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

DEC 0 3 2013

REPLY TO THE ATTENTION OF:

WW-16J

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DEC 0 9 2013

MPCA COMMISSIONERS OFFICE

Rebecca J. Flood, Assistant Commissioner
Regional Environmental Management Division
Minnesota Pollution Control Agency
520 Lafayette Road North
St. Paul, Minnesota 55155-4194

Dear Ms. Flood:

The U.S. Environmental Protection Agency has conducted a complete review of the final Total Maximum Daily Loads (TMDLs) for two segments of Buffalo Creek (ID#07010205-501 and #07010205-502) in south central Minnesota, including supporting documentation and follow up information. Buffalo Creek flows eastward into the South Fork of the Crow River which then flows into the Mississippi River. The TMDL was calculated for *E. coli* to address the bacteria impairment. The designated use impairment in the creek is aquatic recreational use. Buffalo Creek is classified as a Class 2B water and is defined as and protected for aquatic life (warm and cool water fisheries and associated biota) and recreation (all water recreation activities including bathing).

This TMDL 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 Minnesota's two TMDLs for *E. coli*. The statutory and regulatory requirements, and EPA's review of Minnesota's compliance with each requirement, are described in the enclosed decision document. We wish to acknowledge Minnesota's effort in submitting these TMDLs, and look forward to future TMDL submissions by the State of Minnesota. If you have any questions, please contact Mr. Peter Swenson, Chief of the Watersheds and Wetlands Branch, at 312-886-0236.

Sincerely,

for Tinka G. Hyde
Director, Water Division

Enclosure

cc: Jeff Risberg, MPCA
Greg Van Eeckhout, MPCA

TMDL: Buffalo Creek, Minnesota
Date: November 2013

DECISION DOCUMENT FOR THE APPROVAL OF BUFFALO CREEK, MINNESOTA, TMDL

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

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

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

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

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

(1) the spatial extent of the watershed in which the impaired waterbody is located;
(2) the assumed distribution of land use in the watershed (e.g., urban, forested, agriculture);
(3) population characteristics, wildlife resources, and other relevant information affecting the characterization of the pollutant of concern and its allocation to sources;

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

Comment:

Location Description/Spatial Extent: The Buffalo Creek TMDL is submitted by the Minnesota Pollution Control Agency (MPCA). The Buffalo Creek watershed is approximately 266,453 acres in area; it is mostly channelized in Renville County. Buffalo Creek is located in the South Fork Crow River Watershed and flows eastward to the South Fork Crow River. The Crow River is one of the major tributaries to the Mississippi River and is comprised of the South Fork and North Fork, and drains 1.76 million acres in south-central Minnesota. The Crow River confluence with the Mississippi River is near Dayton, Minnesota, and is in all or parts of Kandiyohi, Meeker, Renville, McLeod, Carver, Sibley, Wright, and Hennepin Counties. Overall the Crow River flows in an easterly direction before joining the Mississippi River, and is a major contributor to the Mississippi River both hydrologically and in nutrient loading. This submittal is for two TMDLs for *E. coli* addressing the bacteria impairment.

The impaired segments addressed in this TMDL are Buffalo Creek from the headwaters to JD-15 Assessment Unit (AU) ID 07010205-502, and Buffalo Creek from JD-15 to its confluence with the South Fork Crow River AUID 07010205-501. The Buffalo Creek watershed lies within the Western Corn Belt ecoregion, with flat to gently rolling topography. There are six cities in the watershed, Glencoe, Brownton, Stewart, Buffalo Lake, Hector, and Dayton.

Land Use: Land use is primarily agricultural at 84%; the remaining land use is 8% developed, 3% wetlands, 2% forests, 2% lakes, and 1% is grassland/pasture.

Problem Identification: Section 1.3 of the final TMDL states that both segments of Buffalo Creek are classified as Class 2B waters and are impaired due to bacteria exceedances. The aquatic life and recreation designated use is impaired by the excess bacteria in the water. Bacteria exceedances can negatively impact recreational uses (fishing, swimming, wading, boating etc.) and public health. At elevated levels, bacteria may cause illness within humans who have contact with or ingest bacteria laden water. Recreation-based contact can lead to ear, nose, and throat infections, and stomach illness. Of the seven months that the measurements are taken from April through October each year in the recreational season, the *E. coli* monthly geomean standard is exceeded in the last five of the seven months.

