendix C and Section 1.3 include Minnesota Malting of Cannon Falls as a potential point source. This facility is considered a potential source since it still has a valid permit that includes a TSS effluent limit, however the State has indicated in the TMDL report and in an electronic mail message to U.S. EPA² that this facility is no long operating. The current permitted cumulative TSS mass load from WWTP and industrial point sources is approximately 4.7 tons/day. Appendix C provides current permit conditions for facilities which have TSS included in their NPDES permits. According to Section 5 of the TMDL report, if current permit conditions are attained no reductions should be needed at municipal and industrial NPDES permit holders.

The State considered three categories of stormwater point sources; construction, industrial, and municipal. Stormwater runoff from construction sites has been estimated by U.S. EPA to incur a soil loss of 20 to 150 tons per acre per year.³ In Section 1.3 and Appendix C of the TMDL report, the State reports that during the past six years there have been 51 construction permits issued in the Lower Cannon River watershed and 329 in the Cannon River watershed. Sites within the Lower Cannon River watershed range from 1.1 to 117 acres disturbed.

Runoff from rooftops, roads, parking lots and storage and material handling activities at industrial facilities can be sources of industrial stormwater. If an industrial facility falls within an applicable regulatory category the facility must apply for a NPDES stormwater permit or certify a condition of no exposure. NPDES permits will require these facilities to develop and implement a Stormwater Pollution Prevention Plan in which best management practices are designed to eliminate or minimize stormwater contact with significant materials that may result in discharges of polluted stormwater from the industrial site. Section 1.3 and Appendix C identify five (5) facilities within the Lower Cannon River watershed and 51 facilities in the Cannon River watershed with industrial stormwater permits. All of the facilities identified are upstream of the Pine-Belle reach.

Municipal stormwater can also be a source of sediment to the Cannon River. Figure 3, Table 2, and Section 1.3 of the TMDL report state that approximately 3% of the land use in the Lower Cannon River watershed is urban/developed. The City of Red Wing is the only city in the Lower Cannon River watershed required to obtain a permit for municipal stormwater however, the City of Red Wing discharges its municipal stormwater to the Mississippi River rather than the Cannon River. There are four other communities upstream of the Byllesby Reservoir that are potential municipal stormwater sources; Faribault, Northfield, Owatonna, and Waseca. These four communities are required to have Municipal Separate Storm Sewer Systems (MS4) NPDES permits. These MS4 permits require these

² See May 30, 2007 electronic mail message from Lee Ganske, MPCA, to Julianne Socha, U.S. EPA.

³ See December 8, 1999 Federal Register Vol. 64, No. 235

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municipalities to develop and implement Stormwater Pollution Prevention Plans.

Nonpoint sources considered by the State include natural erosion, agriculture, aggregate/mining operations, livestock grazing, unpaved roads, and in-stream sources. The State indicates in Section 1.3, Figure 3, and Table 2 of the TMDL report that approximately 60% of the land use in the Lower Cannon River watershed is agricultural row crops. Lack of vegetative cover for portions of the year and slope length and steepness are factors that contribute to soil loss from this nonpoint source. Figure 5 of the TMDL report depicts locations of actual or potential aggregate sites in the Lower Cannon River watershed. These sites can release sediment through material processing activities however, NPDES permits usually require controls for such releases. According to Section 1.3, Figure 3, and Table 2 of the TMDL report, approximately 18% of the land use in the Lower Cannon River watershed is grassland. A portion of this grassland is used for livestock grazing. Overgrazing of livestock can cause erosion due to a lack of vegetative cover. Natural erosion includes low levels of soil erosion from both stream channels and upland areas. According to Section 1.3 of the TMDL report, unpaved roads can contribute sediment directly from the surface of unpaved roads.

Land Use, Population Characteristics, and other Relevant Information:

Section 1.0 of the TMDL report states that the Cannon River watershed includes approximately 941,000 acres of primarily agricultural landscape. The Cannon River watershed covers portions of eight counties. Because the Cannon River watershed is a relatively large watershed it is often referenced by the following subwatershed lobes: Straight River watershed, Upper Cannon River watershed, Middle Cannon River watershed, and the Lower Cannon River watershed.

