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

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REPLY TO THE ATTENTION OF
WW-16J

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

Dear Ms. Corrigan:

The United States Environmental Protection Agency (U.S. EPA) has conducted a complete review of the final Long Prairie River Watershed Total Maximum Daily Load for Low Dissolved Oxygen, including supporting documentation and information. Based on this review, U.S. EPA has determined that Minnesota's TMDLs for six segments of the Long Prairie River, addressing six impairments for low dissolved oxygen meets 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 eighteen (18) TMDLs addressing six impairments for the Long Prairie River. 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 TMDL as required. If you have any questions, please contact Kevin Pierard, Chief of the Watersheds and Wetlands Branch, at 312-886-4448.

Sincerely yours,

Jo Lynn Traub
Director, Water Division

Enclosure

cc: Jeff Risberg, MPCA
Faye Sleeper, MPCA

TMDL Decision Document
Long Prairie River Watershed (Minnesota)
Date of Decision Document: August 3, 2005

Decision Document for Approval of Long Prairie River Watershed TMDLs for Dissolved Oxygen

Section 303(d) of the Clean Water Act (CWA) and U.S. 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 U.S. EPA to determine if a submitted TMDL fulfills the legal requirements for approval under Section 303(d) 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. 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 U.S. 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 non-point 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 non-point 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 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; chlorophyl *a* and phosphorus loadings for excess algae; length of riparian buffer; or number of acres of best management practices.

Comments:
The Long Prairie River flows approximately 92 miles from the headwaters at Lake Carlos to its outfall near Motley, Minnesota into the Crow Wing River, and eventually into the Upper Mississippi River. The river flows through Douglas, Todd and Morrison counties. The river is wide, shallow, meandering and flat except for the last 10 miles which are steeper and less sinuous. All six reaches of the Long Prairie River are identified on Minnesota's 2004 303(d) list as not attaining the aquatic life and aquatic consumption uses. The state prepared a TMDL for three pollutants for each of these six reaches. Low dissolved oxygen (DO) and fish Index of Biological Indices (IBI) were identified as impairments contributing to nonattainment of the aquatic life use. Mercury in fish tissue was identified as the impairment contributing to nonattainment of the aquatic consumption use. These TMDLs are only addressing the low dissolved oxygen impairment. Future TMDLs are planned by the state to address the fish IBI and mercury fish consumption impairments. During the TMDL study the state investigated ammonia toxicity at critical conditions in addition to critical conditions for low dissolved oxygen. Ammonia toxicity is not a current impairment identified for any reach of Long Prairie River. However, in order to look at a complete picture of potential problems associated with the aquatic life use not being attained in Long Prairie River the state thought it was relevant to consider ammonia toxicity in the modeling efforts. Un-ionized ammonia was the pollutant of concern for ammonia toxicity in model simulations. The TMDL study did not provide a full assessment pursuant to Minnesota's assessment criteria of ammonia toxicity in Long Prairie River nor did the study establish TMDLs for un-ionized ammonia for any reach of Long Prairie River.

The following six reaches, as identified on the Minnesota 2004 303(d) list for low dissolved oxygen impairments, are being addressed by these TMDLs:

Impaired Reach Name	Assessment Unit ID	Year Listed
Long Prairie River; Fish Trap Creek to Crow Wing River	07010108-501	1994

TMDL Decision Document
Long Prairie River Watershed (Minnesota)
Date of Decision Document: August 3, 2005

Impaired Reach Name	Assessment Unit ID	Year Listed
Long Prairie River; Moran Creek to Fish Trap Creek	07010108-502	2002
Long Prairie River; Turtle Creek to Moran Creek	07010108-503	2004
Long Prairie River; Eagle Creek to Turtle Creek	07010108-504	2002
Long Prairie River; Spruce Creek to Eagle Creek	07010108-505	2004
Long Prairie River; Headwaters (Lake Carlos) to Spruce Creek	07010108-506	2002

The TMDL study includes discussion of Eagle Creek, Headwaters to Long Prairie, assessment unit ID 07010108-507. However, this reach is not currently listed as impaired for low dissolved oxygen. This reach is currently listed for fish IBI. Eagle Creek is a tributary to Long Prairie that was considered in the modeling efforts associated with development of the TMDLs.

For purposes of the TMDL study the Long Prairie River watershed was considered to be the 647 square mile drainage area downstream from Lake Carlos. The headwater outflow from Lake Carlos drains an additional 236 square miles. This headwater outflow has been found to be of very high quality. Land use in the watershed includes 41% agricultural, 24% grassland and pasture, 21% forest, 10% wetland or water, and urban and developed rural land making up the remainder. The land use immediately adjacent to the river is predominately agriculture and wetlands with some reaches of the river having well developed riparian zones.