Pollutant of Concern: *E. coli* bacteria is the pollutant of concern. In high flow conditions the bacteria delivery mechanism to surface waters within the Buffalo Creek watershed is primarily runoff related. In dry conditions the bacteria delivery mechanism to surface waters in the watershed is via direct discharges from septic systems or straight pipes. Overall, the developed land use is only about 8%. The sources are both point and nonpoint and are discussed below.

Source Identification: Livestock are the largest contributor of bacterial contamination in the watershed. Section 5.3 of the final TMDL discusses the various sources:

- Feedlots and overgrazing of pastures near streams - There are 257 registered feedlots (Concentrated Animal Feeding Operations (CAFOs) and registered feedlots) in the Buffalo Creek watershed, housing 50,336 animal units. The animals units are swine, dairy, beef, poultry, and other. Feedlots within 300 feet of a stream are considered to be the most likely to deliver bacteria to the stream due to animal access. There are potentially 26 feedlots with 3,890 animal units that are within this proximity to the stream, and four more with 295 animal units within 100 feet. Overgrazing near streams and pasturelands contribute the most contamination.
- Manure application - There is overland runoff of manure application. Manure may be in solid or liquid form. Application is typically in the fall when waste pits are full, but may also occur earlier in the year as needed.
- Industrial facilities – There are two active locations that are point sources (Minnesota Energy and Seneca Food Corporation), but their discharges are below the standard, and process materials from these facilities do not include bacteria discharges.
- Septic Systems - MPCA estimates a 44% failure rate of septic systems; some counties may have as high as a 65% failure rate. For the purposes of the TMDL calculations, a 55% failure rate was used. "Straight pipe" discharges from septics into the streams are illegal but are suspected to be a large contributor of bacteria, especially when high counts at low flow are observed. Septic systems with illegal straight pipe connection to tiling or stormwater drainage systems within the Buffalo Creek watershed are likely, but their contribution of bacteria is unknown. The WLA is zero because the discharge is illegal.
- Wastewater Treatment Plants (WWTPs) – The WWTPs are Glencoe, Brownton, Hector, Buffalo Lake, Stewart; they typically discharge below their permit limits for *E. coli*. Glencoe, Brownton, and Stewart WWTP have occasionally exceeded their permit limits for *E. coli* but effluent violations are rare (less than 6% of total months monitored) and there have been no violations since 2005.
- Wildlife – Includes calculation of input from deer, geese, and dogs and cats in both rural and urban areas. Calculation was completed with approximate animal densities.
- Urban stormwater runoff – Only a small percentage (8.4%) of the watershed is considered to be urbanized. The urban bacteria contributions are from dogs and cats. Other potential bacteria loading from urban locations is from MS4 contributions, but in this watershed only the City of Glencoe is an MS4.

Priority Ranking: This TMDL has a relatively high priority, which is reflected in the TMDL having been completed. There is considerable interest and communication in the watershed with the Crow River Organization of Waters (CROW) and the County Soil and Water Conservation Districts (SWCDs) of the local counties where the project is located; they are among the many interested stakeholder groups. CROW collected bacteria grab samples during the recreational season from 2001 through 2009, and these samples were used for the development of this TMDL.

Future Growth: Section 4.2.3 of the final TMDL states that to account for a small amount of anticipated future activity and growth in the watershed, the future construction permits were allocated 1%, even though construction activity is expected at <0.1% of the total allocation. There are currently no industrial stormwater permits in the watershed, but allocations were set at 0.5%.

EPA finds that the TMDL document submitted by MPCA satisfies all requirements concerning 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 waterbody, the applicable numeric or narrative water quality criterion, and the antidegradation policy. (40 C.F.R. §130.7(c)(1)). EPA needs this information to review the loading capacity determination, and load and wasteload allocations, which are required by regulation.

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

Comment:
Designated Uses: Section 1.3 of the final TMDL states that the impaired reaches in the Buffalo Creek watershed addressed by these bacteria TMDLs have the use classifications 2B, 3B, 4A, 5 and 6 below (Minn. Rules Ch. 7050.0470).

1. Domestic consumption
2. Aquatic life and recreation
3. Industrial consumption
4. Agriculture and wildlife
5. Aesthetic enjoyment and navigation
6. Other uses
7. Limited resources value

For Class 2 waters, the use is stated as: "Aquatic life includes all waters of the state which do or may support fish, other aquatic life, bathing, boating, or other recreational purposes, and where quality control is or may be necessary to protect aquatic or terrestrial life or their habitats, or the public health, safety, or welfare."

