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

DEC 21 2010

REPLY TO THE ATTENTION OF:

WW-16J

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

Dear Mr. Eger:

The United States Environmental Protection Agency has conducted a complete review of the final Total Maximum Daily Loads (TMDLs) for Brown's Creek, including supporting documentation and follow up information. Brown's Creek is located in east-central Minnesota, in Washington County. The TMDLs address the Aquatic Life Use impairment due to excessive heat and sediment.

The TMDLs meet the requirements of Section 303(d) of the Clean Water Act (CWA) and EPA's implementing regulations at 40 C.F.R. Part 130. Therefore, EPA hereby approves Minnesota's two TMDLs for heat and total suspended solids for Brown's Creek. 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: Chris Klucas, MPCA
David L. Johnson, MPCA

wq-iw6-05g

TMDL: Brown's Creek TMDL, Minnesota
Date: December 21, 2010

DECISION DOCUMENT FOR THE BROWN'S CREEK WATERSHED, 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: The Minnesota Pollution Control Agency (MPCA) developed TMDLs for the Brown's Creek watershed in east-central Minnesota. By implementing measures to reduce heat and sediment loadings, the TMDLs will address the impairment of the aquatic life use in the watershed. Table 1, below, identifies the waterbody segment covered by the TMDL as it appears on the draft Minnesota 2010 303(d) list. Minnesota's priority rankings for TMDL waters are reflected by the target dates for start and completion of TMDL studies. For Brown's Creek, the target completion date is 2012.

Table 1. Draft 2010 303(d) List Summary

River ID	Name	Designated Uses	Basis of Impairment	Pollutant
07030005--520	Brown's Creek: T30 R20W S18, west line to St. Croix River	Aquatic Life	Lack of coldwater assemblage; Turbidity*	Heat; Total suspended solids (TSS)

*Newly listed in 2010

The Brown's Creek watershed is located in east-central Minnesota. The TMDL addresses part of Washington County (Figure 1 of the TMDL). The overall watershed is 19,000 acres in size. Although only the lower portion of the creek is listed as impaired, MPCA developed the TMDLs to address the entire watershed. For modeling purposes, the watershed was subdivided into several subwatersheds (Figure 2 of the TMDL), as several portions of the watershed only discharge after significant rain events. MPCA defined several subwatersheds within the Brown's Creek watershed as landlocked. MPCA determined that these subwatersheds contribute stormwater under large storm events. Brown's Creek flows east into the St. Croix River.

Topography and Land Use: The land use in the watershed is mixed. Undeveloped land accounts for approximately 40% of the land use within the watershed, urban land (i.e. single family attached, single family detached, park, recreational and preserve, office, etc.) accounts for approximately 30% of land within the watershed, agriculture approximately 23% of land within the watershed, and open water approximately 7% of land within the watershed. Much of the lower watershed is urban/suburban, while the upper portion of the watershed is undeveloped land, agricultural land, or single family homes (Table 3 of the TMDL). Several cities are present in the watershed, including Stillwater, Oak Park Heights, Lake Elmo, Grant, and Hugo.

Pollutant of concern: The pollutants of concern for these TMDLs are heat and sediment. To determine the cause of the biota impairments, MPCA used a Stressor Identification process (Appendix A of the TMDL).

Heat: The lower portion of Brown's Creek is impaired due to excessive heat. The high temperatures impact the life cycle of brown trout in the creek, both due to overall high temperatures as well as frequency and duration of the exceedences (Page 17 of the TMDL).

Sediment: The lower portion of Brown's Creek was also determined to be impaired due to excessive sediment, specifically total suspended solids (TSS).

Pollutant sources:
Heat: Several sources for heat were identified in the TMDL (Section 3.E and Appendix A of the TMDL). The sources are generally linked to decreased groundwater flow into the creek and lack of shading. Groundwater flow in the watershed is cooler than the overland flow during the summer months, so when groundwater flow is reduced, the temperatures in the creek rise.

Impervious surfaces significantly contribute warm water to the creek, as precipitation runs across the warm surfaces, through the stormwater systems, and into the creek. Point sources of heat include regulated stormwater in the watershed Municipal Separate Storm Sewer Systems (MS4s).