Point sources within the watershed include seven municipal wastewater treatment operations, a Superfund site discharging treated groundwater (former dry cleaner impacted with tetrachloroethene), five concentrated animal feedlot operations (CAFOs), and two historical sources. A copy of Table 4-1 from the TMDL study is included at the end of this decision document. Table 4-1 provides NPDES permit numbers and descriptions of all these potential point sources. There are no stormwater permits in the Long Prairie River watershed. The CAFOs in the watershed operate under NPDES permits which do not allow direct discharge to surface waters.

Of the seven municipal wastewater treatment operations, two (Alexandria Lake Area Sanitary District (ALASD) and the City of Miltona) were not considered to contribute to the low dissolved oxygen impairment in any of the Long Prairie River reaches. The remaining five wastewater treatment operations currently operate pond systems with permitted seasonal discharges allowed in the spring and fall. A description of the discharges is provided in Table 4-1. The City of Long Prairie is currently constructing a new continuous discharge which will

replace one of the existing discharges; permit number MN0066079 discharge SD-001 will replace permit number MN0020303 discharge SD-003.

Two historical sources which were considered to be potential contributors to the existing low dissolved oxygen impairments in the upper reach of Long Prairie River are a former meat packing plant and an abandoned municipal treatment pond. The former meat packing plant is suspected of discharging untreated waste, high in oxygen demand, for approximately 100 years prior to 1968 to local wetlands. The City of Carlos's former wastewater treatment pond is also suspected of being a potential source from 1968 to 1989. There are no known discharges direct to Long Prairie in this pond's 21 years of operation. Wastewater from the pond infiltrated into the subsurface and ultimately discharged into the riparian wetland. Although the ponds are not existing point sources to which specific allocations can be assigned, the effects from these two historical discharges may still be contributing to the low dissolved oxygen observed in the upper reach of Long Prairie River and the riparian wetlands today.

Nonpoint sources within the watershed include agricultural and urban runoff, diffuse runoff from manure application to cropland, and runoff from small livestock operations that are not regulated as CAFOs under federal laws. Another nonpoint source identified was sediment oxygen demand (SOD). SOD results from the deposition of particulate organic matter into the river channel. The particulate organic matter originates from a variety of sources. SOD also results from decaying in-channel plant biomass. SOD removes dissolved oxygen from the water column. SOD can also occur naturally in wetlands. The State has determined that the low dissolved oxygen found in the near-headwater reach results from SOD in the riparian wetlands when a flow exchange exists between the riparian wetlands and the main channel of the river.

The TMDL study does provide for future growth by including an unallocated load. Any new loadings to an impaired reach of Long Prairie River would need to fall within the unallocated oxygen demand load allocations specified in the TMDLs. Ultimate use of these unallocated loads will be decided by state and local decision makers. The TMDL study also discusses an allowance for future growth for existing point sources. Model projection simulations used design flows and permitted maximum flows for point sources in the development of the WLAs in these TMDLs. These design and permit maximums are generally substantially greater than the actuals for the municipalities. For example, in the projection simulations the design flows used were approximately 17% greater than the flows actually needed, therefore, this TMDL study considers that 17% difference as potential growth. U.S. EPA recognizes that the flows utilized in the projection simulations are generally above actual flow values. NPDES permits, however, for these municipalities already allow discharges up to the design and maximum flows so potential growth is really provided for in the permit, not the TMDL.

Minnesota's 2004 303(d) list includes a projected schedule for TMDL completions. This schedule reflects the state's priority ranking of impaired waters. The schedule for Long Prairie

River TMDLs has a priority ranking within the top 1% of Minnesota's listed waters.

U.S. EPA finds that the TMDLs submitted by the State for Long Prairie River Watershed satisfy the requirements of this 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)). 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.

Comments:
Minnesota Rules, Chapter 7050, identifies the following designated uses and classes to the Long Prairie River and its tributaries: aquatic life and recreation (Class 2B); industrial consumption (Class 3B); agriculture and wildlife (Class 4A and 4B); aesthetic enjoyment and navigation (Class 5); and other uses (Class 6). Class 2B has the most stringent DO standards, therefore, the applicable DO water quality standard is 5 milligrams per liter (mg/L) as a daily minimum. The low flow conditions under which this standard is required to be met are the 7-day, 10-year low flow (7Q10). Minn. R. 7050.022 Subp. 4.