Standards: The most protective bacteria water quality standard is the *E. coli* standard contained in Minn. Rules Ch. 7050.0222 for the Class 2B waters designated use, and is used in the development of this TMDL. *E. coli* concentrations are not to exceed 126 organisms per 100 milliliters (mL) as a geometric mean of not less than five samples representative of conditions within any calendar month, nor shall more than ten percent of all samples taken during any calendar month individually exceed 1,260 organisms per 100 milliliters. The standard applies only between April 1 and October 31. The target for developing this TMDL is the *E. coli* water quality standard; MPCA used the geomean standard for the final TMDL allocations.

Fecal coliform was the contaminant in the original 303(d) listing . In 2008, standards were changed to the *E. coli* indicator. Older measurements (collected before 2006) used fecal coliform as the bacteria indicator, and fecal coliform standards were also exceeded. In those cases, translators were used to convert old data into appropriate measures of *E. coli*.

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

3. Loading Capacity - Linking Water Quality and Pollutant Sources

A TMDL must identify the loading capacity of a waterbody for the applicable pollutant. EPA regulations define loading capacity as the greatest amount of a pollutant that a water can receive without violating water quality standards (40 C.F.R. §130.2(f)).
The pollutant loadings may be expressed as either mass-per-time, toxicity or other appropriate measure (40 C.F.R. §130.2(i)). If the TMDL is expressed in terms other than a daily load, e.g., an annual load, the submittal should explain why it is appropriate to express the TMDL in the unit of measurement chosen. The TMDL submittal should describe the method used to establish the cause-and-effect relationship between the numeric target and the identified pollutant sources. In many instances, this method will be a water quality model.

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

TMDLs must take into account *critical conditions* for 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:
TMDL = Loading Capacity (LC) = WLA + LA + MOS

The loading capacity is shown in the tables below for each of the two segments by flow regime. Ten year average daily flow records were used to develop the flow duration curve/flow zones.

Table 4-2: Buffalo Creek (07010205-501) bacteria TMDL load allocations for each flow zone

Buffalo Creek 07010205-501		Flow Zones				
		Very High	High	Mid-Range	Low	Dry
		E. coli Load (billions of organisms/day)				
Total Daily Loading Capacity		3301.94	963.38	180.97	25.38	7.51
Margin of Safety (MOS)		330.19	96.34	18.10	2.54	0.75
Wasteload Allocations	Permitted Point Source Dischargers+	28.79	28.79	28.79	*	*
	MS4 Communities	85.52	24.95	4.69	0.66	0.19
	Construction Stormwater	33.02	9.63	1.81	0.25	0.08
	Industrial Stormwater	16.51	4.82	0.90	0.13	0.04
Load Allocation	Nonpoint source	2807.91	798.85	126.68	21.80	6.45
Value expressed as percentage of total daily loading capacity						
Total Daily Loading Capacity		100.0%	100.0%	100.0%	100.0%	100.0%
Margin of Safety (MOS)		10.0%	10.0%	10.0%	10.0%	10.0%
Wasteload Allocation	Permitted Point Source Dischargers+	0.9%	3.0%	15.9%	*	*
	MS4 Communities (Glencoe)	2.6%	2.6%	2.6%	2.6%	2.6%
	Construction Stormwater	1.0%	1.0%	1.0%	1.0%	1.0%
	Industrial Stormwater	0.5%	0.5%	0.5%	0.5%	0.5%
Load Allocation	Nonpoint source	85.0%	82.9%	70.0%	85.9%	85.9%

*Note - Monthly permitted point source effluent *E. coli* concentrations under this TMDL are not to exceed 126 organisms/100 mL. Permitted point source allocation values were calculated but not factored in to these allocations since facilities do not operate at their permitted design flow under these flow conditions. Instead, point source discharge allocations for the low and dry flow zones are represented by the following equation: Allocation = (flow contribution from source) multiplied by (126 organisms/100 mL).
+ WWTFs

Table 4-3: Buffalo Creek (07010205-502) bacteria TMDL load allocations for each flow zone