Both the Confluence reach and the Pine-Belle reach are located within the Lower Cannon River watershed therefore, the Lower Cannon River watershed is the primary focus of the TMDL report, although, the State considers point and nonpoint sources throughout the entire Cannon River watershed to have an impact on turbidity within both impaired reaches. The Lower Cannon River watershed contains five named and several small unnamed subwatersheds. Table 1, Figure 2, and Appendix F of the TMDL report identify these subwatersheds within the Lower Cannon River watershed. United States Geological Survey (USGS) land cover data suggests that approximately 60% of the Lower Cannon River watershed is agricultural crop land with about 12% upland forest. The remaining 28% is a mix of remaining land uses, such as urban, grassland, and wetland. At the top of the Lower Cannon River watershed lays the Byllesby Reservoir. Section 1.1 of the TMDL report discusses how the Byllesby Reservoir provides a reset point with respect to water quality in the Cannon River. Sediment and other materials that enter the Byllesby Reservoir settle out or are used internally by the system.

Future Growth

The State did not provide specific allocations for future growth however future growth of sources was accounted for in the wasteload allocations. The State considered the current cumulative TSS mass load from existing municipal and industrial point sources to be 4.7 tons/day. The wasteload allocation for municipal and industrial point sources is 7 tons/day. This wasteload allocation was established at 50% above the current cumulative TSS mass load for these facilities. The State did not consider new or expanded discharges to have a significant impact on turbidity in the Lower Cannon River provided

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NPDES permit discharge limits are met. Current discharge limits for municipal and industrial facilities are typically 45-65 mg/l TSS. The State points out in the future growth discussion of the TMDL report that current permitted TSS mass from point sources accounts for only 15-16% of the total TSS loading capacity of the two reaches under low flow conditions, the conditions when such dischargers would have their greatest impact.

The current number of MS4 communities in the Cannon River watershed is expected to increase over the next 20 years, according to Section 2.11 of the TMDL report. Current MS4 communities comprise 3% of the land area of the respective impaired reach watershed areas. The wasteload allocation for MS4 Communities was established assuming the land area of MS4 communities to be 5% rather than the current 3%. Section 2.11 of the TMDL report recognizes that if greater growth of MS4 communities occurs then the load allocations of these TMDLs may need to be adjusted to allow for additional wasteload allocation to the MS4 communities.

No future growth was provided for nonpoint sources.

Priority Ranking:

Minnesota has consistently included turbidity impaired waters on its 303(d) lists. Section 303(d)(1)(A) of the Clean Water Act requires States to establish a priority ranking for the impaired waters, taking into account the severity of the pollution and the designated uses of the impaired waters. The target schedule on Minnesota's 303(d) list reflects the State's priority ranking. In establishing the priority ranking, i.e., the target schedule for developing TMDLs, the State considers factors such as the severity of the pollutant, available monitoring data and targeted monitoring schedule, designated use of the water body, and available resources. Minnesota's 2006 IR targeted the Confluence and Pine-Belle reaches for completed TMDLs by 2009.

Assessment: U.S. EPA finds that the Lower Cannon River turbidity TMDLs submitted by the State of Minnesota adequately describe the water bodies, pollutant of concern, pollutant sources, and priority ranking. The State provided a narrative discussion in the TMDL report linking TSS and turbidity, additionally the state provided implementation advantages associated with the use of the TSS TMDL targets. Further discussion of a quantitative linkage between the turbidity water quality standard and the TSS TMDL targets can be found in Section 2 of this decision document. U.S. EPA finds the State's assumption that the sources upstream of the Byllesby Reservoir contribute sediment to the Lower Cannon River watershed without any influence from the Byllesby Reservoir acceptable. U.S. EPA agrees with the State that the Byllesby Reservoir does influence the sediment delivery and flow dynamics within the Lower Cannon River watershed however, U.S. EPA finds the State's assumption acceptable because it is a conservative approach to minimizing the uncertainty associated with quantifying these influences. U.S. EPA agrees with the State's comment in Section 2.2 of the TMDL report that efforts to reduce or eliminate sources of turbidity should be focused on sources within the Lower Cannon River watershed.

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

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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 CFR §130.7(c)(1)). U.S. 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.

Numeric and Narrative Water Quality Standards:

As previously mentioned in Section 1 of this decision document, the State uses turbidity as an indicator to assess whether a water body is attaining the aquatic life designated use as set forth in Minnesota Rules, 7050.0222, subpart 4. Minnesota Rules state, “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.” Pursuant to Minnesota Rules, 7050.0470, subpart 7, the Cannon River is classified as a Class 2B and 3B water and therefore is subject to a chronic turbidity water quality standard of 25 nephelometric turbidity units (NTUs) as set forth in Minnesota Rules, 7050.0220 and 7050.0222.