The pollutant of concern for low dissolved oxygen in this TMDL study is biochemical oxygen demand (BOD). BOD occurs when organic materials decay and consume dissolved oxygen in the process leaving less oxygen available for aquatic life. Carbonaceous biochemical oxygen demand (CBOD) is a general measure of organic materials such as sewage solids, animal wastes, animal and other food processing wastes, and plant litter. CBOD represents the oxygen

equivalent of the organic matter in a sample, i.e., the amount of oxygen that micro-organisms require for respiration. Nitrogenous biochemical oxygen demand (NBOD) is a general measure of how much oxygen is used to break down nitrogen based pollutants, in this case ammonia. Nitrogen is a constituent of organic matter. Micro-organisms transform organic nitrogen to ammonia nitrogen; nitrification of the ammonia nitrogen by certain bacteria then transforms the ammonia nitrogen to nitrate nitrogen. During the process of nitrification oxygen is consumed. NBOD is the oxygen equivalent for the nitrification process. SOD is a measure of the rate at which dissolved oxygen is removed from the water column by the sediment. Studies demonstrate that different sediments take up dissolved oxygen at different rates.

CBOD and NBOD are pollutants of concern for both point and nonpoint sources. SOD is a pollutant of concern for nonpoint sources only. Specific allocations have been assigned for these parameters, CBOD, NBOD, and SOD, for each of the six impaired reaches of Long Prairie River being addressed by these TMDLs.

U.S. EPA finds that the TMDLs submitted by the State of Minnesota for the Long Prairie River Watershed satisfy the requirements of this element.

3. Loading Capacity - Linking Water Quality and Pollutant Sources

A TMDL must identify the loading capacity of a waterbody 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 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. 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 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 non-point source loadings under such *critical conditions*. In particular, the TMDL should discuss the approach used to compute and allocate non-point source loadings, e.g.,

meteorological conditions and land use distribution.

Comments:
The total loading capacity, i.e., total maximum daily load, for each of the impaired reach of the Long Prairie River is set forth in Table 11-2 of the TMDL study and on page 1-5 of the TMDL study. Each impaired reach has a total oxygen demand (lbs/day) established. Additionally, the total oxygen demand is divided between each of the pollutants of concern, i.e., CBOD, NBOD, and SOD, for each impaired reach. Table 11-2 from the TMDL study is included at the end of this decision document. The total maximum daily loads and allocations set forth in this table are the loads and allocations being approved in this decision. Modeling considerations that were used to establish these TMDLs are discussed below.

QUAL-TX model was used to establish the TMDLs and allocations in this TMDL study. QUAL-TX is a public domain steady state one-dimensional water quality model developed by the water quality standards section of the Texas Natural Resource Conservation Commission. The model is a modified version of U.S. EPA's QUAL-II model. QUAL-TX predicts dissolved oxygen concentrations in response to loadings of BOD and NH_3-N. Table F-1 of the TMDL study and Figure 8-1 provide the model reaches, inflow locations, point sources, monitoring stations, and corresponding 303(d) impaired reaches.

Existing data collected by the Minnesota Pollution Control Agency (MPCA) and the Todd Soil and Water Conservation District (Todd SWCD) in addition to data collected in four studies specific to the development of this TMDL study were considered in establishing the TMDLs and allocations. Todd SWCD collected water quality data between 1996 and 2002 and MPCA collected data from 1974 to 2000. Data included flow, dissolved oxygen, temperature, pH, conductivity, total phosphorus, total nitrogen, ammonia nitrogen (NH_3-N), nitrate/nitrite-nitrogen (NO_2/NO_3-N), and BOD. A summary of this existing data is presented in Appendix C of the TMDL study. These data reflect water quality trends over approximately a 30 year period and for the most part, except for seasonal scatter, water quality trends have not changed significantly. As part of the TMDL development three synoptic surveys were conducted and one special survey; Study 1 August 20-24, 2001; Study 2 September 24-25, 2001; and Study 3 February 7-8, 2002; and Special Study 1 August 2, 2001. The QUAL-TX model was calibrated to the synoptic survey and validated with the monitoring data from Todd SWCD. The model was calibrated using a combination of visual best fit and error minimization techniques. Calibration procedures included hydraulic calibration matching time of travel and depth of measurement, then reaeration rates were specified and calibration of nutrients and BOD occurred. Decay rates were adjusted to fit the model predictions to in-stream field data. As the final step in the calibration, photosynthetic productivity and sediment oxygen demand were balanced. In most cases percentage differences were within acceptable tolerances. Some total phosphorus and NH_3-N percentage differences were high, because the parameters were close to their detection limits. Therefore, the large percentage differences corresponded to small concentration differences. The QUAL-TX model was also validated in order to substantiate the model's predictive power

under conditions similar to those under which the model was calibrated. Under warm-season conditions, with and without point source discharges, model predictions as calibrated for the synoptic survey data fit well within observed ranges.