Buffalo Creek 07010205-502		Flow Zones				
		Very High	High	Mid-Range	Low	Dry
		E. coli Load (billions of organisms/day)				
Total Daily Loading Capacity		508.10	233.61	53.95	12.43	5.31
Margin of Safety (MOS)		50.81	23.36	5.39	1.24	0.53
Wasteload Allocations	Permitted Point Source Dischargers+	0.00*	0.00*	0.00*	0.00*	0.00*
	MS4 Communities	0.00	0.00	0.00	0.00	0.00
	Construction Stormwater	5.08	2.34	0.54	0.12	0.05
	Industrial Stormwater	2.54	1.17	0.27	0.06	0.03
Load Allocation	Nonpoint source	449.67	206.75	47.74	11.00	4.70
Value expressed as percentage of total daily loading capacity						
Total Daily Loading Capacity		100.0%	100.0%	100.0%	100.0%	100.0%
Margin of Safety (MOS)		10.0%	10.0%	10.0%	10.0%	10.0%
Wasteload Allocation	Permitted Point Source Dischargers+	0.0%*	0.0%*	0.0%*	0.0%*	0.0%*
	MS4 Communities (Glencoe)	0.0%	0.0%	0.0%	0.0%	0.0%
	Construction Stormwater	1.0%	1.0%	1.0%	1.0%	1.0%
	Industrial Stormwater	0.5%	0.5%	0.5%	0.5%	0.5%
Load Allocation	Nonpoint source	88.5%	88.5%	88.5%	88.5%	88.5%

*Note – There are currently no permitted point source dischargers located within the watershed for this listed reach. If point source(s) are established, their monthly geomean effluent *E. coli* concentrations shall not exceed 126 organisms/100mL under this TMDL. Future permitted point source discharge allocations will be represented by the following equation: Allocation = (flow contribution from source) multiplied by (126 organisms/100 mL).
+ WWTFs

Table 3-5 below from the final TMDL shows the percentage reduction needed in each of the two impaired segments by month to achieve the monthly geomean (chronic) *E. coli* standard. MPCA developed the TMDL based on this standard. Note no reductions are needed in April and May.

Table 3-5 Estimate of Percent Reduction Needed to Reach Chronic *E coli* Standard, by Month and Reach

Reach	% Reduction Needed						
	April	May	June	July	Aug	Sept	Oct
Headwaters to JD-15	None	None	57%	None	61%	49%	40%
JD-15 to South Fork confluence	None	None	72%	61%	76%	77%	41%

Method for cause and effect: Section 4.2.1 of the final TMDL reviews the load duration curve (LDC) methodology that was used in this TMDL.

Municipal Wastewater Treatment Facilities: Of the point sources, municipal wastewater treatment facilities have the most significant impact in the watershed. MS4s, general construction stormwater, and general industrial stormwater permits have small proportions of the loads, at 2.6%, 1%, and 0.5%, respectively.

1. Bacteria grab samples were collected by CROW from 2001 – 2009 at four sampling sites (Glencoe, CSAH24, JD-15, and Brownton) within the Buffalo Creek watershed. Daily Discharge Monitoring Reports (DMRs) from facility discharges were downloaded and recalculated from fecal coliform to *E. coli* equivalents.
2. The flow monitoring data included a continuous 10-year interval of average daily flows for each reach. The Rockford station on the mainstem of the Crow River downstream from the confluence of the North and South Fork branches has the most complete flow record in the Crow River watershed. Where data were missing in other streams, gaps were filled with data from other reaches. The most correlative reaches were determined using regression analysis. The correlation was very good at many of the sites; R^2 values ranged from 0.86 to 0.96. An example is shown below in Figure 3-5 taken directly from the TMDL submittal.

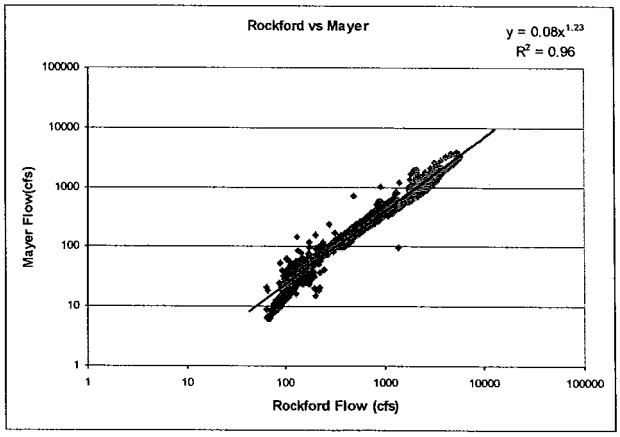

Figure 3-5 Average daily flow regression between the Rockford (lower Crow River) and Mayer (South Fork Crow) monitoring stations

3. The values were sorted by volume and a flow duration curve was developed, as shown in Figure 4-1 below taken from the final TMDL submittal. From flow and water quality data, fecal coliform loads were calculated for five flow regimes under high flow, moist, mid-range, dry, and low flow conditions. Figure 5-1 below shows the flow and water quality data, and where exceedences of *E. coli* occur above the standard at all flow regimes except the "very high". The mid-range flow value for each flow regime was used to calculate the total monthly loading capacity, using continuous flow data converted to monthly mean flow for the recreational season and the *E. coli* standard from April through October.

