

Minnesota Pollution Control Agency

Responses to the 2016 Draft Impaired Waters List Public Notice Comments

January 4, 2017

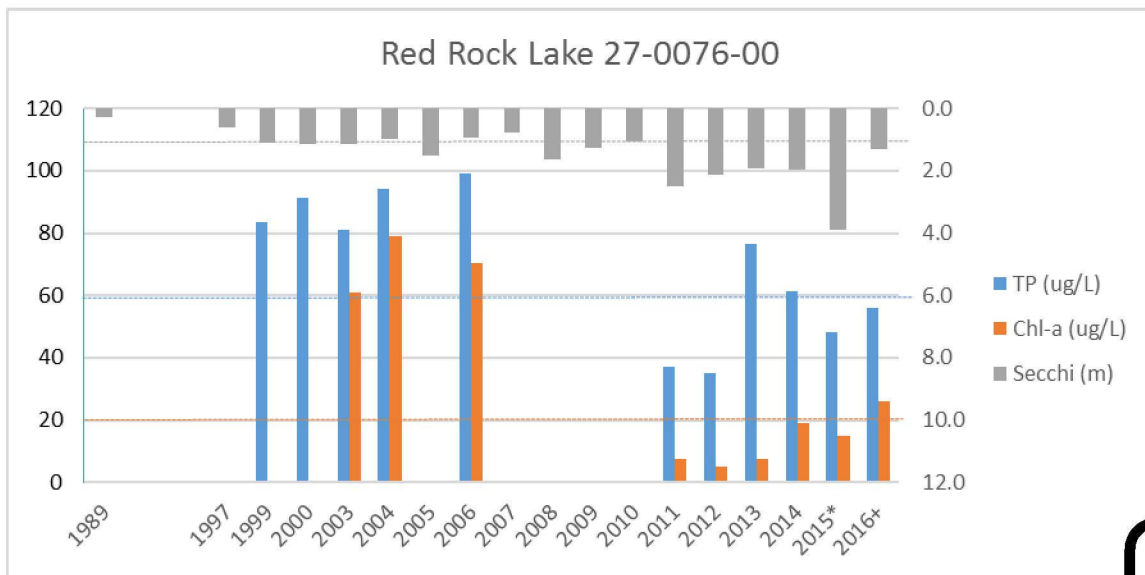
The 2016 Draft Impaired Waters List comment period began on August 1, 2016 and ended on September 30, 2016. Listed below are the comments received and the responses given by the Minnesota Pollution Control Agency (MPCA). These responses and the unabridged comments are posted online on the MPCA Impaired Waters List website at <https://www.pca.state.mn.us/water/minnesotas-impaired-waters-list>. See the same website for the 2016 Proposed Impaired Waters List and the 2016 Guidance Manual for Assessing the Quality of Minnesota’s Surface Waters for Determination of Impairment: 305(b) Report and 303(d) List, referenced in this document.

Comment 1: Add Lake Addie, 43-0061-00, to the Impaired Waters List for nutrients and mercury.

Lake Addie in Brownton (AUID 43-0061-00) does not have a public access and has not had water quality data collected on it for nutrients or mercury. Because water quality data has not been collected, Lake Addie cannot be listed as impaired. The MPCA does have a volunteer water quality monitoring program, Citizen Lake Monitoring Program, which would allow for transparency measurements to be collected, and does provide the opportunity for advanced monitoring after a year of successful transparency monitoring. More information, including how to enroll, is available at: <https://www.pca.state.mn.us/water/citizen-lake-monitoring-program>.

Comments 2, 5, 8, 11, 13, 14, 15, 16, 22, 29, 34, 37, and 43: Do not remove Red Rock Lake, 27-0076-00, from the Impaired Waters List for nutrients.

Red Rock Lake (AUID 27-0076-00) was assessed in the Spring of 2016. Local data for 2015 was not included, as it was not reviewed by the local data provider in time for assessments. Since, some 2016 data was provided during the public comment period by Friends of Red Rock Lake. The analysis that follows includes the draft 2015 and draft 2016 data (full dataset requested and received from the City of Eden Prairie in November 2016). An overall review of the dataset appears to show a period of years with poor water quality which then shifted to a period of relatively good water quality. A chart of existing data follows. The water quality standards for each parameter are included as dashed lines. Note that 2015 and 2016 data are preliminary. As can be seen in the graphs, the available data from Red Rock Lake show that from 2011 to 2016 the eutrophication standard was met in most years.



wq-iw1-55g

Exhibit
3682

State of Minnesota v. 3M Co.,
Court File No. 27-CV-10-28862

The MPCA employs the lake eutrophication standard to determine if aquatic recreation use is supported, which protects aesthetics and swimming in a lake by reducing the likelihood and potential longevity of nuisance algal blooms. The standard involves total phosphorus (TP) as a causative variable and either chlorophyll-*a* (a direct measure of algae) or Secchi transparency (an indirect measure of algae) as the response. The methodology for the assessment uses data from across the lake; data for this lake was collected from a mid-lake location. The mid-lake location is not a requirement; should data be provided from across other locations on the lake, they would be used. The data period used for assessment is June to September, averaged across a 10-year window.

The standard does not protect against rooted vegetative growth; it protects against nuisance algae blooms. The eutrophication standard is also not protective of navigation or fishing uses. Regulations involving management of aquatic vegetation and fisheries management are handled by the Minnesota Department of Natural Resources (<http://www.dnr.state.mn.us/fisheries/management/index.html>). Other water quality standards also protect for aquatic life, including healthy fish communities, such as the chloride standard.

Commenters expressed concerns over a variety of aquatic recreation issues. The lake eutrophication aquatic recreation standard does not protect against fish kills due to a malfunctioning bubbler and vegetation decay, issues pertaining to stocking of fish and successful propagation of game fish, growth of coontail (a naturally occurring plant in Minnesota waters or other plants that may impact navigation) or fluctuating water levels due to rainfall events or drought. While all these things do impact recreation, they do not fall under what the lake eutrophication water quality standard protects. The MPCA also employs biological monitoring to assess the health of aquatic life in lakes. Red Rock Lake was sampled by the Department of Natural Resources for fish in 2006. However, the index of biological integrity (IBI) for fish, which the MPCA uses to determine aquatic life use support, is not appropriate for lakes, such as Red Rock Lake because they experience winterkills.

Explaining exactly why water quality has improved is difficult for a shallow lake since such waterbodies exhibit various interdependent ecological features. Improvements may be related to runoff reductions, stormwater management, in-lake invasive aquatic plant management, and/or winterkills (which may have included rough fish species). However, per the MPCA's 2016 Guidance Manual, the primary basis for removing a waterbody from the Impaired Waters List is that sufficient data have been collected to show that water quality meets standards. Waters are removed each cycle because new data indicate that the water quality standard is being met.

Red Rock Lake was originally listed in 2002 as impaired for aquatic recreation due to eutrophication. The lake is in the North Central Hardwood Forest Shallow Lake ecoregion, where the current lake eutrophication standard is: TP less than 60 µg/L, chlorophyll-*a* less than 20 µg/L, and Secchi transparency greater than 1.0 meter over a 10-year period, June to September. The most recent 10-year dataset indicates that the water quality is meeting the lake eutrophication standard, on average, and therefore is eligible for a removal from the Impaired Waters List.

Data	Total phosphorus (µg/L)	Chlorophyll- <i>a</i> (µg/L)	Secchi (meters)
NCHF Shallow Lake Standard	< 60	< 20	> 1.0
Red Rock Lake 1991-2000 listing data	87	59.9	1.1
Red Rock Lake 2007-2016 delisting data	48	15.6	2.0

It is not appropriate to keep Red Rock Lake on the Impaired Waters List for lake eutrophication; it meets the water quality standard. While the commenters raised concerns about recreational opportunities on the lake, native plant growth, fish kills, and fluctuating water levels are all natural processes in shallow lakes. Some management can be done to mitigate these, but it must be done through local ordinances, management, etc. Funds are available for both restoration and protection activities in Minnesota.

Comment 3: Do not list the Redwood River, 07020006-501, for nutrients.

a) How many other dischargers are upstream of this reach that have had reductions in discharges?

Reduction in discharge is not a part of water quality assessments and determination of impairment. Impairment is determined by comparing the water quality measured in the river against the river eutrophication standard adopted to protect aquatic life.

b) Has the MPCA taken these recent reductions into account?

The MPCA compares recent water quality data to the standard to determine if an impairment exists. MPCA's analysis of the available data from the most recent 10-year period shows that the river is not meeting the river eutrophication standard. The commenter indicated reductions in discharge met permit limits in January 2016. The data window for the 2015 assessment of the Redwood River was October 1, 2004 to September 30, 2014. The new reductions from the facility were implemented after the assessment.

c) Do these recent reductions warrant additional phosphorus and chlorophyll-*a* monitoring and assessment to verify an impairment still exists?

Additional phosphorus and chlorophyll-*a* monitoring is scheduled to occur on this reach in 2017 and 2018, with another assessment occurring in 2019. This will measure if reductions that have occurred since 2016 have lowered phosphorus and chlorophyll-*a* concentrations below the water quality standard.

d) Data collection is out of date and does not reflect the current health of the Redwood River.

The MPCA uses any and all available data that meets data quality thresholds established by U.S. Environmental Protection Agency (EPA), for the purposes of water quality assessments. The 2015 statewide assessment for river eutrophication utilized data in MPCA's EQuIS and from external sources such as EPA STORET, USGS, and Metropolitan Council. The most recent 10 years of data were used – October 1, 2004 to September 30, 2014. This is consistent with the 2016 Guidance Manual (<https://www.pca.state.mn.us/sites/default/files/wq-iw1-04i.pdf>, page 16). A general call for data was made in September 2014 requesting that parties with water quality data they wanted used for assessment submit their data to the MPCA by November 3, 2014 so it would be included in assessments.

More data are needed to determine if reductions that have occurred since 2016 have lowered phosphorus and chlorophyll-*a* concentrations below the water quality standard. As the MPCA completes assessments on a rotating watershed basis, monitoring in the Redwood River Watershed will begin in 2017. New data will be collected at S000-299, a station along 07020006-501, to refresh the river eutrophication assessment. A new assessment will be completed spring of 2019.

Comment 4: List water bodies impaired for contaminants of emerging concern. Report and make public likely sources of pollutants.

The MPCA is doing a good deal of work in investigating contaminants of emerging concern (CECs), (see <https://www.pca.state.mn.us/water/pollutants-and-emerging-concerns>), but does not list them because

there are no water quality standards to determine impairment. While it is apparent that multiple CECs are detected in many of Minnesota's aquatic environments, it is difficult to describe the ecological risks associated with these contaminants because there are very few risk-based screening values, and no water quality standards, at the state or federal level that can be used to provide context to the occurrence data. MPCA is in the process of developing risk-based screening values for some CEC, called aquatic life screening values (ALSVs). The rationale for the methods, and the expected and appropriate uses of ALSVs, is available in the following report: <https://www.pca.state.mn.us/sites/default/files/wq-cec2-01.pdf>. It is important to note that ALSVs are not standards and therefore would not be used as the basis for listing waters as impaired. However, ALSVs can help MPCA and others interpret CEC data and prioritize CECs for future standard development.