The calibrated and validated model was then used to evaluate spring, summer, and winter critical conditions. Minnesota water quality standards establish a critical flow condition of 7Q10 for dissolved oxygen. The spring season 7Q10 accounted for seasonal variations in NH_3-N concentrations from discharging municipal treatment systems; summer season 7Q10 was evaluated to account for extreme low flow and high temperature; and winter 7Q10 accounted for the limitation of reaeration by ice cover. Additionally, violations of the dissolved oxygen water quality standard have been observed during the winter season. During model simulations to determine point source load reductions the spring critical stream flow conditions were moderately increased for three of the point sources in order to allow these point sources to discharge with existing effluent quality as currently permitted. This modified spring critical condition is referred to in the TMDL study as the "modified spring 7Q10." The modified spring 7Q10 critical condition was used to establish the TMDLs and allocations that are being approved.

Design flows and permissible maximum rates were used in all three of the critical condition simulations for five of the seven municipal WWTFs. Except for Long Prairie and the Superfund site point source, existing point source discharge rates were based upon a permissible maximum drawdown rate (6"/day) from the treatment ponds. Maximum seasonal discharge volumes were assumed to be discharged over 75 days at a constant rate. The Superfund point source discharge was based upon the remediation system's operation manual and its discharge from the groundwater pumpage system was assumed to be constant. The two municipal WWTF not considered in the modeling simulations were ALASD and City of Miltona. Alexandria Lake Area Sanitary District (ALASD) lies within the watershed. However, its discharge does not impact Long Prairie River; ALASD discharges high quality effluent to the chain of lakes upstream from Lake Carlos. The City of Miltona's discharge is attenuated by a slough before reaching an unnamed tributary of Long Prairie. Therefore, this facility was determined to have no impact to the dissolved oxygen impairment in Long Prairie River.

Flow rates from tributaries were considered inflows into the model. Flow rates were considered from the August and September 2001 synoptic studies. No flow rates were available from the February 2002 synoptic study since all tributaries were frozen. Groundwater inflows were also considered. Historical groundwater discharge rates and stream gauging data helped in the estimation of groundwater inflows. Additional nonpoint source inputs are all inflows that are not accounted for by tributary inflows or point source discharges plus benthic nutrient sources and SOD.

Using the calibrated and validated model, and using the three critical conditions previously discussed, model projection simulations with and without point sources were used to establish

necessary point source and nonpoint source reductions. To complete the TMDLs each reach's unallocated capacity for oxygen demanding loads was determined by adding a virtual point source at the reach head and finding the largest possible load that could be contributed by that virtual point source without causing a violation of the low dissolved oxygen water quality standard. These virtual point sources were assigned the same nominal flow rates (0.1 cfs). Therefore these sources acted essentially as mass loads. For all but one reach the summer 7Q10 was the critical condition. However, for reach 506 the modified spring 7Q10 was the critical condition.

U.S. EPA finds that the TMDLs submitted by the State of Minnesota for the Long Prairie River Watershed satisfy the requirements of this element.

4. Wasteload Allocations (WLAs)

U.S. 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. U.S. EPA does not require the establishment of a new TMDL to reflect these revised allocations as long as the total WLA, as expressed in the TMDL, remains the same or decreases, and there is no reallocation between the total WLA and the total LA.

Comments:
Table 11-2 attached to this decision document sets forth pollutant of concern WLAs for the five point sources considered in the modeling simulations. Effluent characteristics shown in Table F-23 of the TMDL study were used to define these WLAs. This decision is only approving the WLA's for each pollutant of concern for each point source as set forth in Table 11-2. Specifics about effluent characteristics of each WWTF's discharge will be considered and approved as part of the NPDES permit process.

Specific WLAs were not established for two of the five modeled WWTFs, Eagle Bend and Clarissa. These two WWTFs discharge to Eagle Creek, which is not identified on Minnesota's 303(d) list as impaired for low dissolved oxygen. Eagle Creek was specifically identified as a model reach in the QUAL-TX model. Loads from both of these WWTFs in addition to nonpoint source loads, both after attenuation in Eagle Creek, were considered in the model simulations and were determined not to contribute to the low dissolved oxygen impairment in Long Prairie River. The loads from both Eagle Bend and Clarrisa WWTFs, after attenuation in Eagle Creek, were combined to establish the "residual point source load" for Eagle Creek at the point Eagle Creek enters Long Prairie River.

U.S. EPA finds that the TMDLs submitted by the State of Minnesota for Long Prairie River Watershed satisfy the requirements of this element.

5. Load Allocations (LAs)

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

Comments:
LAs as set forth in Table 11-2 included at the end of this decision document are the LAs that are approved in this decision. LAs were established for each tributary inflow into Long Prairie River and the headwater inflow into Long Prairie River. Additionally, LAs were established for other nonpoint sources including SOD in the channel of Long Prairie River. Assignment of LAs in this manner is consistent with how nonpoint sources were modeled in QUAL-TX.