Non-point sources include run-off from croplands/undeveloped lands, non-regulated urban run-off, and a lack of shading along the creek. MPCA believes the precipitation that falls onto the surface runs off fairly quickly, picking up heat as it flows into the creek, and also reducing groundwater recharge, thereby increasing warm water and reducing cool water inflow. Together with a lack of shading and higher turbidity levels (turbid waters retains heat more quickly), Brown's Creek is no longer supporting the appropriate coldwater assemblage (Page 42 of the TMDL).

Sediment: Several sources for sediment were identified in the TMDL (Section 3B and Appendix A of the TMDL). Point sources include municipal stormwater regulated under the MS4 program. At this time, there are four cities regulated under the MS4 program, and a fifth will likely come under regulation soon. Sediment washed off various surfaces enters the stormwater system, and while some may settle out in holding ponds, some (particularly the lighter suspended component) is discharged to the creek. Construction activities are also regulated under discharge permits, and MPCA assigned a categorical allocation.

Non-point sources include run-off from agricultural and undeveloped lands and unregulated stormwater runoff. Section 2C of the TMDL discusses the process used by MPCA to determine the current loading from the various sources. MPCA noted that the TSS values are generally higher at higher flows, indicating that most of the sediment load results from stormwater impacts.

Future growth trends: As stated in Section 3A of the TMDL, future growth was considered during the development of the TMDL. The model used to determine surface run-off was based upon the projected 2020 land use in the watershed. In addition, MPCA included the City of Oak Park Heights in the wasteload allocation determination, as the City is likely to become a designated MS4 in the near future.

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

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

The TMDL submittal must include a description of the applicable State/Tribal water quality standard, including the designated use(s) of the 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:
Section 2 of the TMDL describes the designated uses and numeric criteria applicable to this watershed.

Use Designation:
The Brown's Creek watershed is designated as 2A for aquatic life use and recreation (MN. R. 7050.0222). From Section 2 of the TMDL;

> Class 2A waters. The quality of Class 2A surface waters shall be such as to permit the propagation and maintenance of a healthy community of cold water sport or commercial fish and associated aquatic life, and their habitats. These waters shall be suitable for aquatic recreation of all kinds, including bathing, for which the waters may be usable. This class of surface waters is also protected as a source of drinking water.

Numeric Standards:
Heat: MPCA does not have a numeric criterion for temperature; the state standards require "no material increase" in temperature. MPCA reviewed data relating to temperature stress on brown trout, and determined two targets. The first is the threat temperature (18.3°C or 65°F) , which is based upon impacts on trout growth and egg mortality. The second target (23.9°C or 75°F) is the critical temperature, defined as the temperature at which there is trout mortality (Section 2C of the TMDL).

Sediment: MPCA does not have a numeric criterion for sediment. The state standard (Minn. R. 7050.0222) for turbidity for Class 2A waters is 10 NTU (nephelometric turbidity units).

Targets:
Heat: MPCA converted the temperature goal into a heat load based upon the flow in the creek and the internal energy of water (Section 2B of the TMDL). The threat target of 18.3°C was used to address the temperature impacts, and the load determined in million kilo-joules (KJ) per day.

Sediment:
Turbidity cannot be converted into loads because it is a dimensionless value; TSS is being used as the surrogate measure for turbidity in the TMDL calculation. MPCA developed a relationship between turbidity and TSS to be able to use the 10 NTU turbidity standard in a load allocation scenario. The turbidity measurements taken from the same sample as the TSS measurements were defined as "paired" measurements. Using the paired turbidity and TSS measurements for the watershed, a multiple regression technique was used to predict TSS based on turbidity. This regression technique resulted in a value of 23 mg/L for TSS to the 10 NTU equivalent. The R^2 value of 0.99 indicates that the strength of the correlation between the two variables is very good (TSS and turbidity) (Figure 21 of the TMDL).

To determine the cause of the impacts on aquatic life use, MPCA used the Stressor Identification process (Appendix A of the TMDL). The Causal Analysis/Diagnosis Decision Information System (CADDIS) was used to determine which pollutant or pollutants were causing the impairment. Based upon this process, MPCA determined that copper, heat and TSS were the pollutants causing the biota impairments. MPCA reviewed the copper data and determined that some of the values were questionable, and therefore did not develop a TMDL for copper. Further sampling will be done to determine the role of copper in the impairment. Only TMDLs for TSS and heat were developed. MPCA believes that achieving the targets in the watershed will result in the aquatic life use to be attained.