Linking Total Suspended Solids to Turbidity Water Quality Standard:

As stated above in Section 1 of the decision document, Minnesota has selected TSS as the numeric water quality target for both the TMDLs. Based upon the results of the regression depicted in Figure 6 of the TMDL report, 44 mg/l is the TSS equivalent of the 25 NTUs water quality standard. The State used USGS Long-Term Resource Monitoring Program data and MPCA water quality data to define the TSS-turbidity relationship. A regression relationship can be influenced by a few values, in this specific case the State indicated that some high turbidity and TSS values may have influenced the regression relationship. So, the State ran a regression relationship using only turbidity values less than 100 NTUs. In this relationship 47 mg/l is the TSS equivalent of the 25 NTUs water quality standard. MPCA’s turbidity guidance currently under development suggests that only NTUs values less than or equal to 40 be used in developing equivalency relationships so the State also ran a regression relationship under this criteria. In this relationship 48 mg/l was the TSS equivalent of the 25 NTUs water quality standard. The State selected 44 mg/l as the TSS equivalent of the 25 NTUS water quality standard for the establishment of these TMDLs.

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Assessment: U.S. EPA finds that the TMDL Report submitted by the State of Minnesota adequately describes its water quality standards, relevant criteria, and water quality target. U.S. EPA agrees that a TSS concentration is an appropriate water quality target for these TMDLs. Minnesota's selection of TSS as a target is linked to the State's numeric and narrative water quality standards as demonstrated in the TMDL report and is a logical target since the mass load of solids is commonly used when considering solids being discharged directly or indirectly through runoff from point and nonpoint sources. U.S. EPA finds the TMDL target of 44 mg/l TSS an acceptable target for both TMDLs. The State selected the more conservative TSS target after consideration of three turbidity and TSS data sets.

3. Loading Capacity - Linking Water Quality and Pollutant Sources

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

General Approach to TMDL Development

The loading capacities for both the Confluence reach and the Pine-Belle reach are expressed in tons/day of TSS. The State used a load duration curve to define the loading capacities. A load duration curve was generated from the integration of USGS flow data at Welch, USGS gage 05355200, and the TMDL TSS target concentration of 44 mg/l. The resulting curve defines the loading capacity, or the TSS pollutant load, at Welch that the Cannon River can carry and still attain the chronic turbidity water quality standard of 25 NTUS. The USGS gage site at Welch is located on the Cannon River, two river miles upstream of the confluence of the Cannon River and Belle Creek. Figure 2 of the TMDL report shows the location of the USGS gage site in relation to the Confluence and Pine-Belle reaches.

The resulting load duration curve defines a range for the loading capacity as a function of flow. At a given flow interval the load duration curve provides the corresponding loading capacity that the Cannon River can carry. Rather than identifying one point on the curve as the loading capacity the

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State divided the curve into five flow zones and identified the mid-point of each zone as the loading capacity for that flow zone. Although the break points for the five zones are fairly arbitrary the zones are consistent with recommendations made by U.S. EPA staff in presentations on load duration curves and the mid-point percentiles of each zone are percentiles commonly used in statistics.

After identifying the loading capacities for each zone the State calculated the difference between the mid-point of each flow zone and the low end of each flow zone. This difference was defined as the margin of safety for the respective flow zone. The remaining capacity, after applying the margin of safety in each zone, was assigned as allocation. The allocation was further divided into load and wasteload allocation. Further discussion on the margin of safety, load allocation and wasteload allocation can be found in other sections of this decision document.

Loading Capacities for the Confluence and Pine-Belle Reaches

As previously mentioned the load duration curve shown in Figure 12 of the TMDL report is the load duration curve for the Cannon River at Welch. Welch is the location of the USGS flow gage as shown on Figure 2 of the TMDL report. The State adjusted the loading capacities, MOS, and allocations for each flow zone at Welch for the contributing drainage area of the Pine-Belle reach and the Confluence reach. The drainage area at Welch is 1340 square miles, while the drainage area is 1345 square miles at the downstream end of the Pine-Belle reach, and 1443 square miles at the confluence with the Vermillion/Mississippi River. The adjustment factor for the Pine-Belle reach was negligible (1345 sq. mi. adjusted to 1340 sq. mi.) while a 1.08 adjustment factor was used for the Confluence reach (1345 sq. mi. adjusted to 1443 sq.mi.). The revised Tables 5 and 6⁴ show the loading capacities in tons/day TSS for each of the five flow zones for the Pine-Belle and the Confluence reach. Table 1 of this decision document also shows the loading capacities for each flow zone for both the Pine-Belle and Confluence reach that are being approved by U.S. EPA.