U.S. EPA finds that the TMDLs submitted by Minnesota for Long Prairie River Watershed satisfy the requirements of this 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)). U.S. EPA's 1991 TMDL Guidance explains that the MOS may be implicit, i.e., incorporated into the TMDL through conservative assumptions in the analysis, or explicit, i.e., expressed in the TMDL as loadings set aside for the MOS. If the MOS is implicit, the conservative assumptions in the analysis that account for the MOS must be described. If the MOS is explicit, the loading set aside for the MOS must be identified.

Comments:
The margins of safety for the Long Prairie TMDLs were assigned individually for point and nonpoint allocations. Point source allocations, i.e., WLAs, include an implicit margin of safety whereas the nonpoint source allocations, i.e., LAs, received an explicit margin of safety. The state chose to assign an explicit margin of safety to the LAs because for purposes of this TMDL, nonpoint source pollutant loads are usually more difficult to quantify. WLAs are based upon science and practices that have been well defined and conservative assumptions that can be quantified were used in model simulations.

The WLAs in the TMDLs include an implicit margin of safety. Model simulations for critical conditions included simultaneous discharge of all possible point sources for 75 days per year, in addition to critical low flow and extreme high temperatures. Model simulations at critical conditions are expected in TMDL development, however, the combination of critical conditions and simultaneous discharge make these TMDLs conservative. The current municipal wastewater systems operate pond systems that are only allowed discharges in the spring (April 1 to June 30) and the fall (September 1 to December 15). These systems can discharge intermittently during the allowed discharge time periods, but very rarely will be discharging simultaneously. Based upon discharge records for the past three years, for the five WWTFs considered in the TMDLs, most facilities discharged less than 10 days a month and some facilities only discharged one or two days some of the months. On average, all of the facilities, except Long Prairie, discharged 30 days or less throughout the whole of both allowed discharge time periods.

Nonpoint source allocations, i.e., LAs, were assigned an explicit margin of safety of 10% of the total load allocation for all nonpoint sources for each individual pollutant of concern for each impaired reach. SWAT modeling simulations demonstrated that nonpoint source reductions in sediment, total nitrogen, and total phosphorus loadings can be achieved. Reductions in these loads aid nonpoint sources in meeting the LAs established in these TMDLs. Achievable watershed loading reductions based upon one of the SWAT model simulations were between 11% and 19%. Model simulations, model calibrations, and model validations in this TMDL study support that a 10% explicit margin of safety for nonpoint sources is reasonable.

U.S. EPA finds that the TMDLs submitted by the State of Minnesota for the Long Prairie River Watershed satisfy the requirements of this element.

7. Seasonal Variation

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

Comments:
Seasonal variations in flow and temperature were accounted for in these TMDLs. Model simulations were run through the QUAL-TX model for spring, summer, and winter at the 7Q10 flow for each season. The summer 7Q10 condition considered both low flow and high temperatures; spring 7Q10 condition considered seasonal variation of NH_3-N concentrations in municipal stabilization ponds; and winter 7Q10 condition considered limitations of reaeration by ice cover.

U.S. EPA finds that the TMDLs submitted by the State of Minnesota for the Long Prairie River Watershed satisfy the requirements of this 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 non-point sources, and the WLA is based on an assumption that non-point source load reductions will occur, U.S. EPA's 1991 TMDL Guidance states that the TMDL should provide reasonable assurances that non-point 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 non-point sources. However, U.S. EPA cannot disapprove a TMDL for non-point source-only impaired waters, which do not have a demonstration of reasonable assurance that LAs will be achieved, because such a showing is not required by current regulations.

Comments:
Reasonable assurances for achieving the necessary WLAs will be through the state NPDES permit process. Permit conditions will need to be consistent with the assumptions and requirements used to establish the approved wasteload allocations. Reasonable assurance for nonpoint source load allocations include best management practices such as riparian buffer strips, grassed waterways, contour plowing, and crop rotations. Implementation of BMPs are already underway in the watershed through Clean Water Partnership grants. Additionally,

continued maintenance of lands in the Conservation Reserve Program (CRP)[1] can also provide some reasonable assurance that nonpoint source load reductions will be attainable. MPCA evaluated two scenarios through the SWAT model in order to consider the effectiveness of watershed management practices in attaining necessary nonpoint source reductions. The two scenarios modeled were implementation of filter strips in four high sediment load subwatersheds and conversion of land in the potato/soybean rotation to grass through participation in CRP. Load reductions were achieved through both scenarios although the second scenario did not achieve reductions as high as those achieved in the first scenario.

U.S. EPA finds that this section has been adequately addressed in the TMDLs.

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, particularly when a TMDL involves both point and non-point sources, and the WLA is based on an assumption that non-point source load reductions will occur. Such a TMDL should provide assurances that non-point source controls will achieve expected load reductions and, such TMDL should include a monitoring plan that describes the additional data to be collected to determine if the load reductions provided for in the TMDL are occurring and leading to attainment of water quality standards.