Regarding pollutant sources, Minnesota's Impaired Waters List is only the first step in the process. After a water body appears on the Impaired Waters List, then we must set pollutant-reduction goals needed to restore impaired waters, called the total maximum daily load (TMDL). It is through the TMDL process that sources of pollution contributing to impairments are identified. TMDL reports can be found on here: <https://www.pca.state.mn.us/water/total-maximum-daily-load-tmdl-projects>. In addition, any data the MPCA collects on contaminated sites, stormwater, and lakes and streams are available public. See the webpage <https://www.pca.state.mn.us/data/surface-water-and-stormwater-data>. MPCA also provides information about potential pollution sources via reports like "How's the Water?" (see <https://www.pca.state.mn.us/water/how-water>).

Comments 6, 10, 12, 17, 32, and 39: The MPCA needs to expedite the mercury TMDL for the Lake Superior basin.

The MPCA is concerned about the levels of mercury in all of Minnesota's waters. The MPCA is committed to continuing our work to implement the statewide mercury TMDL to control mercury releases in Minnesota. In 2007 MPCA completed a statewide mercury TMDL that determined that human-caused, air-deposited mercury from state, federal and global sources must be reduced by 93% from 1990 levels to reduce mercury concentrations in fish so that eventually fish caught in Minnesota are safe to eat and mercury fish consumption advisories may be removed. Together with stakeholders, MPCA developed a plan to reduce the mercury emitted by Minnesota smokestacks and discharge pipes to achieve the TMDL goals. The plan, finalized in 2009, includes:

- Water Implementation Strategies to ensure that total statewide mercury discharges remain below 24 lb/yr. This includes a permitting strategy for addressing mercury water permits.
- Air Implementation Strategies to achieve reductions from existing sources to below 789 lb. by 2025, as well as guidelines for minimizing emissions from potential new and modified sources.
- A Monitoring and Evaluation Plan for tracking the effectiveness of implementation including monitoring releases to air and water as well as tracking key environmental response indicators.

Minnesota is on track to meet the TMDL goals for air emissions and water discharge, and is making progress addressing the purposeful use of mercury in products.

While the statewide mercury TMDL will reduce mercury concentrations in all Minnesota waters, for about 10% of Minnesota waters the 93% reduction called for by the TMDL is not expected to fully achieve the fish tissue mercury standard. This includes the St. Louis River. It is unclear whether additional mercury reductions will address the remaining impairment or whether changes to other factors like sediment conditions, sulfate, temperature, organic matter, etc. are needed to reduce the availability of mercury to the food web. This information is needed to complete the additional TMDLs that are necessary for the 10% of Minnesota waters that will not be fully restored by a 93% reduction in mercury deposition. Collecting the needed information and completing those TMDLs will take time. MPCA is currently in the process of collecting the needed information (see next response).

Comments 6, 10, 12, 17, 32, and 39: The MPCA disrupted and stopped the St. Louis River mercury TMDL process in 2013; request that the process resume and be completed by 2019.

The MPCA is concerned about the levels of mercury in the St. Louis River. Although significant mercury emission and discharge reductions that benefit all waters are being made under the existing statewide TMDL and water quality standard, the St. Louis River is one of the 10% of state waters where the mercury problem will not be fully solved by the statewide TMDL. In these waters, mercury is more available to the food chain, resulting in higher levels of mercury in fish tissue. In 2013, the MPCA identified the need for further research into mercury loading, mercury methylation, and bioaccumulation of mercury in fish tissue. This information is needed to fully understand the situation in the St. Louis River, and therefore to complete and implement a scientifically sound mercury TMDL for the River. MPCA has begun the relevant research, and it is expected to be complete in June 2017 and then to be available to guide the next steps to further reduce mercury in fish in the St. Louis River. The MPCA plans to resume the St Louis River mercury TMDL process once this additional research is completed. MPCA continues to work with the partners in the St. Louis River TMDL effort to gather and share information in preparation for a future TMDL.

Comments 6, 10, 12, 17, 19, 32, 39, and 40: Commenters note that in 2012 the MPCA was planning to develop an assessment methodology for determining “water used for the production of wild rice” and assessing those against the 10 mg/L sulfate level.

In the 2014 Impaired Waters List submittal, the MPCA noted the need for additional time to develop a wild rice assessment methodology in light of the data and analysis from the Wild Rice Sulfate Standard study. This study and other review of the existing sulfate standard to protect wild rice has shown the need to refine the standard. The MPCA is currently in the midst of this effort, with a legislatively mandated deadline of January 2018. All wild rice waters will be listed in rule. Because the same staff that would develop the assessment methodology are working on the wild rice standard study and rulemaking, including developing the sediment sampling methodology, the MPCA has not finalized methods for assessing impairment of waters based on a wild rice-related standard. Consequently, the 2016 Draft Impaired Waters List does not include any waters assessed as impaired for the sulfate wild rice standard. The MPCA is committed to assessing waters for a wild rice-related standard once the rulemaking is complete. Once the standard revision rulemaking is complete, MPCA staff will work on methods for assessment of waters for the wild rice sulfate standard.

Comment 7: Request to classify Rogers Lake, 02-0104-00, as a wetland and remove from the 2016 Impaired Waters List.

The MPCA received a request to review Rogers Lake (AUID 02-0104-00) to determine if it met the definition of a shallow lake or that of a wetland. Data provided by the commenter was consistent with data recommended in Appendix D of the 2016 Guidance Manual for lake and wetland differentiation. Aerial imagery and on site photos clearly indicate a lack of open water on this basin. Shallow depth, dense emergent vegetation along shorelines, and lack of a reproducing game fishery also indicate the basin is indicative of a wetland. Local use and perception of the basin is that of a wetland; utilized for visual aesthetics and occasional boating, when vegetation senesces.

Based on data available since the 2006 listing, the MPCA agrees that the basin is functioning as a wetland and will remove 02-0104-00 from the 2016 Impaired Waters List for nutrients.

Comment 9: Do not list the Cannon River, 07040002-501 and 07040002-540, for nutrients; data used as the basis for the impairment is not reflective of the current conditions.

The MPCA uses any and all available data that meets data quality thresholds established by EPA for the purposes of water quality assessments. The 2015 statewide assessment for river eutrophication utilized

data in MPCA's EQiS and from external sources such as EPA STORET, USGS, and Metropolitan Council. The most recent 10 years of data were used – October 1, 2004 to September 30, 2014. This is consistent with the 2016 Guidance Manual (<https://www.pca.state.mn.us/sites/default/files/wq-iw1-04i.pdf>, page 16). A general call for data was made in September 2014 requesting that parties with water quality data they wanted used for assessment submit their data to the MPCA by November 3, 2014 so it would be included in assessments.

MPCA agrees that data used in the 2015 assessment are from before the facility upgrades for Owatonna, Faribault, and Northfield. Point source discharges are not the only source of nutrients in the watershed and, based on available data, the reaches are exceeding the river eutrophication standards. The TMDL will determine appropriate waste load allocations for facilities that takes into account reduced discharges of phosphorus.

Should interested parties have data to submit in the interim, an annual call for data is made via a GovDelivery email distribution list and through MPCA's Waterfront Bulletin. The call for data is made in September prior to the start of assessments in January. Working with MPCA staff, a request can be submitted each year for waterbodies to be assessed outside of our rotating watershed approach. Also, each October a call for recategorization requests (corrections or delistings) goes to MPCA Watershed Project Managers. They, in turn, work with local parties to find impaired water bodies with new data that may indicate they could be removed from the Impaired Waters List.

Comments 18 and 41: There is an inconsistency in displaying and counting new impairments.

The number of waterbodies added to the 2016 Draft Impaired Waters List was 313. The numbers referenced by Commenter 41 come from two different parts of the 2016 Draft Impaired Waters List spreadsheet. 313 comes from the "2016 Inventory of Impaired Waters" tab, while 324 (we found 324, not 321) come from the "New to 2016 Inventory" tab. The difference between the two lists is that the "2016 Inventory of Impaired Waters" counts all impairments that have a "year first listed" to be 2016; the "New to 2016 Inventory" tab counts any Assessment Unit Identifier (AUID) that is new to the Impaired Waters List. An AUID is a number for a water body which can change based on splits, merges, or bays. There were 11 impairments in the "New to 2016 Inventory" tab that were on the 2014 Impaired Waters List but with different identifiers (AUIDs). That makes the difference between these two numbers. (Note that these numbers have changed since the public comment period ended.) We understand the confusion and plan to remove the "New to" tabs from the 2018 Impaired Waters List. Instead the public will view new impairments in the "2018 Inventory of Impaired Waters" tab.

Comment 18: Many (or, perhaps, most) of the new listings are the result of increased data collection efforts.

We agree. The large number of impairments the MPCA has been adding to its Impaired Waters List every two years have a lot to do with the fact there's more data and sampling in new places. This point was made briefly in the press release: "Minnesota is detecting more waters in trouble because of its 10-year plan to study all 80 major watersheds in the state, funded by the Clean Water, Land and Legacy Amendment." The point was further emphasized in the public meetings.

Comment 18: It would be helpful if the assessment process could regain the transparency that it once provided to local units of government and stakeholders.

The MPCA values transparency and strives to conduct the assessment process in a manner that reflects this value. The assessment process includes holding a meeting with resource managers from each of the watersheds being assessed to discuss the draft assessments; this meeting is called the professional judgment group meeting (PJG). For example, in the Red Lake River and Grand Marais Creek PJG meetings,

the MPCA provided maps of draft impairments and reports of preliminary assessments to all attendees three weeks in advance of the meeting. Assessment statistics were a static screen shot of a summary string (our new system does not support that in a report) and were available at the meeting. Each new impairment is reviewed at the meeting. There is an opportunity to look at the summaries and the raw data. Since the 2015 PJG meetings, we have expanded our reporting-out capabilities to include individual parameter level judgements and additional comments. Raw data can also be exported at this time. Our new reports are easier to search and provide comparable information and additional reporting options (i.e. raw data). The MPCA has always provided an updated Guidance Manual with the release of the Draft Impaired Waters List. A discussion of new parameters and how they were assessed is also included in the PJG meeting, as they precede the release of the Impaired Water List and Guidance Manual. The MPCA also holds public meetings around the state to discuss the Draft Impaired Waters List while it is on public comment, posts information on the MPCA webpage and accepts public comments during a minimum of a 30-day public comment period. Comments pertaining to MPCA watershed reporting will not be addressed with Impaired Waters List comments.

Comment 18: Commenter requests clarification on the application of river eutrophication standards.

The MPCA has updated its 2016 Guidance Manual for river eutrophication assessment to provide more clarity. If biochemical oxygen demand (BOD₅) or diel dissolved oxygen (DO) flux data is in sufficient quantity and quality, and was collected during representative conditions, it is used for river eutrophication assessments – there is no requirement that chlorophyll-*a* data be present. Chlorophyll-*a* and pH are by far the largest datasets we have in Minnesota for river eutrophication response variables. Detection limits can be problematic for BOD₅ and sonde deployments to measure DO are sporadic – these considerations are taken into account when the MPCA determines if the available data are representative of the river reach and therefore appropriate to be used for assessment purposes. BOD₅ and DO datasets are much smaller across Minnesota as a whole. The MPCA has a method for periphyton sampling and conducts periphyton sampling where appropriate substrate exists.

Comment 18: A new category for nearly-impaired water bodies could help prioritize reaches that are in need of extra protection efforts in order to avoid future impairments.