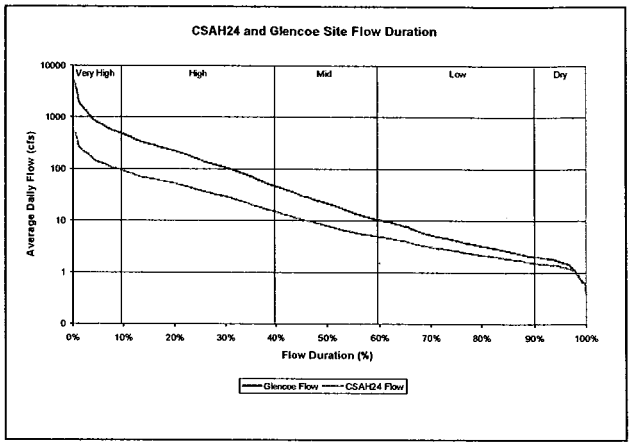

Figure 4-1 Flow duration curves for the Glencoe and CSAH24 monitoring stations. These curves were developed based on continuous average daily flow records over the 2000-2009 period.

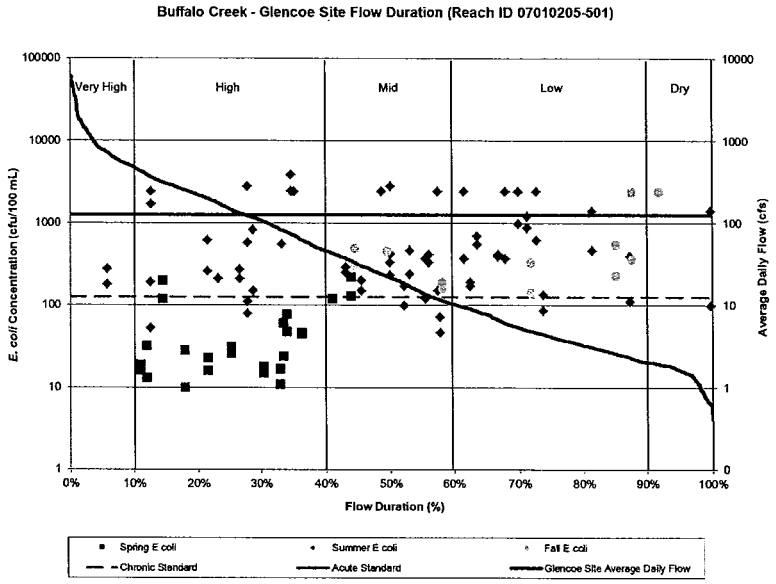

Figure 5-1 Reach 501 *E. coli* concentration by season and flow regime. Flow frequencies were developed using average daily flows from 2000 – 2009 from the Glencoe monitoring station. Bacteria data from the Brownton and Glencoe stations were combined and plotted as one dataset.

MS4s: Section 4.2.2 of the final TMDL describes the methodology for calculating the MS4 allocation for the City of Glencoe (Reach 501). Glencoe's MS4 allocation was calculated using the following equation for urban runoff (MPCA, 2008):

Q = C * i * A

(Q) = peak runoff rate (in cfs)
(C) = runoff coefficient X
(i) = rainfall (inches per hour)
(A) = urbanized area (acres)

Critical Conditions: Section 5.1 of the final TMDL states that the critical conditions for exceedances of the standard occur at both high and low flow conditions. The TMDL takes this wide range of flow into account when calculating the allocations. Data for all stations show elevated concentrations during low flow conditions. At some locations almost all samples collected during low flow regimes showed exceedances of the standard, suggesting concentrations are driven by sources such as septic systems, livestock with direct access to streams, wastewater treatment system discharges and/or wildlife. High flow regimes also contribute to exceedences during summer high-flow conditions due to precipitation events, causing surface runoff.