Comments:
Monitoring is necessary to determine whether sufficient progress is being made toward attaining WQS. The TMDL study suggests monitoring at the beginning and end of listed reaches in addition to monitoring at the mouths of the main tributaries. Monitoring is also suggested at the confluence of Long Prairie River with the Crow Wing River to measure the cumulative effect of all sources entering the river. The TMDL study suggests that monitoring include DO, flow, and sources and loadings of CBOD, NH_3-N, and other nutrients. The TMDL study suggests that WWTF permits should include a schedule for monitoring effluent for pH, temperature, and NH_3-N.

U.S. EPA finds that this section has been adequately addressed in the TMDLs, although U.S. EPA is not approving these recommendations for monitoring or any other aspect of Minnesota's monitoring program through this decision.

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[1] The Conservation Reserve Program reduces soil erosion, protects the Nation's ability to produce food and fiber, reduces sedimentation in streams and lakes, improves water quality, establishes wildlife habitat, and enhances forest and wetland resources. It encourages farmers to convert highly erodible cropland or other environmentally sensitive acreage to vegetative cover, such as tame or native grasses, wildlife plantings, trees, filterstrips, or riparian buffers. Farmers receive an annual rental payment for the term of the multi-year contract.

10. Implementation

U.S. EPA policy encourages Regions to work in partnership with States/Tribes to achieve non-point source load allocations established for 303(d)-listed waters impaired by non-point sources. Regions may assist States/Tribes in developing implementation plans that include reasonable assurances that non-point source LAs established in TMDLs for waters impaired solely or primarily by non-point 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.

Comments:
Section 12 of the TMDL study presents some implementation alternatives for resolving the water quality problems associated with low dissolved oxygen in the Long Prairie River watershed. Two implementation alternatives were considered for point sources: improved treatment and restricting discharges to periods of higher flows. Implementation alternative discussions for nonpoint sources considered various BMPs and support for continuation of existing programs. Specific consideration was also given to the uppermost portion of reach 506, commonly referred to as the Carlos Reach. Lingering effects of historical point sources were considered as possible sources initially. However the TMDL study demonstrated that low dissolved oxygen persists in this reach due to natural interaction with the riparian wetland. Low dissolved oxygen conditions exist in this portion of the reach during high flow conditions and without any point sources.

It is common practice in Minnesota to develop an implementation plan after a TMDL has been approved by U.S. EPA, usually within about one year after TMDL approval. Specific details of necessary implementation efforts are usually addressed in such a plan. In the cover letter submitting the final TMDL for USEPA review and approval the state indicated that implementation planning has begun. The state also provided two internal MPCA memorandums which relate to implementation efforts specifically for Central Lakes Regional Sanitary District (CLRSD) and the Carlos Reach.

U.S. EPA finds that this section has been adequately addressed in the TMDLs and supplemental documents. U.S. EPA is not, however, required to and does not approve TMDL implementation plans. This decision is not an approval of any recommendations for implementation.

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 C.F.R. §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. When U.S. EPA establishes a TMDL, U.S. EPA regulations require U.S. 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 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.

Comments:
The Long Prairie River TMDLs were initially public noticed from July 18 to August 18, 2003. Two public meetings were held prior to the public notice; May 22 and June 12, 2003. The public was made aware of these public meetings and public notice through local press releases to local media outlets and letters of invitation to interested parties. In an August 26, 2003 correspondence the state provided to U.S. EPA copies of the press releases, letter of invitation, the mailing list of interested parties which were sent the letter of invitation, and copies of the written public comment letters received during the July 18 to August 18 public comment period. This information is also included in Appendix H of the final TMDL study. Twelve written public comment letters were submitted to the state during the 2003 public notice period. On October 17, 2003 the state mailed to interested parties a responsiveness summary to the public comments received and informed the interested parties that a contested case hearing was requested. The State provided a copy of the October 17, 2003 responsiveness summary to U.S. EPA in Appendix H of the final TMDL study. Two of the commentors, ALASD and Central Lakes Region Joint Powers Board (CLRJPB), petitioned the state for a contested case hearing pursuant to Minnesota Rule 7000.1800. During the latter part of 2003 and into 2004 the state worked with the two petitioners to address their concerns. The state has provided copies of the various documents and correspondences tracking the efforts made to resolve the contested case hearing petitions. The final TMDL submittal from the state also includes a responsiveness summary addressing the written comments received except those raised by the petitioners.