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

3. Loading Capacity - Linking Water Quality and Pollutant Sources

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

Comment:

Loading capacity: The loading capacities were calculated for each pollutant, and are found in Section 3 of the TMDL. Tables 2 and 3 below are a summary of the loading capacities for each of the pollutants for Brown's Creek.

Table 2 TMDL summary for heat in Brown's Creek

Source		TMDL (Million KJ/day)				
		High Flows	Moist Conditions	Mid-Range Flows	Dry Conditions	Low Flows
		81.3 - 17.5 cfs	17.5 - 9.7 cfs	9.7 - 7.6 cfs	7.6-5.9 cfs	5.9 - 0.0 cfs
LA - Watershed		2,732	517	223	108	59
LA - Baseflow		1,668	1,630	1,342	1,150	970
WLA – Permitted stormwater						
MS4 or other source	Permit #					
Lake Elmo	MS400098	1.1	0.20	0.09	0.04	0.023
Oak Park Heights	Future	6.8	1.3	0.55	0.27	0.15
Stillwater	MS400259	289	55	23.6	11.4	6.2
Construction stormwater	Various	0.3	0.05	0.02	0.01	0.006
Industrial stormwater	No current permitted sources	0.3	0.05	0.02	0.01	0.006
Total		4,697	2,203	1,589	1,270	1,036

Table 3 TMDL summary for TSS in Brown's Creek

Source		% Allocation	TMDL (lbs/day)				
			High Flows	Moist Conditions	Mid-Range Flows	Dry Conditions	Low Flows
			81.3 - 17.5 cfs	17.5 - 9.7 cfs	9.7 - 7.6 cfs	7.6-5.9 cfs	5.9 - 0.0 cfs
LA		90.2%	2,800	1,313	946	757	617
WLA – Permitted stormwater							
MS4 or other source	Permit #						
Lake Elmo	MS400098	0.035%	1.1	0.5	0.4	0.3	0.2
Oak Park Heights	Future	0.22%	7.0	3.3	2.4	1.9	1.5
Stillwater	MS400259	9.5%	296	139	100	80	65
Construction stormwater	Various	0.01%	0.3	0.1	0.1	0.1	0.1
Industrial stormwater	No current permitted sources	0.01%	0.3	0.1	0.1	0.1	0.1
Total		**100%**	**3,105**	**1,456**	**1,049**	**839**	**684**

Method for cause and effect relationship:
The loading capacities for these pollutants for Brown's Creek were determined by MPCA using the load duration curve method (LDC) (Section 3 of the TMDL). Pollutant concentrations were measured at the water quality monitoring station in the watershed. A simplified explanation is provided below.

1. Flow data - First, flow data are required. There was one flow gage in the watershed, at sampling site Watershed Outlet Monitoring Program (WOMP) located on the Brown's Creek, that provided flow data. This MPCA gage provided data from 2000-2007. MPCA also calculated a rating curve, which is based upon multiple cross-sectional flow measurements over a wide variety of flow levels.
2. Water Quality data - This dataset is the monitored pollutant data from 2000-2007 for TSS and 2007 temperature data.
3. Load Duration Curves - The plots are derived from the flow data and water quality data described above. Existing monitored water pollutant loads, represented by the points on the plot, are compared to target loads, the water quality standard line. If the existing loads are below (less than) the target line, no reduction needs to occur. Conversely, if the existing loads are above (greater than) the target load, a reduction is necessary to reach the target.
4. Analysis - The final step is to link the geographic locations of load reductions needed to the flow conditions under which the exceedences occur. Specific flow regimes contributing to pollutant loads, represented by the graph, are identified to determine under what flow conditions the pollutant exceedences are occurring. Both the heat and TSS LDCs in the TMDL show that the exceedances occur under mid to high flow conditions. By knowing the flow conditions under which exceedences are occurring, MPCA can focus implementation activities on those sources most likely to contribute loads. Overall, the allocations estimate a 6% reduction needed for heat, and a 74% reduction in TSS for the watershed.