Critical Conditions

Section 2.10 of the TMDL report identifies high flows as a critical condition for these TMDLs. Figures 14 and 15 of the TMDL report show the daily loads from 10+ years of flow data and nine years of TSS data plotted with the loading capacity curve. Most exceedances of the loading capacity curve occur during mid-range to high flow conditions.

Assessment: U.S. EPA finds that the Lower Cannon River turbidity TMDLs submitted by the State of Minnesota adequately identify the loading capacities and adequately account for critical conditions. Minnesota's use of the load duration curve adequately accounts for the high flow critical condition defined by the State. The load duration curve used to establish the loading capacities took into consideration more than ten years of flow data thereby accounting for a range of flow. The State's adjustment factors used to account for the contributing drainage area is a reasonable approach to establishing loading capacities for each impaired reach from the load duration curve at Welch. Establishing the load duration curve at Welch is reasonable since flow

⁴ MPCA submitted revised Tables 5 and 6 to U.S. EPA in a June 11, 2007 electronic mail message.

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data from a USGS flow gage was available at this location and the gage location is within the same watershed as the impaired reaches and the drainage area for Welch and the impaired reaches is similar in size as demonstrated by the low adjustment factor. Also, the gage is downstream of the Byllesby Reservoir so any impacts on flow from the reservoir should be reflected in the flow data.

4. Wasteload Allocations (WLAs)

U.S. EPA regulations require that a TMDL include wasteload allocations, which identify the portion of the loading capacity allocated to individual existing and future point source(s) (40 CFR §130.2(h), 40 CFR §130.2(i)). In preparing the wasteload allocations, it is not necessary that each individual point source be assigned a portion of the allocation of pollutant loading capacity. When the source is a minor discharger of the pollutant of concern or if the source is contained within an aggregated general permit, an aggregated wasteload allocation can be assigned to the group of dischargers.

The revised Table 6 to the TMDL report and Table 1 of this decision document include the WLAs that are being approved by U.S. EPA. The State established a WLA for WWTPs and industrial facilities operating pursuant to NPDES permits and three categories of NPDES stormwater point sources, i.e., MS4 communities, construction, and industrial. As mentioned in the loading capacity section of this decision document the portion of the loading capacity left after setting aside the margin of safety was assigned as allocations. A portion of this allocation is assigned as WLA for each flow zone for each impaired reach.

The WLA for WWTPs and industrial facilities is 7.0 tons/day TSS for both the Confluence and Pine-Belle reach. This WLA does not vary from flow zone to flow zone or from reach to reach. This wasteload allocation was established by summing the current WWTP and industrial NPDES permit TSS discharge limits then the resulting load was increased by 50% to account for future growth. Individual NPDES permit discharge limits for existing facilities used to establish the WLA are listed in Appendix C of the TMDL report. The TMDL report states that no reductions to existing permit limits, as shown in Appendix C, are anticipated.

The State established a stormwater WLA for each of the three categories of stormwater for each flow zone for each impaired reach. The stormwater WLAs was determined based upon the estimated percentage of land in the impaired reach watersheds affected by the three stormwater source categories. The State estimated that MS4 communities affect 5% of the land area, construction sites affect 1% of the land area, and industrial stormwater sites affect 0.5% of the land area. As previously discussed in this decision document and as stated in Section 2.9 of the TMDL report, these percentages consider potential conditions 20 years into the future. Appendix C of the TMDL report identifies construction and industrial stormwater permits that have been issued over the past six years.

Assessment: U.S. EPA finds that the wasteload allocations are adequately specified in the TMDLs at a level sufficient, when combined with the load allocations, to attain and maintain water quality

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of knowledge concerning the relationship between load and wasteload allocations and water quality (CWA §303(d)(1)(C), 40 CFR §130.7(c)(1)). U.S. EPA's 1991 TMDL Guidance explains that the margin of safety 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 margin of safety. If the margin of safety is implicit, the conservative assumptions in the analysis that account for the margin of safety must be described. If the margin of safety is explicit, the loading set aside for the margin of safety must be identified.