The MPCA has been developing two methods for identifying waters for protection. During the assessment process, including public meetings, there is the ability to note that a waterbody is high priority for protection. Reasons for this could be connectivity to water bodies with existing impairments, cases where chemistry or biology data are nearing standards, or scenarios where the biology looks good but there a chemical parameter is nearing the standard. This list of waterbodies with a high priority for protection is a part of the export report from the assessment database, and is provided for planning purposes in the Watershed Restoration and Protection Strategies (WRAPs). The MPCA also has a stream protection and prioritization project underway, in conjunction with Department of Natural Resources, to develop a list of priority waters within a watershed for protection efforts. This will also help to address the need for prioritizing water quality work for local planning.

Comments 18 and 42: Commenter remarked on issues specific to a number of AUIDs.

See Appendix B.

Comments 19, 24, and 40: Commenters raise concerns that the MPCA's 2016 Draft Impaired Waters List does not include waterbodies that exceed the narrative water quality standards for "nitrate caused aquatic toxicity."

The narrative nitrate standard focuses on the health of the biotic community. As part of our assessment process, the MPCA uses indices of biological integrity (IBIs) to directly assess the condition of the aquatic biology in Minnesota waterbodies. Some waterbodies are identified as impaired without reference to a

specific pollutant, because of a bioassessment of the fish or bugs; in these cases, the waterbodies are not showing the expected healthy assemblages of aquatic life. The IBIs include descriptions of types of biological assemblages that help indicate where nitrate is a stressor on the aquatic life. The MPCA believes our bioassessment protocols appropriately indicate aquatic life concerns for all pollutants.

While the MPCA has provided technical documentation of potential draft numeric water quality criteria for nitrate to protect aquatic life, those numbers have not gone through Minnesota's rulemaking process or EPA approval to become water quality standards. They are also likely in need of modification pending the completion of EPA-sponsored nitrate toxicity testing that is underway. It would be inappropriate and legally unsound to use draft unpromulgated values for listing waters as impaired.

Comment 20: Request to remove Buffalo Creek, 07010205-638, from the 2016 Impaired Waters List for nutrients.

During the public comment period for the 2016 Draft Impaired Waters List it was discovered that this reach, Buffalo Creek (AUID 07010205-638), was added to the List in error. Statistical analysis indicated that the chlorophyll-*a* exceeded the 35 µg/L threshold. However, the promulgated standard for chlorophyll-*a* for 2B waters in the Southern Nutrient Region is 40 µg/L while Class 2A and 2Bd waters have a 35 µg/L chlorophyll-*a* threshold. As a result, this reach is not exhibiting a sufficient response to be considered impaired for river eutrophication. The BOD₅ data and DO flux deployments may not have been representative of the creek conditions due impacts from mixing zones from effluent discharges; as a result, those data were not used in the assessment. This draft impairment was removed from the Impaired Waters List after the close of the public comment period.

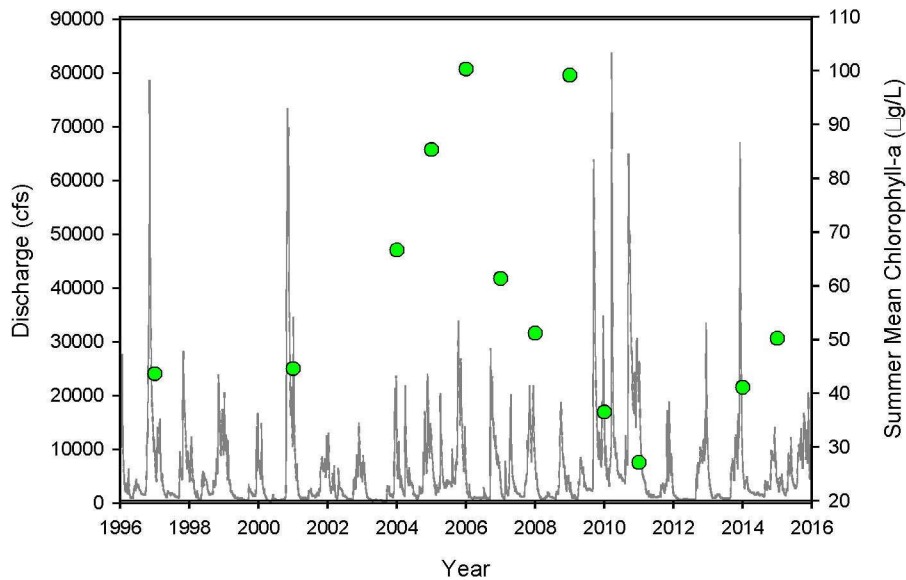
Comment 21: The nutrient impairment listing for the Minnesota River below Mankato, 07020007-501 and 07020012-503, should be withdrawn from the 2016 Impaired Waters List; data are insufficient to make any type of impairment determination.

The comments are based on a data analysis approach that is inconsistent with how the standard was adopted and is applied. Choosing to include data only from conditions relevant to point sources (i.e., low flow years) does not demonstrate attainment of the standard. When the data are analyzed at the appropriate resolution (i.e., the 10-year assessment period), impairment is clearly demonstrated on these reaches.

a) Impairment listings must be based on current data

The use of a 10-year window is the standard time period recommended by EPA and used by the MPCA in assessments; it is the time period used for the river eutrophication standards (RES). The 10-year time period is important for the RES standard to document conditions over different flow and weather conditions. The standard time period is documented in MPCA's 2016 Guidance Manual.

Regardless of the guidance to use a standard 10-year window, there is no indication that the use of the most recent available data would impact the impairment listing. For example, using only data from 2014 and 2015, the time-weighted mean chlorophyll-*a* concentration is 47.3 µg/L and still exceeds the standard for this parameter. Flow influences the abundance of sestonic algae in the Minnesota River and these two years had different flow conditions. The graph below illustrates that under different flows 07020007-501 still grows undesirable levels of algae.



Mean daily discharge and summer mean chlorophyll-*a* for 07020007-501. Discharge is measured at Mankato, MN.

b) Point source discharges are not causing RES TP exceedances

This comment is a misinterpretation of the standard and the analyses used to support the standard. Since assessment of the standard is based on a mean concentration from two or more summers, meeting the standard for part of the summer does not demonstrate attainment of the standard nor does it necessarily implicate one source or another (although there are general patterns in the contribution of nonpoint versus point sources at different flows). In the case of the Minnesota River, lower flows, typically in late summer, are more conducive for the production of suspended algae. This is demonstrated by the fact that although TP concentrations approach the standard during lower flow conditions, this reach still greatly exceeds the standard for chlorophyll-*a*. However, it is not a demonstration that the chlorophyll-*a* goal is not attainable. The final part of this comment related to TMDL allocations which is beyond the scope of these responses.

c) RES assumptions invalid for Minnesota River

The comment correctly points out that the potential for suspended algae growth varies under different conditions in the Minnesota River. The plot showing a negative relationship between TP and chlorophyll-*a* is more informative regarding the relationship between flow and chlorophyll-*a* (which the above graph of discharge and chlorophyll-*a* illustrates). The negative relationship is attributable to high flows (and increased sediment loads) which can carry high concentrations of TP, but the flow conditions (i.e., low residence time) are not conducive for algal growth. However, in this stretch of the river there is still sufficient TP available during low flow conditions to grow excessive amounts of algae and thereby trigger an exceedance of the RES standard. Therefore, the implication that reducing TP will not impact chlorophyll-*a* concentrations is incorrect. Flow, nutrients, light, and other factors can promote or limit the growth of suspended algae in rivers. Concentrations of chlorophyll-*a* are particularly high during lower flow summers, although this stretch of the Minnesota River also often grows undesirable levels of suspended algae during summers with higher flows. The low chlorophyll-*a* concentrations during a portion of a summer are the result of residence time and shading that limits growth, and not due to some fundamental difference in the response of this river to nutrient additions. When conditions become suitable for algal growth (i.e., increased residence time, increased light), the excessive levels of nutrients in the river result in high levels of chlorophyll-*a*. This is fully consistent with the RES standard. In fact, data from this section of the Minnesota River was used in the development of the standard.

The comment that reductions in TP at higher flows will not lower productivity is accurate to an extent. Although not all of the sediment and associated nutrients entering the system during high flows will be exported, much of it will. That means it will be more important to get reductions in TP during lower flows when point sources are a greater fraction of the nutrient loading.

d) Nutrient loading cannot be assessed using RES

See response to preceding comments: a, b, and c.

e) Additional point source phosphorus control will not achieve RES

This comment is beyond the scope of the response. Evidence clearly demonstrates an impairment on this reach. The determination of sources and appropriate reductions are part of the TMDL.

e) BOD₅ data indicate compliance with RES criterion

Data from 07020007-501, 07020012-503, and 07020012-501 all exceed the BOD₅ response variable component of the RES, however, at the time of assessment there were an insufficient number of samples from 07020007-501 and 07020012-503 to perform an assessment. The years with lower BOD₅ and chlorophyll-*a* correspond to higher flow years where conditions were less suitable for the growth of algae. It is not appropriate to select only a handful of years where the standard is met or close to being met. The standard is intended as a long-term average and, by this measure, the BOD₅ response variable is exceeded in 07020012-501.

Comments 23 and 28: Silver Lake, 27-0136-00, should be assessed as a shallow lake and not a wetland.

During the 2016 assessment of Silver Lake (AUID 27-0136-00), information was gathered to determine if the lake met the definition of a shallow lake or if it was a wetland. Input from Riley Purgatory Bluff Creek Watershed District, MPCA staff, and local stakeholders was reviewed.

The MPCA has determined that Silver Lake should remain in the shallow lake category. This basin does have characteristics of both shallow lakes and wetlands, however, the local use of Silver Lake is more indicative of a shallow lake. It will be added to the 2016 Impaired Waters List.

Comments 24 and 40: The MPCA should consider listing streams with both high phosphorus levels and evidence of high BOD₅ (5-day biochemical oxygen demand) or diel DO flux (24-hour dissolved oxygen fluctuation).

The MPCA's 2016 Guidance Manual has been updated to better clarify the use of BOD₅ and diel DO flux. Find it here: <https://www.pca.state.mn.us/water/minnesotas-impaired-waters-list>. See also response to Comment 40, "The EPA-approved river eutrophication standards for the Southern Nutrient Region must be used for assessment purposes".

Comment 25: The use of BOD₅ and DO flux as primary response variables for purposes of indicating nutrients impairments is not scientifically sound.

In EPA's approval letter, dated 1/23/2015, EPA approved Minnesota's Water Quality Standards for River Eutrophication, which include the causative variable TP and the response variables of chlorophyll-*a*, biochemical oxygen demand, diel DO flux, and pH. The accompanying decision document notes that "MPCA followed a process consistent with the four-step process set forth in EPA's Stressor-response Guidance to derive our eutrophication criteria," and that the response variables included were consistent with those provided in the EPA's stressor-response guidance (page 17 of EPA's Basis for Approval, <https://www.pca.state.mn.us/sites/default/files/wq-rule4-06mm.pdf>).

Comment 25: Commenter appreciates the MPCA’s acknowledgment that BOD₅ and DO flux are inappropriate nutrient impairment indicators unless tied to sestonic algal growth.