Using the load duration curve approach allows MPCA to determine which implementation practices are most effective for reducing pollutant loads based on flow magnitude. For example, if loads are significant during storm events, implementation efforts can target those best management practices (BMPs) that will most effectively reduce runoff. This allows for a more efficient implementation effort. These TMDLs are concentration-based, and tie directly into Minnesota's water quality standard for the pollutants. The target for these TMDLs is the water quality standard, and therefore meeting this loading capacity should result in attainment of water quality standards. The load duration curve is a cost-effective TMDL approach, to address the reductions necessary to meet WQS for these pollutants.

Weaknesses of the TMDL analysis are that non-point source (NPS) load allocations were not assigned to specific sources within the watershed, and the identified sources of the pollutants were assumed based on the data collected in the watershed, rather than determined by detailed monitoring and sampling efforts. Moreover, specific source reductions were not quantified. However, EPA believes the strengths of the State's proposed TMDL approach outweigh the weaknesses and that this methodology is appropriate based upon the information available. In the event that the pollutant levels do not meet WQSs in response to implementation efforts described in the TMDL submittal, the TMDL implementation strategy may be amended as new information on the watershed is developed, to better account for contributing sources of the impairment and to determine where reductions in the Brown's Creek watershed are most appropriate.

To further refine the TMDL TSS loads, MPCA applied the Program for Predicting Polluting Particle Passage thru Pits, Puddles, & Ponds (P8) model to the lower watershed. MPCA subdivided the watershed into numerous subwatersheds. The P8 model predicts stormwater pollutants from run-off in urban environments. The model assumes water flowing through a series of pipes and ponds. MPCA used the model to determine the high-priority subwatersheds for load reduction. For sediment, all load was determined to be generated from the watershed. No instream load was determined. MPCA noted that several subwatersheds in the overall watershed are landlocked, and only contribute under large storm events. MPCA determined these areas contribute only a very small amount of load (Table 7 of the TMDL).

For heat, MPCA determined both a watershed load and an instream component. The baseflow load was determined to calculate the incoming groundwater load of heat into the creek. The baseflow was subtracted from the overall load capacity; the remaining load was assigned to the WLA or LA (Section 3E of the TMDL).

Critical conditions:
The critical conditions for the Brown's Creek TMDLs are the summer storm events (Section 3F of the TMDL). Significant storm events contribute large amounts of warm water to the system, as well as sediment. In addition, the storm events increase the overland runoff. MPCA reviewed the TSS and heat data, and determined that both pollutants levels were generally elevated after storm events, suggesting that pollutant sediment loads increased during and after storm events.

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

4. Load Allocations (LAs)

EPA regulations require that a TMDL include LAs, which identify the portion of the loading capacity attributed to existing and future 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:
The LAs for Brown's Creek for heat and TSS are in Tables 2 and 3 above. As discussed in Section 3 above, MPCA determined a LA for heat for watershed loads and for instream (groundwater) loads. Although allocations were not developed for components of the load allocation, MPCA did determine the amount of sediment loading from various subwatersheds. Appendix B of the TMDL discusses the results from MPCA's review, and provides information that MPCA can use to determine the impacts from potential sources. These impacts can be used by MPCA to determine the appropriate implementation measures.

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

5. Wasteload Allocations (WLAs)

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

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

Comment:
The WLAs for sediment and heat are in Tables 2 and 3 above. All point sources are MS4 dischargers, and include the future regulated discharge from the City of Oak Park Heights.

A WLA was determined for permitted construction sites in the watershed. The WLA was determined by multiplying the percent acreage of construction sites in the watershed by the loading capacity. This results in the WLA for construction sites.

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

6. Margin of Safety (MOS)

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

Comment:
MPCA used an implicit MOS for the TMDLs for heat and TSS in Brown's Creek. MPCA believes the margin of safety is appropriate because the use of the LDC provides an accurate account of existing stream conditions (calculated by multiplying daily flows by existing pollutant levels), and an accurate account of the stream's loading capacity (calculated by multiplying daily flows by the appropriate water quality target). In other words, there is a good fit between observed (existing) data and predicted data using the LDC approach, thus providing a relatively accurate determination of the TMDL reductions needed. MPCA accounts for any uncertainty in this method, by incorporating the MOS.