In efforts to resolve concerns raised by the petitioners, the state conducted additional technical review and modeling. A change to the reaeration rate coefficient values in model simulations impacted the original TMDLs. Therefore, from July 22 to August 23, 2004 the modified version of the TMDL was on public notice. On July 22, 2004 the state issued a letter to local media outlets announcing the public notice. Additionally, a nine page document describing the modifications and new allocations was made available on the state's website, through mailings to a mailing list of interested parties, and was provided to U.S. EPA in Appendix H of the final TMDL study. The state has provided the mailing list and list of local media outlets, both of which are very similar to the list of media outlets and mailing list used for the 2003 public notice. The state received one electronic mail comment during the public notice period supporting the TMDL and encouraging implementation efforts to get underway. No written comments were received and no petitions for contested case hearings were received.

On April 8, 2005 and May 23, 2005 ALSAD and CLRSD withdrew their petitions for contested case hearings, respectively.

U.S. EPA finds that the TMDLs and supporting documents submitted by the State of Minnesota for the Long Prairie River Watershed satisfy the 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 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 waterbody, and the pollutant(s) of concern.

Comments:
A transmittal letter submitting the final TMDL to USEPA was dated July 5, 2005 and received by the Watersheds & Wetlands Branch, Water Division, USEPA, R5 on July 8, 2005. The transmittal letter explicitly states that the final Long Prairie River Watershed Total Maximum Daily Load for dissolved oxygen is being submitted to USEPA pursuant to Section 303(d) of the Clean Water Act for USEPA review and approval. The transmittal letter does not state the specific impaired reaches being addressed nor does the transmittal letter identify the pollutant of concern receiving allocations in the TMDL study. However, the transmittal letter does identify the watershed and the impairment, Long Prairie River and low dissolved oxygen, respectively. Specific identification of impaired reaches and pollutants of concern are clearly identified in the executive summary, among other places, in the TMDL study.

U.S. EPA finds that the TMDL transmittal letter submitted by Minnesota reasonably satisfies the requirements of this twelfth element.

13. Conclusion

After a full and complete review, U.S. EPA finds that the TMDL for Long Prairie River watershed, satisfies the elements of an approvable TMDL. This approval is for six (6) impaired reaches of the Long Prairie River impaired by low dissolved oxygen as identified on Minnesota's 2004 303(d) list. Each of the six reaches have received allocations for three pollutants of concern for a total of 18 TMDLs addressing 6 impairments.

Impaired Reach Name	Assessment Unit ID	Impairment	CBOD TMDL (lbs/day)	NBOD TMDL (lbs/day)	[illegible]
Long Prairie River; Fish Trap Creek to Crow Wing River	07010108-501	low dissolved oxygen	2,106	529	545
Long Prairie River; Moran Creek to Fish Trap Creek	07010108-502	low dissolved oxygen	1,356	401	252
Long Prairie River; Turtle Creek to Moran Creek	07010108-503	low dissolved oxygen	1,884	582	120
Long Prairie River; Eagle Creek to Turtle Creek	07010108-504	low dissolved oxygen	3,406	928	315
Long Prairie River; Spruce Creek to Eagle Creek	07010108-505	low dissolved oxygen	7,239	2,070	1,750
Long Prairie River; Headwaters (Lake Carlos) to Spruce Creek	07010108-506	low dissolved oxygen	1,657	432	291

U.S. EPA's approval of the Long Prairie River Watershed TMDLs extends to the waterbodies which are identified in this decision document and the TMDL study with the exception of any portions of the waterbodies that are within Indian Country, as defined in 18 U.S.C. Section 1151. U.S. EPA is taking no action to approve or disapprove the State's TMDL with respect to those portions of the waters at this time. U.S. EPA, or eligible Indian Tribes, as appropriate, will retain responsibilities under Section 303(d) for those waters.

Table 4-1

Minnesota Pollution Control Agency
Long Prairie River Watershed TMDL Final Project Report