While the technical support document speaks to the intended linkage of biochemical oxygen demand and diel DO flux to sestonic algae, the promulgated rule does not. MPCA has revised its 2016 Guidance Manual to better reflect the promulgated and approved standards. The standards, as promulgated in rule and approved by EPA, state that biochemical oxygen demand and diel DO flux are independent response variables. In the Guidance Manual, MPCA has noted that while biochemical oxygen demand and diel DO flux are response indicators of eutrophication, there are factors other than eutrophication that cause elevated biochemical oxygen demand and diel DO flux, which means that extra care must be taken to ensure that if elevated BOD or diel DO flux are measured those results are a reflection of eutrophication and not caused by another factor. The Guidance Manual includes steps to evaluate the representativeness of the data to address this concern.

Comment 25: Impairment listings must be based on current data.

The MPCA uses any and all available data that meets data quality thresholds established by EPA and MPCA for the purposes of water quality assessments. The 2015 statewide assessment for river eutrophication utilized data in MPCA’s EQulS and from external sources such as EPA STORET, USGS, and Metropolitan Council. The most recent 10 years of data were used – October 1, 2004 to September 30, 2014. This is consistent with EPA guidance and the 2016 Guidance Manual (<https://www.pca.state.mn.us/sites/default/files/wq-iw1-04i.pdf>, page 16). A general call for data was made in September 2014 requesting that parties with water quality data they wanted used for assessment submit their data to the MPCA by November 3, 2014 so it would be included in assessments.

As the MPCA completes assessments on a rotating watershed basis, a number of the waters commented on have been assessed again since 2015. The following reaches of the Minnesota River were assessed in Spring 2016, for consideration for the 2018 Draft Impaired Waters List:

- Timms Cr to Redwood R (AUID 07020004-509)
- Shanaska Cr to Rogers Cr (AUID 07020007-501)
- Swan Lk outlet to Minneopa Cr (AUID 07020007-505)
- Bevens Cr to Sand Cr (AUID 07020012-501)
- Rush R to High Island Cr (AUID 07020012-503)
- RM 22 to Mississippi R (AUID 07020012-505)
- Carver Cr to RM 22 (AUID 07020012-506)

When the MPCA reviewed the results of the 2016 assessments for these reaches, 2015 data had become available. With the addition of another year of data, the 2016 review confirms the 2015 draft impairment decisions for aquatic life based on river eutrophication. Continuing on the rotating watershed cycle, MPCA will start monitoring in the Redwood River Watershed in 2017 with a new assessment to be completed in Spring of 2019.

Should interested parties have data to submit, an annual call for data is made via a GovDelivery email distribution list and through MPCA’s Waterfront Bulletin. The call for data is made in September prior to the start of assessments in January. Working with MPCA staff, a request can be submitted each year for waterbodies to be assessed outside of our rotating watershed approach. Also, an annual call for recategorization requests (corrections or delistings) is made each year, allowing for new data to be submitted and a review to be made on existing impairments. This is done through communication with Watershed Project Managers and the call is made in October.

MPCA is committed to making data-driven decisions. Methods used for assessing surface waters for RES do not preclude the MPCA from considering recent reductions in pollutant loading, especially if load reductions are longstanding and significant enough to result in a measurable change in ambient water quality. This, however, is quite rare. Specific circumstances, as described, have not been brought to MPCA's attention during this assessment process.

Comment 25: Evidence demonstrates that in some river systems further phosphorus reductions from point sources will not have a statistically significant impact on chlorophyll-*a* levels.

See Comment 21, part c.

Comment 26: Consider an opt-in assessment for the 2018 cycle for Church Lake, 10-0046-00.

The MPCA responded directly to the requestors in September 2016. The data is sufficient for assessment and a 2017 opt-in, or out-of-cycle, assessment will occur for AUID 10-0046-00, for consideration for the 2018 Impaired Waters List.

Comment 27: Data used for the eutrophication assessment of the Cannon River, 07040002-540, do not reflect current conditions.

The decrease in phosphorus loading by the city of Faribault is positive and commendable. However, without data demonstrating attainment under current conditions the reach cannot be removed from the Impaired Waters List. Data from 2009 and 2010 demonstrated that TP was more than three times the causative variable in the standard and that chlorophyll-*a* concentrations were also above the response variable in the standard.

The MPCA uses any and all available data that meets data quality thresholds established by EPA for the purposes of water quality assessments. The 2015 statewide assessment utilized data in MPCA's EQulS and from external sources such as EPA STORET, USGS, and Metropolitan Council. The most recent 10 years of data was used – October 1, 2004 to September 30, 2014. This is consistent with the 2016 Guidance Manual (<https://www.pca.state.mn.us/sites/default/files/wq-iw1-04i.pdf>, page 16). A call for data was made in September 2014 requesting that parties with water quality data they wanted used for assessment submit their data to the MPCA by November 3, 2014 so it would be included in assessments.

A call for data is made annually; if new data are collected, an assessment can be requested outside of the MPCA watershed cycle. If new data demonstrate attainment of the aquatic life use, then the reach would be removed from the Impaired Waters List at that time.

Comment 30: The commenter, 3M Company (3M), requests that the MPCA remove the impairment designation for perfluorooctane sulfonate (PFOS) in fish tissue and water column from AUID 07010206-502, the fourth downstream assessment unit of Mississippi River Pool 2. Doing so will more accurately portray the health of AUID 502.

Response: The MPCA does not agree with this recommendation, for reasons given in the responses below to points in the commenter's letter.

Background and basis for 2014 listing decision for AUID 07010206-502 (AUID 502)

The MPCA divides all lakes and rivers into assessment units based on geographic features, and each unit is given an identification number (AUID). Pool 2 has four AUIDs, and the most downstream AUID (AUID 502) contains the lower five-mile section. AUID 502 is near the 3M Cottage Grove facility. In the 2014 draft 303d list submitted to the EPA, the MPCA recommended delisting the PFOS fish-tissue impairment

designations of the three upstream sections of Pool 2. The lowest section (AUID 502) remains on the impaired waters list for PFOS in fish tissue and the water column.

Overall, PFOS concentrations in fish tissue in Pool 2 of the Mississippi River have generally declined since 2009 (based on data collected in 2011 and 2012). However, one part of Pool 2 (AUID 502) continued to exhibit higher fish contaminant levels. An extensive MPCA fish and water study, designed and conducted in cooperation with 3M, the Minnesota Department of Natural Resources, and the Minnesota Department of Health in 2009, found that from Spring Lake to the Hastings Dam (river mile 820 to 815.2) within AUID 502, four of the five tested fish species had average fish-tissue PFOS concentrations that exceeded 200 nanograms per gram (ng/g), which is the numeric interpretation of the narrative standard used to determine support/non-support of the aquatic-consumption beneficial use in waters.

The 2009 study was repeated in 2012, and found that in this same stretch of river, which is part of AUID 502, the fourth (most downstream) of four assessment units comprising Pool 2, the average PFOS concentration was 347 ng/g in freshwater drum and 438 ng/g in carp. Therefore, fish in this portion of the AUID continue to exceed the use-support threshold for PFOS in fish tissue, and thus this AUID does not support the established aquatic-consumption beneficial use of this water.

PFOS concentrations in water collected in 2009, 2011, and 2012 from AUID 502, near the 3M Cottage Grove facility, were above the site-specific water quality criterion for Pool 2 (criterion was seven nanograms per liter (ng/L) based on 2009 results and recalculated to 14 ng/L based on 2012 results). Therefore, this AUID exceeds the use-support threshold for PFOS in water. It was recommended that AUID 502 be listed for PFOS in the Water Column in addition to the existing listing for PFOS in Fish Tissue. Additional information is available in the 2012 update report, which can be found at: <http://www.pca.state.mn.us/bkzq82b>.

3M argued against this designation of AUID 502 in its comments in 2014, and 3M makes similar arguments in its comments on the 2016 Draft Impaired Waters List, citing data from its own 2013 fish study. The 3M 2013 fish study was available to the MPCA when the MPCA made its decision on listing on the 2014 impaired waters list. As the MPCA noted in its 2014 response to 3M's comments, there appeared to be important design differences between the 3M 2013 study and the MPCA's 2009 and 2012 studies that add uncertainty to the results.

3M Comments: MPCA's Guidance supports use of the most recent data for assessment and delisting and provides that new data may be used to support delisting if "tangible improvements" have occurred. MPCA's fish and water data collected through 2012 are no longer relevant, and the most recent 3M 2013 data should be used. The 2013 data support the delisting of AUID 502 because no average PFOS concentrations in species in this section exceed the 200 ng/g trigger level for impairment.

MPCA Response: The 2013 data cited by the commenter was available to the MPCA during the 2014 assessment and listing process. To determine whether there is a valid trend requires a minimum of three sampling events. Using only the most recent data from a single year could not show a valid trend as a basis for delisting. The tangible improvements cited by 3M are 3M's reports of reduced PFOS discharge loading to the Mississippi from the 3M Cottage Grove facility. While these improvements are good news, the measured response to date of PFOS in fish tissue in AUID 502, including the 2013 3M study, does not yet establish a valid downward trend for two species of fish (carp and drum) in this section.

The bioaccumulative nature of PFOS is such that it will take an unknown period of time for the fish that have been exposed to PFOS in water and the food chain to exhibit the lower tissue concentrations hoped for as a result of reduction in PFOS releases to their waters.

Further, it is not certain that the releases of PFOS to the Mississippi via groundwater seepage have been fully contained by remediation efforts so far. As of November 2016, MPCA Remediation program staff report that the groundwater pumpout system at the Cottage Grove plant, intended to capture and treat perfluorochemical (PFC)-laden groundwater at the site, is not yet working as hoped, and that PFCs continue to seep into the river near the area of concern in Pool 2, where fish and their food supply may be exposed.

The MPCA has collected additional fish for analysis from AUID 502 in 2016, and it is hoped that the 2016 data will further illuminate the state of the fishery with respect to PFOS. It remains the MPCA's goal to see the fishery fully restored and fish tissue impairments delisted.

However, it is important to note that the state of knowledge about the toxicology of certain PFCs, including PFOS, is evolving. In May 2016, the EPA announced the results of a multi-year review of its health-based guidance for drinking water exposure to PFOS and perfluorooctanoic acid (PFOA), and lowered its health benchmark from 300 nanograms per liter (ng/l) to 70 ng/L. In addition, the Minnesota Department of Health is looking at whether to modify its Health Risk Limit for PFOS and PFOA as a result of the EPA guidance. Because drinking water is an oral ingestion pathway, as is fish consumption, this recalculation of drinking water guidance may in the near future translate to tighter benchmarks for fish consumption as an exposure pathway at the state level.

3M Comment: 3M's 2013 water data supports the delisting of AUID 502 because measured concentrations were below the site specific water quality criterion of 14 ng/L.

MPCA Response: The commenter states that "3M did not collect samples at the mouth of East Cove and immediately downstream, as these samples are only representative of their immediate vicinity, not the entirety of AUID 502." As the MPCA has previously stated, however, an assessment of impairment in an AUID indicates the existence of a water quality problem within the AUID that needs to be addressed. In this case, the impaired portion of AUID 07010206-502 near the 3M Cottage Grove facility, as evidenced by the MPCA's most recent available data from that relevant area, is sufficient reason to list the AUID as impaired.