MPCA also provided MOS by noting that numerous best management practices (BMPs) have been installed in the watershed. Many of the BMPs have either been installed since the creek was sampled in 2007, or were installed at approximately the same time, and the effects had yet to be seen. As a result the overall reductions needed are likely higher than needed to achieve the water quality standards. MPCA also noted that calculations for the threat temperature for trout are conservative (Section 3C of the TMDL). It is difficult to determine the specific temperature that will cause stress to the fish, and MPCA believes the target is conservative.

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

7. Seasonal Variation

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

Comment:
MPCA used the Load Duration Curve method for heat and TSS, which inherently accounts for seasonal variation by using daily flows over a multi-year year period (Section 3 of the TMDL). EPA agrees that this properly accounts for seasonal variations.

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

8. Reasonable Assurances

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

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

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

Comment:
Reasonable Assurance is discussed in Section 4 of the TMDL. A summary is provided below:

The Brown's Creek Watershed District (BCWD) was formed in 1997 to improve water quality in the Brown's Creek watershed. The BCWD developed their 3rd generation watershed plan in 2007 to determine high priority projects and restoration activities. This plan also discusses the capital improvements needed to achieve the plan goals, and served as the basis for revising the stormwater rules for the watershed. The rules not only regulate stormwater run-off, but also contain standards for protection of groundwater-dependent streams. Numerous cities in the watershed have updated their local comprehensive planning efforts, which are required to be in compliance with the BCWD watershed plan.

The regulated MS4 entities in watershed will be required to update their Storm Water Pollution Prevention Plan (SWPPP) as part of the permit requirements. These efforts will help ensure the stormwater reductions are implemented. The BCWD also has a cost-share program to help

implement activities. Several state and federal grant programs are currently administered by the BCWD.

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

9. Monitoring Plan to Track TMDL Effectiveness

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

Comment:
The BCWD has committed to continue flow and water quality monitoring along Brown's Creek. MPCA will continue to monitor the creek as part of the basin monitoring program. This monitoring will include fish and invertebrate communities as well as water quality (Section 6 of the TMDL).

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

10. Implementation

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

Comment:
Section 5 of the TMDL contains the preliminary implementation plan, which will be revised and finalized after TMDL approval. The plan addresses reduction of TSS and heat as well as copper in the watershed. MPCA believes that habitat improvement will be critical to eliminating the impairments in the creek. Many of the ongoing and proposed activities are discussed in Section 8 above.

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:
Several stakeholder meetings were held by MPCA in order to involve interested stakeholders. The invitees included local cities, representatives from the county boards, Soil and Water Conservation Districts, and local residents. All meetings were open to the public. Meetings were held on multiple dates in 2007 and 2008.

MPCA placed the Draft Brown's Creek TMDL on public notice from August 16, 2010, to September 15, 2010, to provide an opportunity for public comment. The draft TMDL was posted at: http://www.pca.state.mn.us/water/tmdl/tmdl-draft.html, the MPCA's TMDL web site. Two sets of comments were received during the TMDL public notice period. The comments and MPCA's responses were included in the TMDL submittal. Public comments were addressed appropriately by MPCA.

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

12. Submittal Letter

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

Comment:
On November 18, 2010, EPA received the Brown's Creek TMDL, and a submittal letter dated November 9, 2010, signed by Paul Eger, Commissioner, addressed to Tinka Hyde, U.S. EPA,

Region 5, Water Division. In the submittal letter, MPCA stated "I am pleased to submit the Brown's Creek Total Maximum Daily Load (TMDL) study for impaired biota to the U.S. Environmental Protection Agency (EPA) for final approval". The submittal letter included the name and location of the waterbody and the pollutants of concern.

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

13. Conclusion

After a full and complete review, EPA finds that the heat and sediment TMDLs for the Brown's Creek watershed satisfy all of the elements of an approvable TMDL. This decision document addresses 2 TMDLs for 1 waterbody segment as identified on Minnesota's draft 2010 303(d) list (Table 1 above).

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.