EPA finds MPCA's approach for calculating the LC to be reasonable and consistent with EPA guidance. EPA finds that the TMDL document submitted by MPCA satisfies all requirements concerning 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 nonpoint sources and to natural background. Load allocations may range from reasonably accurate estimates to gross allotments (40 C.F.R. §130.2(g)). Where possible, load allocations should be described separately for natural background and nonpoint sources.

Comment:
Load allocation: Allocations for nonpoint sources are shown above in Section 3 of this decision document in Tables 4-2 and 4-3. The load allocation is the remaining load after the WLA and MOS are subtracted from the loading capacity.

EPA finds MPCA's approach for calculating the LA in the Buffalo Creek bacteria TMDLs to be reasonable and consistent with EPA guidance. EPA finds that the TMDL document submitted by MPCA satisfies all requirements concerning 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 permitees should be notified of any deviations from the initial individual WLAs contained in the TMDL. EPA does not require the establishment of a new TMDL to reflect these revised allocations as long as the total WLA, as expressed in the TMDL, remains the same or decreases, and there is no reallocation between the total WLA and the total LA.

Comment:

Wasteload Allocation (WLA):

- NPDES WWTF WLA are shown in Table 4-1 below. Daily allocations by flow regime are shown in the Loading Capacity, as shown in Section 3 above.
- Straight pipe septic systems are illegal unpermitted discharges and are allocated zero wasteload.

Table 4-1 Description of industrial and municipal wastewater treatment facilities in the Buffalo Creek watershed and allocated loadings for Reach 501.

Facility Name	NPDES ID#	Facility Type	Receiving Water	Design Flow (MGD)	Allocated Load (billions organisms/day)
Glencoe WWTF	MN0022233	Continuous	Main-stem Buffalo Cr	2.60	12.40
Brownton WWTF	MN0022951	Continuous	Main-stem Buffalo Cr	0.20	0.94
Stewart WWTF	MNG580077	3-cell pond	Main-stem Buffalo Cr	0.84	4.01
Buffalo Lake WWTF	MN0050211	3-cell pond	JD-15	1.74	8.30
Hector WWTF	MN0025445	Continuous	JD-15	0.66	3.15
*Seneca Foods Corp	MN0001236	Controlled pond discharge (SD2)	Unnamed ditch to Buffalo Cr	*5.00	NA
*Seneca Foods Corp	MN001236	Continuous but seasonal (SD1)	Unnamed ditch to Buffalo Cr	*0.40	NA
*Minnesota Energy	MN0063151	Detention pond	JD-15	*0.12	NA
Permitted WWTF Totals				**6.04**	**28.79**

*Effluent from the Seneca Foods and Minnesota Energy Industrial facilities are not believed to contain the pollutant of concern and are not included in the TMDL wasteload allocation calculations.

EPA finds MPCA's approach for calculating the WLA in the Buffalo Creek bacteria TMDLs to be reasonable and consistent with EPA guidance. EPA finds that the TMDL document submitted by MPCA satisfies all requirements concerning this fifth element.

6. Margin of Safety (MOS)

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

Comment:
The load allocation tables in Section 4.4 of the final TMDL indicate that a 10% explicit margin of safety (MOS) was used. This value allows for the changes in loading in proportion to the allocation for each flow regime in the TMDL. EPA concurs with the validity of this MOS because the datasets were robust and correlation amongst stream flows was very good. Statistical correlation of flow amongst monitoring stations using regression analyses are used to fill data gaps with a very good level of confidence. R^2 values range from 0.86 to 0.96 as described in Section 3.4 of the TMDL.

EPA finds that the TMDL document submitted by MPCA contains an appropriate MOS satisfying all requirements concerning this sixth element.

7. Seasonal Variation

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

Comment:
Seasonal variation was considered in this TMDL as described in Section 5.1 of the final TMDL. There are five distinct flow regimes that were used for the development of the allocations, from near drought to near flood conditions. In Figure 5-1 above, the squares in the higher flow regimes are the spring observations which show that values fall mostly below the chronic standard dashed line, indicating that water quality measurements collected in the spring meet the standard. In contrast, the remaining points (diamonds and circles) show that the non-spring observation in summer and fall (June through October) are often exceeding both the chronic standard shown as the dashed line and the acute standard shown as the solid line.