The commenter additionally quotes MPCA language regarding guidance for the location of monitoring efforts. Read in its overall context as an excerpt from an appendix to the MPCA's citizen monitoring guide, however, it is obvious that the language applies to citizen-collected data that citizen collectors want the MPCA to use for assessment purposes. The point of the quoted language is to prevent the monitoring from being done within mixing zones. The MPCA's water quality monitoring that is the basis of the listing of AUID 502 as impaired for PFOS in the water column was, in the MPCA's judgment, conducted in well-mixed areas, including a site two miles downstream of the East Cove.

Conclusion: In the MPCA's best professional judgment, substantial concern and uncertainty remain with respect to this lowest section of Pool 2 (AUID 07010206-502). In light of PFC releases at the Cottage Grove site not fully remediated, new fish-tissue data expected in 2017, and the likelihood that impairment benchmark concentrations may be significantly lowered, it would not be prudent to delist the fish tissue impairment for AUID 502 at this time. It is the MPCA's goal to work for full restoration of all beneficial uses of Pool 2 waters.

Comment 31: Based on a review of the available data, the South Fork of the Zumbro River, 07040004-507, should not be listed as impaired for either nutrient/eutrophication biological indicators or aquatic macroinvertebrate bioassessments.

River eutrophication parameters indicate 07040001-507 is impaired for the RES standard. Average TP is well over the causal variable of 100 µg/L based on nine years of monitoring. Average chlorophyll-*a* is above the response variable of 18 µg/L based on four years of monitoring. Two deployments of sondes (June-July 2012, August 2014) also had average DO flux concentrations exceeding the response variable of 3.5 mg/L.

The MPCA is currently reviewing these data to determine if a site-specific standard is appropriate for this reach. At this time, the outcome of the review is not known. It could result in a new site-specific river eutrophication standard for this reach of the South Fork of the Zumbro. The new standard may or may not result in an impairment for this reach. If it does not result in an impairment, a correction can be issued to remove this reach from the Impaired Waters List at that time.

Consistent with the 2016 Guidance Manual (page 26), biological scores within the confidence interval are considered potentially impaired and supporting information is utilized to help complete the assessment. All of the sampling visits were within the confidence intervals. Station 12LM066 had low diversity and the visit was dominated by tolerant taxa. This is indicative of an impaired stream for invertebrates. Other stresses, such as sand deposits and elevated nitrates were also noted. Given the availability of supporting information to indicate an impairment, the MPCA has maintained this listing on the draft 2016 Impaired Waters List.

Comment 33: While both total phosphorus and chlorophyll-*a* exceed the river eutrophication criteria in the Shell Rock River (07080202-501), several lines of evidence indicate that point source loads of phosphorus are not the causing or contributing to chlorophyll-*a* exceedances.

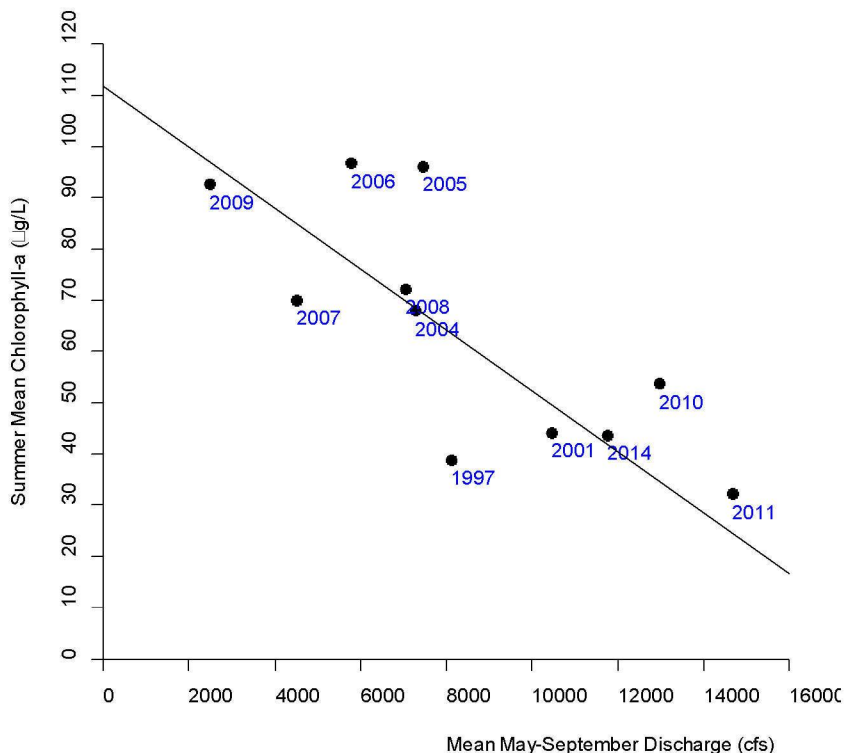
The source of the impairment has no bearing on the impairment decision unless the source is natural. This comment gets into the implementation of TMDLs which is beyond the scope of this response.

Comment 35: Using data from 2010, 2011, and 2014, concentrations of chlorophyll-*a* in the Minnesota River, 07020007-501, indicate near attainment within confidence intervals. Analysis of the high total phosphorus concentrations suggest that the relationship between the causative variable (total phosphorus) and response variable (chlorophyll-*a*) is contradictory. As a result, there is insufficient data to list 07020007-501 for nutrients.

The use of a 10-year window is the standard time period used by the MPCA in assessments and it is the time period used for RES assessment. A minimum of two years may be used, but when multiple years of data are available from the previous 10 years they are used in the assessment. The 10-year time period is important to capture conditions over different flow and weather conditions, particularly for RES. This is documented in the 2016 Guidance Manual.

Selecting a subsample of years from the assessment 10-year window is not appropriate for assessment. Selecting only the years 2010, 2011, and 2014 is not consistent with assessment guidance because it does not capture different flow and weather conditions. Specifically, these three years correspond to the years with the greatest May-September mean discharge (see figure). Chlorophyll-*a* concentrations are lower at higher flows because there is lower residence time and increased shading due to higher turbidity that limits algal growth. These conditions limit algal growth despite the presence of sufficient levels of phosphorus to grow undesirable levels of algae. Selecting years where conditions were not favorable for algal growth does not demonstrate attainment of the RES as the standard is intended to be applied across different flow and weather conditions. The appropriate use of available data from 2005

through 2014 demonstrates that the chlorophyll-*a* are almost two times the standard and that there is a high degree of certainty that this reach is impaired. Furthermore, there is nothing to suggest that the lower concentrations of chlorophyll-*a* during these years is the result of improving conditions. Specifically, these three years are consistent with the relationship between flow and chlorophyll-*a*. If conditions had improved to the point where phosphorus reductions were lowering the amount of algae growing the river, we would expect to see these three years falling below the regression line.



Mean May-September discharge (cfs) versus time-weighted summer mean chlorophyll-*a* (µg/L) from 07020007-501. The regression is based on 1997 – 2009 data ($R^2 = 0.41$).

The commenter also states that the relationship between the causative variable (total phosphorus) and response variable (chlorophyll-*a*) is contradictory. This incorrect conclusion hinges on the previous comment (i.e., chlorophyll-*a* is meeting or near meeting the RES standard when only the three most recent years of data are used). However, since the data analysis is not an appropriate approach to evaluating compliance with the RES and there is a clear exceedance of the RES when the 10-year window of data is appropriately included, the nutrient and algal response in the Minnesota River (07020007-501) is fully consistent with the RES. In fact, data from this reach was used in the development of the RES.

Comment 36: South Two River, 07010201-532, should not be listed as impaired.

a) This listing is erroneous because it is based on outlier chlorophyll-*a* data.

MPCA agreed that the average contained a high data point. Attempts were made to contact local data providers to determine the circumstances around the elevated concentrations observed; MPCA received that information on January 3, 2017. Field/lab notes were destroyed and no longer available, per document management rules with the contractor. MPCA is in the watershed in 2017 and will collect additional data to characterize the stream and the reach will be re-assessed in Spring 2018. MPCA will remove the reach from the 2016 Impaired Waters List due to the uncertainty around the chlorophyll-*a* data.

b) Reduced mass limit for total phosphorus will have no measureable impact.

Minnesota Rules 7053 regulate effluent limits and treatment requirements for point source discharges of wastewater. Specifically, Minnesota Rule 7053.0205 Subp. 7.C. provides the MPCA with the authority to consider nonpoint source reductions when setting effluent limits. This rule, however, does not require that the MPCA to consider future pollutant load reductions prior to making an assessment determination. Point source discharges are not the only source of nutrients in the watershed. The TMDL will determine appropriate load allocations for facilities and nonpoint sources contributing to the impairment

Comment 38: Commenter asks that that following nutrient impairments be removed from the 2016 Impaired Waters List because the stream reaches were assessed using a scientifically incorrect River Nutrient Region.

The MPCA disagrees that scientifically incorrect River Nutrient Region was assigned to this reaches below. Ecoregion analysis developed by the EPA provides the scientific basis for the Minnesota River Nutrient Regions. Ecoregions are a cohesive scientific concept for regionalization of land and water systems which is reasonably used for multiple applications, including the regional application of water quality standards. As guided by EPA, MPCA's choice of using ecoregions is reasonable and the regions are mapped correctly at the ecoregional scale. See also the MPCA's response to comments on the adoption of river eutrophication standards: <https://www.pca.state.mn.us/sites/default/files/wq-rule4-06s.pdf>, page 4.

a) Porter Creek, 07020012-540

This reach is held to the Central River Nutrient Region Standards for TP. TP exceeds the criterion of 100 µg/L based on six years of monitoring. The BOD₅ detection limit was changed to 0.0 mg/L and the adjusted average, with only two years of monitoring data, was 2.4 mg/L which still exceeds the criterion of 2.0 mg/L. Chlorophyll-*a* is above the criterion of 18.0 µg/L based on four years of monitoring.

b) Sand Creek, 07020012-513

This reach is held to the Central River Nutrient Region Standards for TP. The summer average TP is well above the RES of 100 µg/L based on extensive monitoring where 10 of 10 summers were sampled. Chlorophyll-*a* exceeds the RES of 18 µg/L based on 10 years of monitoring.

c) Sand Creek, 07020012-662

This reach is held to the Central River Nutrient Region Standards for TP. The summer average TP is well above the RES of 100 µg/L based on extensive monitoring where 6 of 10 summers were sampled. Chlorophyll-*a* is also well above the RES of 18 µg/L based on four years of monitoring. BOD₅ exceeds the RES of 2.0 mg/L based on two years of monitoring.

Comment 38: Commenter asks that that following lakes be removed from the 2016 Impaired Waters List for nutrients.

a) Dean Lake, 70-0074-00, does not meet the depth requirements to be considered a lake.

MPCA agrees the basin is a wetland. MPCA is correcting the 2006 listing on the 2018 Impaired Waters List because it was assessed in 2016 as part of the 2018 listing cycle.

b) McMahon Lake, 70-0050-00, is meeting standards and can be delisted.

MPCA is delisting the 2002 listing on the 2018 Impaired Waters List. MPCA is in the process of getting data from local partners into the system to complete the work. The data was not submitted in a timely fashion to facilitate the removal for the 2016 Impaired Waters List.

Comment 38: Data used to list Unnamed Creek 07020012-579 (Picha Creek) is not representative of a perennial creek. Please remove from the Impaired Waters List.