The State considers the loading capacities to vary as a function of flow since the TSS concentration is fixed at 44 mg/l. The State goes on to conclude that since the loading capacities vary as a function of flow then using flow variability as a basis for the MOS is appropriate. The MOS for each flow zone is the difference between the mid-point of the flow zone and the low flow side of each flow zone. According to the TMDL report, establishing the MOS at the low flow side of the flow zone will protect against TSS loading when there is less capacity in the river due to lower flows. The June 11, 2007 revised Table 6 from MPCA and Table 1 of this decision document identify the explicit margin of safety for each flow zone for each impaired reach.

Assessment: U.S. EPA finds that the turbidity TMDLs for the Lower Cannon River submitted by the State of Minnesota provide adequate margin of safety. Variation in stream flow is an uncertainty associated with these TMDLs. The explicit margin of safety calculated for each flow zone provides that the allocations will not exceed the loading capacity associated with the minimum flow in each zone. Use of multiple years of stream flow data also helps to minimize variability associated with stream flow. Although not mentioned by the State as a margin of safety, the State selected the more conservative TSS TMDL target from its regression analysis of the relationship between TSS and turbidity thus providing an implicit margin of safety for any uncertainty associated with the TSS TMDL target.

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 CFR §130.7(c)(1)).

Section 2.4 of the TMDL report states that flow data from 1991 to 2004 was used to estimate the loading capacities and current loads for both the Confluence and Pine-Belle reaches. This 10+ year time period accounts for annual and inter-annual climate-related and water quality variability but also is representative of current watershed conditions.

Assessment: Load duration curves are created by combining flow and pollutant concentration. The pollutant concentration used to create the load duration curve for the Lower Cannon River at Welch is the TMDL target 44 mg/l TSS. This target was established as the TSS pollutant concentration equivalent to the 25 NTUS water quality standard for turbidity. This relationship between TSS and turbidity was derived by consideration of water quality data from 1995 through 2004. Appendix D

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provides the TSS and turbidity data. U.S. EPA reviewed the data presented in Appendix D along with representations of the data in various figures throughout the TMDL report and finds that the data was collected over various months during the ten year time period. Therefore, the pollutant concentration used to develop the load duration curve takes into account seasonal variation. The flow data used to create the load duration curve spans from 1991 to 2004. Use of multi-years of flow data represents inter-annual climate related variability. Section 2.4 of the TMDL report did recognize that 30 years of flow data is usually used to represent climate “normals”. However, the USGS flow gage was inactive for the period 1972 through 1990 therefore flow data for the past 30 years was not available. U.S. EPA find that the State adequately considered seasonal variations in the establishment of the TMDLs for the Lower Cannon River by using water quality data and flow data collected during all seasons over at least a ten year time period.

8. Reasonable Assurances

When a TMDL is developed for waters impaired by point sources only, the issuance of a NPDES permit(s) provides the reasonable assurance that the wasteload allocations contained in the TMDL will be achieved. This is because 40 CFR §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 wasteload allocation is based on an assumption that nonpoint source load reductions will occur, U.S. 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 U.S. EPA to determine that the TMDL, including the load and wasteload allocations, has been established at a level necessary to implement water quality standards.

U.S. 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, U.S. 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.

Table 12 of the TMDL report identifies potential partners and the actions these partners could undertake in order to achieve successful implementation of the TMDLs. Section 6.0 of the TMDL report identifies the various state and local government agencies, academia, citizen groups, and agricultural experts that have been involved in the development of the TMDLs. Section 6.0 also states that MPCA and local entities have active construction, urban and industrial stormwater management programs. Section 6.0 states that local, state, and federal funds are available to pay for conservation easements on sensitive lands and that Clean Water Legacy Act funds appear promising.