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

8. Reasonable Assurances

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

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

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

Comment:
Section 7.1 of the final TMDL states several methods for reasonable assurance that *E. coli* will be reduced in the watershed. They include the following funding sources:

- Federal Section 319 Grants for watershed improvements;
- Funds ear-marked to support TMDL implementation from the Clean Water, Land, and Legacy constitutional amendment, approved by the state's citizens in November 2008;
- Local government cost-share funds;
- Buffalo Creek Watershed District cost-share funds;
- Soil and Water Conservation Districts cost-share funds; and,
- Natural Resources Conservation Service (NRCS) cost-share funds.

In addition, other actions beyond funding mechanisms for improvements in the watershed may be taken in several of the watershed programs:

- Phase II stormwater permit for the City of Glencoe; and,
- Development and implementation of a Stormwater Pollution Prevention Plan (SWPPP). If the SWPPP is not meeting the applicable requirements, schedules and objectives of the TMDL, it must be modified within 18 months after the TMDL is approved.

Section 7.3 of the final TMDL discusses local management of the watershed. The involvement is high from several stakeholder groups. Such involvement is critical to setting and achieving goals in the watershed through planning and implementation:

- CROW has been very active in the watershed since 1999, and the group hopes to address more impairments with greater communication across the watershed. CROW began working with MPCA's Major Watershed Restoration & Protection Project (MWRPP), which is an approach for monitoring multiple contaminants in the multi-county project area; communication is anticipated to improve by better informing stakeholders, engaging volunteers, and coordinating local/state/federal monitoring efforts. A WMP will also be created as a result of this project;
- County-wide comprehensive watershed plans are being developed;
- Section 7.3.3 of the final TMDL discusses the SWCD measures to conserve the soil and water resources. Section 7.3.2 of the final TMDL states that Kandiyohi, Renville, Sibley, McLeod, and Carver Counties each have county water plans with goals for water and land resource management initiatives; cooperation will occur amongst each SWCD, County Water Planners, the Buffalo Creek Watershed District, and the MPCA;
- The Buffalo Creek Watershed District has had an Overall Plan since 1974 in accordance with Minnesota statutes, and provides cost-share and cash incentives for filtering inlets and septic upgrades.

Clean Water Legacy Act (CWLA): The CWLA is a statute passed in Minnesota in 2006 for the purposes of protecting, restoring, and preserving Minnesota water. The CWLA provides the process to be used in Minnesota to develop TMDL implementation plans, which detail the restoration activities needed to achieve the allocations in the TMDL. The TMDL implementation plans are required by the State to obtain funding from the Clean Water Fund. The Act discusses how MPCA and the involved public agencies and private entities will coordinate efforts regarding land use, land management, water management, etc. Cooperation is also expected between agencies and other entities regarding planning efforts, and various local authorities and responsibilities. This would also include informal and formal agreements and to jointly utilize technical educational, and financial resources. MPCA expects the implementation plans to be developed within a year of TMDL approval.

The CWLA also provides details on public and stakeholder participation, and how the funding will be used. The implementation plans are required to contain ranges of cost estimates for both point and nonpoint source load reductions, as well as monitoring efforts to determine effectiveness. MPCA has developed guidance on what is required in the implementation plans (Implementation Plan Review Combined Checklist and Comment, MPCA), which includes cost estimates, general timelines for implementation, and interim milestones and measures. The Minnesota Board of Soil and Water Resources administers the Clean Water Fund as well, and has developed a detailed grants policy explaining what is required to be eligible to receive Clean Water Fund money (FY '11 Clean Water Fund Competitive Grants Policy; Minnesota Board of Soil and Water Resources, 2011)

EPA finds that this criterion has been adequately addressed.

9. Monitoring Plan to Track TMDL Effectiveness

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

Comment:
Section 7.4 of the final TMDL states that monitoring will include tracking the implementation of Best Management Practices (BMPs), and the physical and chemical parameters in water on a ten year cycle. The monitoring will be done by CROW in the South Fork Crow River Watershed using MPCA's MWRPP process. The process includes all impairments being addressed at the same time, and will determine the overall health of the water resources, identify impaired waters and those waters in need of additional protection to prevent impairments. The North Fork Crow River Watershed started this approach in 2010.

EPA finds that this criterion has been adequately addressed.

10. Implementation

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

Comment:
The implementation discussion is in Section 8 of the final TMDL.

- Manure management – Feedlot rules in Minnesota (Minn. R. ch. 7020, which applies to both AFOs and CAFOs) now require manure management, including record keeping and application risk assessment. The BMPs are designed to reduce delivery to surface waters by: incorporation of manure into topsoil; reduction of winter spreading; pathogen removal through several methods (composting, anaerobic storage, ultraviolet radiation, chemical treatment); elimination of spreading in sensitive areas or open inlets; and, erosion control via conservation tillage.