In 2014 – 2015 the Lower Minnesota River Watershed was monitored as part of the MPCA’s Intensive Watershed Monitoring (IWM) effort. As a result, an additional biological monitoring station was established on Picha Creek (07020012-579), located downstream of an area where there is sustained groundwater discharge to the creek as identified in the 2009 Sand Creek Impaired Water Resources Investigation. Biological (fish and invertebrate) data were collected in 2014 at the original station on top of the bluff (01MN058) as well as at this new location below the bluff (14MN200). These data were analyzed in the spring of 2016 as part of the surface water assessment process, the results of which will be reflected on the 2018 Impaired Waters List. The invertebrate and fish IBI scores at both monitoring stations indicate that this stream is not supporting its designated aquatic life use and thus 07020012-579 should remain on the 2016 Impaired Waters List. As requested, the MPCA changed the name of AUID 07020012-579 from “Unnamed creek” to “Unnamed creek (Picha Creek)”.

Comment 40: MPCA must include waters that exceed the river eutrophication standards on the State’s Impaired Waters List regardless of whether the exceedance is linked to documented sestonic algae growth.

MPCA agrees that the river eutrophication standard is based upon the occurrence and impacts of nutrient enrichment (i.e., eutrophication). While excessive sestonic algae growth is one indicator of eutrophication, it is not the only indicator. MPCA revised its 2016 Guidance Manual after the public comment period to better clarify the application of the response variables. This includes removal of the language linking all response variables to sestonic algae.

MPCA reviewed each reach identified in Minnesota Citizens for Environmental Advocacy’s (MCEA’s) Appendix A, a list of AUIDs that exceed state standards for phosphorus and one or more response variable and meet MPCA’s current data minimum requirements. Comments for each AUID are included in the accompanying Appendix A of this document. As a result of this review, MPCA is adding the following waters to the 2016 Draft Impaired Waters List:

- Unnamed creek, Woodland WMA wetland (86-0085-00) to N Fk Crow R (AUID 07010204-667)
- Crow River, South Fork, Headwaters to 145th St (AUID 07010205-658)
- Le Sueur River, Maple R to Blue Earth R (AUID 07020011-501)
- Heron Lake Outlet, Heron Lk (32-0057-01) to Des Moines R (AUID 07100001-527)

In its Appendix B, MCEA identifies waters with river eutrophication parameters that fall below the current data minimums (8 to 11 samples) and references the application of the lake eutrophication standards. Lake water quality is considerably less variable from year to year than rivers/streams. MPCA included the 12 data point minimum to ensure that a representative dataset was collected to determine impairment. MPCA will not list those waters included in MCEA’s Appendix B for river eutrophication, as they do not meet the data minimums set in guidance.

Comment 40: The EPA-approved river eutrophication standards for the Southern Nutrient Region must be used for assessment purposes.

The MPCA conducted a statewide assessment for river eutrophication in 2015, and the 2016 Impaired Waters List does include rivers and streams that exceed Minnesota's river eutrophication standards. The commenter also states that the MPCA guidance "rewrites" the EPA approved river eutrophication standards with less stringent numeric thresholds for the Southern Nutrient Region, a long-term averaging period, and an improper assumption about sestonic chlorophyll-*a*. The MPCA guidance does not rewrite the numeric thresholds for the Southern Nutrient Region. Due to a drafting error, the promulgated thresholds for the Southern Region Class 2B waters are different than those for the Class 2A and 2Bd Southern Region waters – despite MPCA's intent that they be the same. The MPCA plans to revise the rule to address this.

The MPCA also believes that the record is clear concerning the MPCA's intent to use a long-term, multi-year averaging time for the standard. This is referenced directly in the Minnesota Nutrient Criteria Development for Rivers (page 99 of the revised draft January 2013, <https://www.pca.state.mn.us/sites/default/files/wq-s6-08.pdf>), Book 2 of the SONAR (page 81, <https://www.pca.state.mn.us/sites/default/files/wq-rule4-06f.pdf>). The MPCA updated the 2016 Guidance Manual to better outline how the assessment methodology is applied, clearly stating the application of BOD₅ and diel DO flux as response variables, independent of sestonic algal measurements.

Comment 40: MPCA must list, as impaired, rivers and streams that exceed river eutrophication standards as a summer average.

MCEA points to two definitions in statute: <https://www.revisor.mn.gov/rules/?id=7050.0150>. "Summer-average" means a representative average of concentrations or measurements of nutrient enrichment factors, taken over one summer season. "Summer season" means a period annually from June 1 through September 30.

The record is clear concerning the MPCA's intent to use a long-term, multi-year averaging time for the standard. This is referenced directly in the Minnesota Nutrient Criteria Development for Rivers (Revised draft January 2013, page 99), and Book 2 of the SONAR (page 81). This is also described in the 2016 Guidance Manual and is applied in the same fashion as the lake eutrophication standards. This multi-year approach is critical to account for variability in water levels and flows, which will drastically change water quality, especially in streams.

Comment 40: MPCA's minimum data requirements and monitoring strategy prevent the MPCA from identifying waters that exceed river eutrophication standards.

MPCA's data minimums are designed to support confidence in listing decisions and to avoid listing a waterbody that is not impaired. A minimum of two years of data and 12 samples is in line with the MPCA's Intensive Watershed Monitoring approach and referenced in MPCA's Water Monitoring Strategy submitted to EPA on September 28, 2011 (<https://www.pca.state.mn.us/water/water-quality-monitoring-strategy>).

MPCA monitors and assesses on a rotating watershed approach; intensively assessing each of the state's HUC 8 watersheds once every 10 years. The rotating approach allows for comprehensive assessment of each watershed, and provides complete information to inform Watershed Restoration and Protection Strategies/TMDLs. The rotating approach allows MPCA to focus resources (staff and funds) and collect comprehensive data on a watershed. The MPCA also funds local organizations for additional water

monitoring. Finally, the MPCA annually asks other partners to submit their data and assessments, and offers opportunity for waters to be assessed annually outside of this watershed rotation.

The commenter incorrectly portrays the intensive watershed monitoring approach. As described by the commenter, the approach does set up intensive chemistry to be sampled at aggregated HUC12 outlets and biological sampling at HUC14 outlets; however, the commenter does not adequately describe the chemistry collected. For routine chemistry, MPCA collects 10 grab samples with an additional nine sonde measurements of DO, pH, temperature, and conductivity. In waters identified for river eutrophication sampling, the grab samples are increased to reach the minimum of 12 samples over a two-year period for TP and chlorophyll-*a*. Due to hold time restrictions and lab detection limits, it is not always feasible to sample BOD₅. Also, MPCA has limited sondes available for deployment. It is not possible to collect DO flux data in all locations. It is not required that MPCA collect all the response variables in order to determine if a reach is impaired. MPCA also collects periphyton data at some locations; however, the periphyton collection method is limited in substrate type and is not applicable in all waters. The MPCA uses BOD₅, pH, and diel DO flux data to indicate eutrophication from excess sestonic and benthic algae and rooted vegetation. This reduces the need to collect periphyton data.

MPCA used the results of the statewide river eutrophication assessment to set monitoring priorities in the 2017 watersheds; MCEA received this information. Stream reaches where a full river eutrophication assessment could not be completed were reviewed by MPCA and prioritized for follow up monitoring. Reaches where a limited dataset was available, but phosphorus concentrations were below the causal variable (i.e., likely meeting the RES), would be low priority. However, reaches where the data was inconclusive, where there were issues with data representativeness, or elevated levels were observed but not in sufficient quantities, were assigned more monitoring for river eutrophication so a complete assessment could be made. MPCA does not have sufficient funding to monitor every mile of water in the state, so prioritization is necessary. The monitoring approach and site prioritization allow for the MPCA to ensure that monitoring locations are identified at a fine enough scale to help facilitate protection and restoration activities, including identifying where reductions are required and permits can be evaluated accordingly. MPCA does not include its monitoring strategy or monitoring plans in its 2016 Guidance Manual.

Comment 40: MPCA has not collected enough data to determine whether any rivers and streams exceed the statewide periphyton standard.

The commenter correctly states that MPCA has not collected sufficient information to determine if the periphyton standard has been exceeded. With that said, periphyton data were collected over four different years: seven locations in 2009, four sites in 2012, two sites in 2013, and one site in 2016 (four were planned but consistent high flows prevented safe sampling). The MPCA worked in 2016 to modify the sample collection method to improve sampling consistency. The sites selected for 2016 were in direct response to information provided during the statewide assessment. The MPCA is working to further implement periphyton sampling in routine monitoring.

Comment 41: Commenter is concerned that the MPCA continues to add waters to the Impaired Waters List based on bio-assessments without the benefit of the adopted TALU rules.

As noted by the commenter, the MPCA has been relying on a narrative aquatic life standard for listing impaired waters based on biological community data. Since 2002 the MPCA has been using index of biotic integrity (IBI) scores for fish and macroinvertebrates as a numeric translator of our narrative aquatic life standards using a reference site approach to derive thresholds that distinguish between supporting and non-supporting aquatic life IBI scores (Minn R. Ch. 7050.0150, subp. 6). The adoption of a tiered aquatic life use (TALU) framework of standards represents both a refinement of the current one-size-fits-all standard as well as a formal adoption of numeric biological criteria in rule (i.e., IBI scores) rather than the

aforementioned numeric translator approach to biological assessment. However, it is the intention of the MPCA to continue using the current biological assessment approach until TALU has been adopted in rule to insure that watershed restoration and protection strategy development stays on schedule.

Comment 41: Commenter raised concerns regarding data quality assurance/quality control and sufficiency, and MPCA databases.

The commenter also raised issues on data quality during the 2014 Impaired Waters List process. The MPCA worked with the commenter's staff and other local partners and resolved the data quality issues. The MPCA requires that groups that submit data to MPCA's EQuIS database complete a data review to ensure the data is correct and ready for use. Only after a completed data review does MPCA use the data for assessments. However, as noted in 2014, if a local data provider makes a mistake, that mistake will carry through to the assessment process where it is often identified during the professional judgement group meetings. The MPCA also reviewed specific assessments at Minnesota Department of Transportation's (MnDOT's) request, to make sure that the listings were made with sufficient datasets. During that review a number of draft listings were removed until more rigorous data could be collected. Unless a specific example is offered, MPCA cannot explicitly address how it was resolved.

MPCA partners, including MnDOT, were notified during the 2014 Impaired Waters List review that a new data system was being built that would provide easier access to data and in a more reliable way. The MPCA provides data to partners upon request and has not received a specific request from MnDOT.

Comment 44: The commenter states that the 24 waters listed in Minn. R. 7050.0470 with the [WR] designation that have poor or missing wild rice communities must be listed as impaired for the narrative Class 2 aquatic life and recreation water quality standard.

The MPCA agrees with the commenter that waters specifically identified as [WR] are wild rice waters. However, the comment ignores the fact that these waters are specifically designated under Class 4 for agriculture and wildlife designated public uses and benefits. Therefore, it would be inappropriate to apply the Class 2 standard to these Class 4 [WR] designated waters.

Comment 44: All changes to the manual since the 2014 Guidance Manual should be explicitly listed.

A preface to highlight major revisions was included in the 2016 Guidance Manual that was updated after public comment. Find it here: <https://www.pca.state.mn.us/water/minnesotas-impaired-waters-list>.