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Assessment: As pointed out in one of the public comments received during the public notice and comment, the TMDL report does not identify specific funding sources for implementation efforts. However, the TMDL report does identify the various government agencies and local organizations that have been involved in the development of the TMDLs. The TMDL report also provides information supporting the fact that local organizations have taken an active interest in improving the water quality within the Cannon River watershed. The State has provided no reason for U.S. EPA to believe that these agencies and organizations will not continue to be active throughout implementation efforts. Two of the public comments received specifically offered their resources to help move nonpoint source implementation forward and one comment suggested a specific funding option that could be considered during implementation. The TMDL report clearly states that current NPDES municipal and industrial permits, if complied with, should be sufficient to achieve the applicable wasteload allocations. The State of Minnesota does have an active municipal, industrial and construction stormwater permit program thus providing reasonable assurance that the applicable stormwater wasteload allocations can be achieved. U.S. EPA finds that the Lower Cannon River turbidity TMDLs submitted by the State of Minnesota provide reasonable assurances that the wasteload allocations and load allocations will be achieved.

9. Monitoring Plan to Track TMDL Effectiveness

U.S. EPA's 1991 document, Guidance for Water Quality-Based Decisions: The TMDL Process (U.S. EPA 440/4-91-001) recommends a monitoring plan to track the effectiveness of a TMDL.

Section 5.2 of the TMDL report identifies the need, key requirements and objectives for ongoing monitoring of flow, turbidity, TSS, and transparency to determine the effectiveness of reduction strategies and efforts. The State has identified various partners in the monitoring process including the promotion and expansion of citizen stream monitoring in the Cannon River watershed. The State has also identified the need to coordinate with other agencies and resources to conduct additional research on soil erosion and sediment delivery and to use results from other projects to better define and direct implementation efforts on the Lower Cannon River. The State identified the need to track implementation efforts in order to gauge general progress, develop inputs for future modeling efforts, and extrapolate model results to other areas of the Cannon River watershed. The State also recognized the need to address funding for monitoring as critical.

Assessment: U.S. EPA finds the TMDL report submitted by the State of Minnesota adequately describes recommendations for future monitoring to track the effectiveness of the TMDLs, although U.S. EPA is not approving any recommendations for monitoring contained in this TMDL Report or any other aspect of Minnesota's monitoring program through this decision.

10. Implementation

U.S. EPA policy⁵ encourages Regions to work in partnership with States/Tribes to achieve nonpoint

⁵ Perciasepe, B., U.S. EPA, Office of Water, *New Policies for Establishing and Implementing Total Maximum Daily Loads (TMDLs)*, August 8, 1997.

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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 load allocations established in TMDLs for waters impaired solely or primarily by nonpoint sources will in fact be achieved. In addition, U.S. EPA policy recognizes that other relevant watershed management processes may be used in the TMDL process. U.S. EPA is not required to and does not approve TMDL implementation plans.

Minnesota states in Section 5.1 of the TMDL report that “Within one year of approval of this TMDL by EPA, an expanded and more detailed implementation plan will be developed.” Section 5.1 of the TMDL report includes some brief discussion of implementation activities related to erosion control from nonpoint sources. Specific implementation activities and how implementation will be targeted will be included in the implementation plan. Minnesota’s implementation section also discusses urban stormwater management. Currently there are no cities that discharge to the Cannon River in the Lower Cannon River watershed that are required to obtain an MS4 permit for stormwater. Despite the fact that no MS4 permits are currently required communities will be encouraged to implement BMPs with measurable goals and to conduct effective monitoring. Minnesota also states that education efforts will be conducted to inform residents about stormwater pollution. Upstream in the Cannon River watershed four cities will be required to apply for MS4 permits. Minnesota recognizes that “active enforcement” and “vigorous application” of the Storm Water Pollution Prevention Plans required in the MS4 permits will be critical. Section 5.1 states that no reductions are anticipated at current permitted municipal and industrial NPDES permit holders.

Section 3 of the TMDL report also provides some information about the State’s understanding of the turbidity problem in the Lower Cannon River watershed and the direction of implementation efforts. Section 3 provides information about the current TSS loads, needed reductions, some comparison of annual loads from 2000 to 2004, and discussions the relationships observed between sources, TSS loads, and flow.

Assessment: U.S. EPA is taking no action on the implementation discussions within the TMDL Report but notes that the State appears to have good basis for the development of a more detailed implementation plan.

11. Public Participation

U.S. 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 CFR §130.7(c)(1)(ii)). In guidance, U.S. EPA has explained that final TMDLs submitted to U.S. 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.