- Pasture management – voluntary implementation measures of nonpoint source runoff include: livestock exclusion from waters using setbacks and fencing; alternative watering systems; rotational grazing; and, buffer strips between grazing and water bodies.
- Feedlot runoff controls – For feedlots smaller than 300 animal units that do not require permits, Minnesota established the Open Lot Agreement (OLA) in 2000 in Minn. R. 7053.0305. OLA allows for operators to apply for cost sharing of controls and then be eligible to receive a conditional waiver from enforcement penalties if they sign up. Controls include: changes in fencing; elimination of open tile intakes; adding/maintaining buffers; installation of clean water diversions and rain gutters; management of feed storage, watering devices, and runoff; exploration of possible runoff containment or irrigation into cropland; consideration of vegetated infiltration and sunny day release to vegetated area; reduction of manure accumulation; and, installation of roofs.
- SSTs – Though the percentage of problems from these systems is small compared to the total, the counties will continue to address systems that are out of compliance with ordinances. The locations will be prioritized based on proximity to streams, direct discharge to surface water, and posing an imminent threat to public health.
- Stormwater management – Urban contributions that are from both domestic and wild animals will be addressed through BMPs such as infiltration basins, bioretention structures, and pet waste ordinances.

EPA reviews, but does not approve, implementation plans. EPA finds that this criterion has been adequately addressed.

11. Public Participation

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

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

Comment:
Public outreach activities are detailed in the TMDL submittal and began long before the draft TMDL. There were several stakeholder meetings in 2008 and 2009, which included the public and the technical advisory committee. The TMDL was public noticed from June 13, 2011 to

August 15, 2011. This timeframe required an extension due to the state government shutdown during part of the initial comment period from July 1, 2011 through July 20, 2011. Copies of the draft TMDL were made available upon request and on the Internet web site: http://www.pca.state.mn.us/water/tmdl/index.html#drafttmdl. Three comment letters were sent during the public comment period, which were three identical requests for a contested case hearing. The comments were that the background measurements of bacteria only included wildlife, and the petitioners believe there is a significant amount of residual bacteria in soils and sediment that were not included in the TMDL. There was a study (the Sadowsky study) that indicated there was fecal coliform in soil and MPCA acknowledges the presence of bacteria as indicated in the Sadowsky study, but did not calculate or measure natural background as a separate allocation. MPCA also met with Dr. Sadowsky who cautioned against using his work to determine allocations. MPCA did add language to the final TMDL based on these meetings, with concurrence of Dr. Sadowsky, which is included in this final TMDL and several other TMDLs with the same issue. The Findings of Fact (FOF) states:

"The MPCA does not dispute that the draft Buffalo Creek Bacteria TMDL does not include a separate, explicit load allocation for natural background sources. The MPCA staff considered whether it was possible to differentiate natural background as a separate component of the load allocation. It was determined this was not reasonable and not practical based on the complexity of the problem, the time constraints, the availability of resources and monitoring data, and the management objectives under consideration"

Therefore, the three petitions for a contested case hearing were denied. The resulting FOF from the hearing is dated September 23, 2013 and is included in the final TMDL submittal and in the Administrative Record.

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

12. Submittal Letter

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

Comment:

The EPA received the final Buffalo Creek bacteria TMDL on November 4, 2013, accompanied by a submittal letter dated October 23, 2013. The submittal letter explicitly stated that the final bacteria TMDLs for Buffalo Creek (AUIDs 07010205-501 and 07010205-502) were being submitted to EPA pursuant to Section 303(d) of the Clean Water Act for EPA review and

approval. The letter clearly stated that this was a final TMDL submittal under Section 303(d) of CWA. The letter also contained the name of the watershed as it appears on Minnesota's 303(d) list, and the causes/pollutants of concern. This TMDL was submitted per the requirements under Section 303(d) of the Clean Water Act and 40 CFR 130.

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

13. Administrative Record

Conclusion

After a full and complete review, EPA finds that the bacteria TMDLs for the Buffalo Creek watershed satisfy all of the elements of an approvable TMDL. This approval addresses 2 segments for *E. coli* for a total of 2 TMDLs in the AUIDs 07010205-501 and 07010205-502.

EPA's approval of this TMDL 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 the CWA Section 303(d) for those waters.