Appendix A: As part of Comment 40, responses to AUIDs identified by MCEA as exceeding state standards for phosphorus and one or more response variable and meeting MPCA’s current data minimum requirements

AUID	MPCA response after review
07020003-501	Dissolved oxygen (DO) flux deployments were single days. This does not meet the minimum timespan defined in rule. Chlorophyll- <i>a</i> meets standard, and biochemical oxygen demand (BOD ₅) and DO flux do not meet data minimums.
07020003-506	DO flux deployments were single days. This does not meet the minimum timespan defined in rule. Response variables chlorophyll- <i>a</i> , BOD ₅ , and DO flux do not meet data minimums.
07020007-571	No chlorophyll- <i>a</i> , BOD ₅ , or DO flux were available. pH has 24 measurements within the June to September window. Three exceed the standard. Notes from the assessment indicate that there was low confidence in the data. The exceedances were from early in the dataset and not repeated in subsequent years. This is consistent with how MPCA approaches assessments. If there are concerns with quality, or elevated concentrations were limited to early in the dataset and not evident in subsequent sampling, an assessment insufficient information is assigned to the designated use.
07020007-679	No chlorophyll- <i>a</i> , BOD ₅ , or DO flux data are available. pH has 30 measurements within the June to September window; five exceed the standard. Notes from the assessment indicate that three of the exceedances were of very low magnitude. Not sufficient confidence in the data to recommend a listing.
07020011-501	Promulgated standard for Class 2B Southern Nutrient Region waters is 40 µg/L for chlorophyll- <i>a</i> . A Time-weighted average was completed to deal with the bias in the data; the time-weighted average is 40.4 µg/L. As a result, the reach is exceeding the chlorophyll- <i>a</i> standard. Follow up monitoring is scheduled in 2018 – 2019 for this reach. MPCA is adding the reach to the 2016 Impaired Waters List.
07030005-504	This reach overlaps Lake St Croix, which is already on the Impaired Waters List for lake eutrophication (a much more stringent standard). Both portions of this segment – the river and the lake – are slated for monitoring in 2017 and 2018. A listing for a river standard on a lake is not appropriate. MPCA intends to make adjustments to the linework during the St Croix River assessments in 2019.
07030005-520	pH data within the June to September date range is 12 samples, of those one exceeds the standard. This is less than the 10% impairment threshold used by MPCA. BOD ₅ is supporting and limited chlorophyll- <i>a</i> also is meeting the standard. It is not appropriate to list a reach when response variables do not indicate impairment.
07040001-504	MPCA clearly stated in the original comments that this reach was not listed because during modeling efforts, it was determined that 80% of the flow at this location was backwater from Lake Pepin. This lake already has a TMDL underway. MPCA has utilized this approach on this reach since the Turbidity TMDL indicated that the water was not from the Vermillion River, but from Mississippi River/Lake Pepin.
07010206-528	MPCA clearly stated in the original comments that this reach was not listed because greater than 50% of the BOD ₅ samples were non-detects. The detection limit of 2.0 mg/L is the same as the standard for this region. The true values of the BOD ₅ samples cannot be determined and it is not appropriate to list a water based on detection limit values.
07010206-538	Total phosphorus just exceeds the standard, chlorophyll- <i>a</i> and pH meet the standard and BOD ₅ data is just above the standard at 2.1 mg/L. Removing the non-detect data reduces the average to 1.9 mg/L. Monitoring is scheduled on this reach for 2020. The MPCA does not agree that a listing is warranted. With follow up monitoring planned, MPCA feels it is appropriate to wait for additional data to be collected prior to determining attainment.

AUID	MPCA response after review
07010206-732	MPCA clearly stated in the original comments that this reach was not listed because greater than 50% of the BOD ₅ and chlorophyll- <i>a</i> samples were non-detects. The BOD ₅ detection limit of 2.0 mg/L is the same as the standard for this region. The true values of the BOD ₅ and chlorophyll- <i>a</i> samples cannot be determined and it is not appropriate to list a water based on detection limit values.
07010207-525	The average DO flux was 3.0 mg/L. The summary string that MCEA references in Appendix A of their comment is the standard (3.5 mg/L), the number of daily flux values that exceed (not the average deployment flux), and the number of deployments. With the standard being 3.5 mg/L, this reach is in compliance with the diel DO flux standard.
07010204-585	Five deployments occurred at three stations during 2008 and 2009. All of the deployments exceeded the 3.5 mg/L flux standard. One station H18051003 was within the mixing zone of the outfall of the Litchfield WWTP and H18051001 was between two large wetland complexes; data confidence in these deployments is low. However, H18051004 is downstream of the mixing zone and upstream of the wetland complexes. That station had a 12-day deployment from September 2008 with an average flux for the deployment of 5.8 mg/L. Follow up monitoring is slated for 2017 and 2018 on this reach. A re-assessment will be made following scheduled monitoring in 2019.
07010204-667	Single DO flux deployment in 2009 and BOD ₅ data are available. Both exceed the standard. Follow up monitoring is slated for 2017 and 2018 on this reach. The reach should be impaired and MPCA will updated the 2016 Impaired Waters List.
07010205-658	BOD ₅ exceeds the standard of 3.5 mg/L. The reach should be impaired and MPCA will update the 2016 Impaired Waters List.
07010206-508	MPCA clearly stated in the original comments that this reach was not listed because greater than 50% of the BOD ₅ samples were non-detects. The BOD ₅ detection limit of 2.0 mg/L is the same as the standard for this region. The true values of the BOD ₅ samples cannot be determined and it is not appropriate to list a water based on detection limit values.
07010101-521	The sonde deployment was made during low flow/stagnant conditions in an area with active beaver activity (ponding and dams). The 10-day deployment had an average DO flux of 4.1 mg/L. There is low confidence in the deployment data due to notes on stagnant conditions and observed beaver activity. Staff sampling the reach indicated wetland conditions at the monitoring location. MPCA does not have sufficient confidence in the data on this reach to determine impairment.
07010105-534	MPCA clearly stated in the original comments that this reach was not listed because greater than 50% of the BOD ₅ samples were non-detects. The BOD ₅ detection limit of 2.0 mg/L is greater than the standard for this region, 1.5 mg/L. The true values of the BOD ₅ samples cannot be determined and it is not appropriate to list a water based on detection limit values.
07010203-579	Response data is only available for a single year. Assessment guidance indicates a minimum of two years of data. Follow up monitoring is scheduled for 2019 and 2020 on this reach.
07010204-542	BOD ₅ data exceeds the standard. However, the data confidence for BOD ₅ is low; lab notes indicate estimated values and other QA issues. Chlorophyll- <i>a</i> and DO flux deployments are meeting the standard. Follow up monitoring is slated for 2017 and 2018. With low confidence (QA/QC issues) in the data, MPCA does not feel it is appropriate to list.
07010204-546	MPCA does not use lake outlet data to characterize aquatic life use for streams. The lake is currently on the Impaired Waters List lake eutrophication. Lake data should not be used to assess a stream.
07010204-556	The chlorophyll- <i>a</i> average concentration is right at the standard of 18 µg/L. There is not sufficient confidence that the reach is showing impairment. Follow up monitoring is scheduled for station S001-274 in 2017 and 2018 to determine use attainment.

AUID	MPCA response after review
07040002-521	MPCA does not use lake outlet data to characterize aquatic life use for streams. The lake is current on the Impaired Waters List for lake eutrophication. Lake data should not be used to assess a stream.
07040002-542	This reach flows through multiple impaired lakes for lake eutrophication, a more restrictive standard. BOD ₅ data has 21 daily average values - of those 18 had non-detect values in the calculations. This reduces confidence that the values used in the average are reflective of actual conditions. Two DO deployments occurred - Two different stations along the reach in late August 2014. Both were 5-day deployments with average flux concentrations of 2.2 and 3.4 mg/L, meeting the standard of 3.5 mg/L. MPCA does not agree that an impairment should be assigned.
07040002-560	MPCA clearly stated in the original comments that this reach was not listed because a large percentage of the BOD ₅ samples were non-detects (10 of 21). The BOD ₅ detection limit of 2.0 mg/L is the same as the standard for this region. The true values of the BOD ₅ cannot be determined and it is not appropriate to list a water based on detection limit values.
07040002-582	The summary string that MCEA references indicates the average DO flux standard of 4.5 mg/L, a number of daily exceedances (not average flux concentrations) and the number of deployments. The 13-day deployment had a mean flux concentration of 3.6 mg/L, which meets the standard. MPCA does not agree that the reach is impaired.
07040003-512	This reach was reviewed based on comments from the 2016 303(d) Impaired Waters List public comment period. A drought was underway during the summer of the deployment for dissolved oxygen flux (July 2012). Guidance requires that deployments occur a minimum of two years over the assessment window to be sure that the data is representative. Follow up monitoring will occur in 2017 and the reach will be reassessed after additional data is collected.
07040004-581	The 12-day deployment was in August 2014. The average flux concentration was 3.5 mg/L; this equals the standard and indicates attainment.
07080201-503	Commenter inadvertently used the wrong summary statistic in their comments. Two simultaneous deployments occurred from August 29, 2012 to September 10, 2012. The average flux for the deployments were 3.4 and 3.6 mg/L. The standard is 4.5 mg/L. The response data do not indicate impairment.
07080201-515	A 13-day deployment occurred in July 2012 with an average flux concentration of 6.1 mg/L. The sonde was placed one mile downstream of the effluent outfall of Austin – this is within the area where mixing would impact DO concentrations. Periphyton sampling was scheduled for 2016, but high flows prevented it. Recommend that this reach not be added to the impaired waters list due to confidence issues with the sonde placement and influence of permitted discharge.
07080202-504	MPCA does not assess aquatic life use for streams on short connectors between lakes. This reach is a 0.3 mile channel connecting two impaired lakes, which have considerably more restrictive standards for eutrophication. MPCA does not agree that an impairment is warranted on this reach.
07100001-527	BOD ₅ exceeds the standard of 3.5 mg/L (Class 2B/C Southern Region promulgated standard). The reach should be added to the 2016 Impaired Waters List.
09020303-550	MPCA noted that samples were taken during no flow conditions. MPCA does not use no flow data for condition assessments. Removal of the no flow samples drops the BOD ₅ dataset below data minimums for assessment. MPCA does not agree a listing is warranted.

AUID	MPCA response after review
09020303-558	MPCA clearly stated in the original comments that this reach was not listed because greater than 50% of the BOD ₅ samples were non-detects. The BOD ₅ detection limit of 2.0 mg/L is greater than the standard for this region, 1.5 mg/L. The true values of the BOD ₅ samples cannot be determined and it is not appropriate to list a water based on detection limit values.
09020304-505	MPCA clearly stated in the original comments that this reach was not listed because greater than 50% of the BOD ₅ samples were non-detects. The BOD ₅ detection limit of 2.0 mg/L is greater than the standard for this region, 1.5 mg/L. The true values of the BOD ₅ samples cannot be determined and it is not appropriate to list a water based on detection limit values.
09020304-507	MPCA clearly stated in the original comments that this reach was not listed because greater than 50% of the BOD ₅ samples were non-detects. The BOD ₅ detection limit of 2.0 mg/L is greater than the standard for this region, 1.5 mg/L. The true values of the BOD ₅ samples cannot be determined and it is not appropriate to list a water based on detection limit values.
09020305-510	MPCA clearly stated in the original comments that this reach was not listed because greater than 50% of the BOD ₅ samples were non-detects. The BOD ₅ detection limit of 2.0 mg/L is the same as the standard for this region. The true values of the BOD ₅ samples cannot be determined and it is not appropriate to list a water based on detection limit values.
09020305-517	MPCA clearly stated in the original comments that this reach was not listed because greater than 50% of the BOD ₅ samples were non-detects. The BOD ₅ detection limit of 2.0 mg/L is the same as the standard for this region. The true values of the BOD ₅ samples cannot be determined and it is not appropriate to list a water based on detection limit values.
09020314-501	The summary string that MCEA references indicates the standard (3.0 mg/L), the number of daily flux values that exceeded (not the average deployment flux values) and the number of deployments. This reach had three deployments: an 83-day deployment with an average flux of 0.6 mg/L in Summer 2007, a 26-day deployment with a 1.3 mg/L average flux in July 2008, and a 9-day deployment in September 2008 with an average flux of 0.7 mg/L. The standard is 3.0 mg/L. The diel DO flux does not exceed the standard and a listing is not warranted.