Known Point Source Inventory

Facility Name	NPDES Permit Number	Discharge	Description
Municipal Waste Water Treatment Facilities (WWTFs):			
Alexandria Lake Area Sanitary District	MN0040738	SD-010	Discharges into the Lake Carlos chain of lakes
City of Carlos WWTF	MNG580005	SD-001	Total Facility Discharge of Effluent to Surface Water
		SD-002	Bypass
City of Long Prairie WWTF	MN0020303	SD-001	Industrial Discharge, serving Central By-Products SC, of Effluent to Surface Water
		SD-002	Combined domestic and industrial Discharge of Effluent to Surface Water
		SD-003	Domestic Discharge of Effluent to Surface Water
		SD-005	Discharge of drain-tile under holding pond #3 to catch groundwater, not treated.
City of Long Prairie WWTF	MN0066079	SD-001	Continuous Discharge of Effluent to Surface Water (proposed facility to replace Domestic Pond Discharge when operational)
City of Browerville WWTF	MN0022926	SD-001	Total Facility Discharge of Effluent to Surface Water
City of Clarissa WWTF	MNG580006	SD-001	Total Facility Discharge of Effluent to Surface Water
City of Eagle Bend WWTF	MN0023248	SD-001	Facility Lift Station Bypass Discharge of Effluent to Surface Water
		SD-002	Total Facility Discharge of Effluent to Surface Water
City of Miltona WWTF	MN0024155	SD-010	Existing facility
		SD-020	Overflow
		SD-030	(proposed facility to replace SD-010 when operational)
Treated Groundwater Discharge:			
Long Prairie Superfund Site	MND980904072	---	Discharges treated groundwater into the Long Prairie River at Long Prairie
Potential Source:			
Former meat packing plant, Carlos	---	---	Opened in 1858; installation of sanitary sewer in 1968 indicates that high-oxygen demand effluent from the plant may have discharged to wetland for 110 years.
Confined Animal Feedlot Operations (CAFOs):			
Steve Woge	MNG440181	---	No discharge to surface water. Location T131 R34 S2 (Eagle Creek subwatershed). 80,000 turkeys over 5 pounds (1440 AU).
Jennie-O Turkey Store - Toddco Blue	MNG440238	---	No discharge to surface water. Location T131 R34 S36 (Eagle Creek subwatershed). 69,600 turkeys over 5 pounds (1252.8 AU).
Jennie-O Turkey Store - Toddco Green	MNG440235	---	No discharge to surface water. Location T130 R33 S6 (Eagle Creek subwatershed). 55,575 turkeys over 5 pounds; 58,500 turkeys under 5 pounds (1292.85 AU).
Long Prairie Packing, Long Prairie	In process	---	No discharge to surface water. Location T129 R33 S17 (main stem subwatershed).
Ridgeway Enterprises	MNG440407	---	No discharge to surface water. Location T129 R33 S33 (Turtle Creek subwatershed). 945 dairy cattle (1323 AU).

Source: MPCA and Todd SWCD

Table 11-2

Minnesota Pollution Control Agency
Long Prairie River Watershed TMDL Final Project Report

Long Prairie River DO TMDLs

Reach 07010108-506: Long Prairie River Headwaters (Lake Carlos) to Spruce Creek

Unallocated Capacity	147	42	n/a	189
WLA + MOS for Carlos WWTF	233	254	n/a	487
LA for LPR Headwaters @ RM89.9	161	55	n/a	216
LA for other Nonpoint Sources	***999***	***68***	291	1,359
MOS for all Nonpoint Sources	116	12	n/a	128
Total Maximum Daily Load	1,657	432	291	**2,380**

Reach 07010108-505: Spruce Creek to Eagle Creek

Unallocated Capacity	397	114	n/a	511
WLA + MOS for LP-Superfund	48	17	n/a	65
WLA + MOS for Long Prairie WWTF	***275***	***838***	n/a	1,114
WLA + MOS for Browerville WWTF	542	***504***	n/a	1,045
LA for Spruce Creek	***87***	***29***	n/a	116
LA for Dismal Creek	***17***	***30***	n/a	47
LA for other Nonpoint Sources	***5,329***	***484***	1,750	7,563
MOS for all Nonpoint Sources	543	54	n/a	598
Total Maximum Daily Load	7,239	2,070	1,750	**11,059**

Reach 07010108-504: Eagle Creek to Turtle Creek

Unallocated Capacity	971	278	n/a	1,249
Eagle Creek Residual Point Source Loads	204	209	n/a	412
LA for Eagle Creek	***587***	***40***	n/a	626
LA for other Nonpoint Sources	***1,442***	***362***	315	2,119
MOS for all Nonpoint Sources	203	40	n/a	243
Total Maximum Daily Load	3,406	928	315	**4,649**

Reach 07010108-503: Turtle Creek To Moran Creek

Unallocated Capacity	941	269	n/a	1,210
LA for Turtle Creek	238	129	n/a	367
LA for other Nonpoint Sources	620	156	120	895
MOS for all Nonpoint Sources	86	28	n/a	114
Total Maximum Daily Load	1,884	582	120	**2,587**

Reach 07010108-502: Moran Creek To Fish Trap Creek

Unallocated Capacity	504	144	n/a	648
LA for Moran Creek	93	62	n/a	155
LA for other Nonpoint Sources	682	171	252	1104
MOS for all Nonpoint Sources	77	23	n/a	101
Total Maximum Daily Load	1,356	401	252	**2,008**

Reach 07010108-501: Fish Trap Creek to Crow Wing River

Unallocated Capacity	435	124	n/a	559
LA for Fish Trap Creek	243	48	n/a	291
LA for other Nonpoint Sources	1,276	320	545	2,142
MOS for all Nonpoint Sources	152	37	n/a	189
Total Maximum Daily Load	2,106	529	545	**3,180**

Notes:
Bold italic denotes a load that was reduced to meet DO standard