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

Public participation in the development of the TMDLs formally began at the first Steering Committee meeting on June 6, 2003 however, interested citizens have been monitoring within the Cannon River watershed since 1999. The development of the TMDLs was a combined effort between local groups, county agencies, other state agencies besides MPCA, and MPCA. A steering committee was formed in 2003 and a technical committee began meeting in 2005. The steering committee functioned in an advisory and oversight role. The technical committee was comprised of members primarily responsible for modeling and calculation of loads and allocations. Table 11 of the TMDL report provides dates of steering and technical committee meetings along with the agencies or entities represented at these meetings.

MPCA released a fact sheet in October 2006 entitled “Lower Cannon River Total Maximum Daily Load for Turbidity”. The fact included information about the TMDL process, the turbidity problem in the Cannon River, information about assessment and implementation, and announced a public meeting on October 26, 2006. MPCA also issued a Notice of Availability and a News Release on November 6, 2006 announcing the draft TMDLs for the Lower Cannon River and a request for comments. The public notice period ran from November 6 to December 6, 2006. Appendix H of the TMDL report includes copies of both the Notice of Availability and the News Release. Additionally, Appendix H includes a copy of the mailing list to which MPCA distributed this information.

Appendix G of the TMDL report includes copies of the comments received by MPCA and MPCA’s responses. MPCA received five comment letters. MPCA responded individually to each comment letter. Copies of MPCA’s responses were also included in Appendix G. Many of the comments received involved implementation topics. MPCA responded favorably to suggestions for engaging stakeholders, especially the agricultural community, in the development of the implementation plan, utilizing resources, both financial and technical, to further define and support the necessary implementation efforts and consideration of new information as it becomes available to direct implementation efforts. Some commentors suggested specific revisions or changes to figures and text in the TMDL report. MPCA made changes to Figure 2, Figure 5 and associated text, Section 5.2, and Section 6. Some other discussions throughout the TMDL report regarding nonpoint sources and implementation related to nonpoint sources has been edited in response to public comments received.

The Cannon River Watershed Partnership (CRWP) took an active role in the public participation efforts associated with the development and the finalization of these TMDLs. Section 4 and Appendix E of the TMDL report provide information on CRWP’s involvement regarding outreach and public education for these TMDLs. CRWP was involved in both the steering and technical committees. CRWP provided displays about the TMDL process at a local festival in August 2005

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and at a public meeting held on August 17, 2005 in Red Wing, Minnesota. CRWP provided notice of the August 2005 public meeting to CRWP members through electronic mailings. News releases in the Cannon Falls and Red Wing newspapers and flyers at public locations within the affected townships provided notice of the public meeting to the local public. CRWP also provided the public the opportunity to review and discuss a preliminary draft of the TMDL report at a public meeting on June 14, 2006.

Assessment: U.S. EPA finds that the State of Minnesota's public participation process satisfies the requirement that calculations to establish TMDLs shall be subject to public review in accordance with State procedures thus satisfying the requirement at 40 CFR §130.7(c)(1)(ii). The State provided an adequate opportunity for the public to be involved not only in the review and comment of the draft TMDLs but in the development of the TMDLs. The State responded to all the comments received during the public notice and comment period and encouraged the commentors to become involved in the implementation process once the TMDLs are approved. The information provided in the TMDL report indicates that the State has a working relationship with CRWP thus allowing for additional public participation in the development of the TMDL through the outreach and education efforts of CRWP.

12. Submittal Letter

A submittal letter should be included with the TMDL, and should specify whether the TMDL is being submitted for a technical review or final review and approval. Each final TMDL submitted to U.S. 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 U.S. EPA review and approval. This clearly establishes the State's/Tribe's intent to submit, and U.S. 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.

Assessment: MPCA's May 10, 2007 correspondence signed by Brad Moore, Commissioner, addressed to Jo Lynn Traub, Director, U.S. EPA, Region 5, Water Division, states that the Lower Cannon River Watershed TMDL study for turbidity and supporting documentation and information are submitted under Section 303(d) of the Clean Water Act for U.S. EPA final review and approval. MPCA's response to U.S. EPA comments provided in a May 30, 2007 electronic mail message, MPCA's revised Table 6 to the TMDL report submitted to U.S. EPA on June 11, 2007, and MPCA's confirmation of wasteload allocations in its June 26, 2007 electronic mail message provided the necessary information to complete U.S. EPA's review and approval of the May 10 final TMDL submittal.