Appendix B: Responses to AUID-specific comments, as part of Comments 18 and 41

AUID(s)	Comment	Response
09020303-501, 09020303-502, 09020303-503, 09020303-504, 09020303-506	In addition to the existing turbidity impairment, the Red Lake River also fails to meet the total suspended solids standard along this reach.	MPCA is not adding new impairments to the Impaired Waters List when an existing turbidity impairment is already on the list for that reach. When the turbidity impairment is addressed, the existing TSS standard will be used to identify the load reductions necessary. This is similar to how the agency handled the transition from fecal coliform bacteria to <i>E. coli</i> bacteria. The existing impairment remained on the list and the most current standard is used for TMDL development.
09020303-504	The ditch at the beginning of this reach is Pennington County Ditch 96, not "County Ditch 76."	AUID description changed from 'County Ditch 76' to 'County Ditch 96'.
09020303-505	There is a low dissolved oxygen problem in this ditch.	MPCA does not use data from no flow conditions to assess aquatic life use for water chemistry parameters. The raw and summarized continuous data were provided during the assessment from the local data provider. There was conversation at the PJG meeting that the data was from a sonde that utilized clark-cell technology and there was question about dates of flow/no flow and QA/QC information. Two days of discrete sampling had samples below 5 mg/L was not sufficient to list. Both biological assemblages were indicating support for aquatic life; one of which was collected during low oxygen conditions. Because biology indicated support and oxygen levels for the continuous data indicated potential problems, it was recommended that follow up monitoring occur.
09020303-505	The name of this ditch is Pennington County Ditch 96, not "County Ditch 76."	MPCA has changed AUID name to 'Pennington County Ditch 96 (76)'.
09020303-510, 09020303-511	Splitting these AUIDs was unproductive.	Most river reaches assessed by MPCA are split where a tributary joins the reach; this is how Minnesota manages its linework for assessments. This reach has not been recently split. While this reach may be inconvenient to sample routinely, biological sampling did occur indicating very high quality biota on the downstream reach (511) and very good biota from multiple visits on the upstream reach (510). Lack of chemistry data does not prevent protection efforts from occurring.
09020303-512	There is insufficient evidence to support the delisting of the turbidity impairment on this reach.	We agree. The turbidity impairment assigned to 09020303-512 will remain on the draft 2016 Impaired Waters List.
09020303-515, 09020303-516	The reach assignment for site S007-638 on Burnham Creek does not match the description due to a flawed GIS layer that shows Polk County Ditch 15 entering Burnham Creek upstream of CSAH 45.	MPCA's linework has been corrected. The station has been reassigned to AUID 09020303-551.

AUID(s)	Comment	Response
09020303-515, 09020303-528, 09020303-545, 09020303-551	The exclusion of water chemistry data collected during periods of zero flow (when flow records are available) is part of the assessment process. Could these conditions also be taken into consideration for potential biological impairments?	MPCA samples biology (fish and/or macroinvertebrates) at streams that have a defined channel, adequate depth to allow for the collection of a sample using appropriate gear, and protocols throughout the relevant index period. Any stream that with adequate depth throughout its channel at the time of sampling is considered a sampleable stream. The stations in question met these criteria and were determined to not have additional mitigating factors that would preclude them from assessments.
09020303-542, 09020303-547, 09020303-550	Expectations for aquatic life in this channel should be low. Could the reach be reclassified to change expectations?	A use attainability analysis would need to be completed to determine that this reach is not expected to support aquatic life. The link for how to petition the agency to consider attainability of use is here: https://www.revisor.mn.gov/rules/?id=7050&view=chapter#rule.7050.0405 . Until that time, it is assigned the modified aquatic life and recreation uses, and standards. MPCA staff will discuss reclassification with the Red Lake Watershed District. Any changes to impairments will occur on later Impaired Waters Lists.
09020303-545	The name of this channel, according to Pennington County Highway maps, is Branch 5 of Pennington County Ditch 96 (Br 5 CD 96).	Changed AUID name to "Branch 5 of Pennington County Ditch 96" and AUID description to "Br 2 CD 96 to CD 96 main stem".
09020303-547	Despite the fact that it was constructed for drainage purposes and not for fish habitat, the reach actually met the criteria for fish IBIs. Yet it is still being listed as impaired by "fishes bioassessments."	Four tolerant fish species were caught resulting in a score that was slightly above the modified use threshold but within the confidence interval. Extremely low number of fish and species suggest severe impairment and a fish-IBI score may not be adequately reflecting biological condition. For this reason, an impairment based on fish was assigned. Consistent with the 2016 Guidance Manual (https://www.pca.state.mn.us/sites/default/files/wq-iw1-04i.pdf , page 20), scores within the confident interval are considered potentially impaired and supporting information is utilized to help complete the assessment. In this case the poor number of species and overall fish indicated that the reach was not meeting aquatic life use.
09020303-556	Analysis of flow and dissolved oxygen records (including continuous DO from 2013) found that the reach fails to meet the 5 mg/l dissolved oxygen standard with or without flow.	The reach is impaired for fish bioassessments. The stressor identification process took into account the sonde information when determining the stressor(s). The discrete data that was available for assessments did not show impairment. The sonde data was received shortly before the PJG meeting and comments were made in that meeting regarding flow and the exceedances observed. Stressor identification linked the fish impairment to lack of base flow and low dissolved oxygen. The TMDL will address the fish impairment by addressing dissolved oxygen issues.

AUID(s)	Comment	Response
09020303-557	<p>The dissolved oxygen impairment from AUID 09020303-530 was carried forward to 09020303-558, but not to 09020303-557 when the reach was split. Analysis of dissolved oxygen records indicate impairment.</p>	<p>The documentation on why the DO listing did not carry forward to -557 was included in the comments and discussion for the Red Lake River Professional Judgment Group meeting. The assessment comments reviewed at the PJG meeting included: "The existing dissolved oxygen impairment from the now-retired, Parent AUID 09020303-530 should not be associated with this Child AUID. Data from this portion of the AUID only yielded a single oxygen exceedance out of 14 samples during the original listing data." The reason for this impairment listing only applying to -558 is because the original listing data, when split, did not indicate impairment on the -557 portion of the reach. The available data, at the time of the 2014 assessment (2004-2013), had 1 exceedance out of 41 samples. There were no early morning data available (pre-9 am). MPCA indicated that we had insufficient information to assess for dissolved oxygen in 2014. However, the correction was made because the original listing data did not indicate impairment. The downstream reach is still listed as impaired for dissolved oxygen and work to improve oxygen concentrations will be required on upstream reaches to meet the goal of the TMDL.</p>

AUID(s)	Comment	Response
09020303-560, 09020303-561, 09020303-562	There seems to be inconsistency and a lack of clarity in the application of the TSS standard for this reach.	<p>MPCA’s TSS standards were promulgated after the WAT/PJG meeting for this watershed. The original assessment for the parent WID 09020303-508 (encompassing -560, -561, and -562) utilized the 30 mg/L standard. This occurred in March of 2015. The reach was split in early 2016 and reassessed. The Technical Support Document for the TSS standards (https://www.pca.state.mn.us/sites/default/files/wq-s6-11.pdf) includes a map that shows the Red Lake River, upstream of Thief River Falls to be held to the North and downstream of Thief River Falls in the Central Region and just downstream of Fisher switching to the South region. Based on comments made during the public comment period for the TSS standards, it was determined that updates to the River Nutrient Regions for TSS purposes were supported. Revisions to the River Nutrient Region boundaries for TSS purposes were completed in March of 2016. Questions specific to this reach were addressed by MPCA staff and shared with the commenter on August 10, 2016 (see pages 20-22 of https://www.pca.state.mn.us/sites/default/files/wq-s6-18.pdf). These revisions specifically describe and illustrate the entirety of the Red Lake River as assigned to the Central Region for TSS assessment.</p> <p>MPCA uses a multi-parameter weight of evidence approach to aquatic life use assessments as described in the 2016 Guidance Manual. Data are used together to determine overall use support, and a single biological sample does not ‘always trump’ a decade of water quality data. On 09020303-560 two biological samples were used from two different years and 130 TSS samples were available over 10 years indicating the standard (30 mg/L) was being met. For 09020303-561 three fish and three invertebrate visits were used from multiple sites and years and 111 TSS data points over 10 years indicated the standard (30 mg/L) was met. For 09020303-562 four fish and three invertebrate samples were used from multiple stations and years; available TSS data (76 samples over 10 years) indicated the standard (30 mg/L) was being met.</p> <p>MPCA’s TSS standards are designed to be protective of aquatic life, rather than drinking water. We are currently working with the Minnesota Department of Health, however, to strengthen both our water quality standards and our ambient water quality assessments as they apply to the protection of drinking water.</p>

AUID(s)	Comment	Response
09020303-560, 09020303-561, 09020303-562	Does the MPCA operate under the assumption that a snapshot of biological data should always trump a decade of water chemistry data?	MPCA uses a multi-parameter weight of evidence approach to aquatic life use assessments as described in the 2016 Guidance Manual. Data are used together to determine overall use support, and a single biological sample does not 'always trump' a decade of water quality data. On 09020303-560 two biological samples were used from two different years and 130 TSS samples were available over 10 years indicating the standard (30 mg/L) was being met. For 09020303-561 three fish and three invertebrate visits were used from multiple sites and years and 111 TSS data points over 10 years indicated the standard (30 mg/L) was met. For 09020303-562 four fish and three invertebrate samples were used from multiple stations and years; available TSS data (76 samples over 10 years) indicated the standard (30 mg/L) was being met.
09020303-560, 09020303-561, 09020303-562	Sediment is a concern in respect to drinking water in the City of Thief River Falls. There is room for improvement in TSS levels along this reach.	MPCA's TSS standards are not intended to protect drinking water use or to improve processing at a drinking water facility. They were developed to be protective of aquatic life use. MPCA recommends that waters that are meeting standards are protected and measures are put in place to maintain quality.
09020306-507	The turbidity impairment should, technically, be delisted.	We agree. This reach will be corrected and the turbidity impairment removed from the 2018 Impaired Waters List.
09020306-522	Chlorpyrifos pesticides are polluting Grand Marais Creek. I think it would be irresponsible to delist the chlorpyrifos impairment.	We agree. MPCA has a chlorpyrifos impairment assigned to 09020306-522 is remaining on the 2016 Impaired Waters List.
09020306-513	The state's GIS layer's depiction of this reach has an error.	MPCA's linework has been corrected.