

# MIDDLE ST. CROIX WATERSHED MANAGEMENT ORGANIZATION

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## Regular Meeting of the Middle St. Croix Watershed Management Organization HELD REMOTELY DUE TO COVID -19 PANDEMIC

Attend ONLINE VIA ZOOM by clicking this link: <https://us02web.zoom.us/j/87055471602>

OR

Attend by CONFERENCE CALL by dialing +1 312 626 6799 – Meeting ID 870 5547 1602

Thursday, May 14<sup>th</sup>, 2020

6:00PM

1. Call to Order – 6:00PM
  - a. Approval of Agenda
2. Approval of Minutes
  - a. Draft minutes – April 9<sup>th</sup>, 2020 **pg. 1-5**
4. Treasurer’s Report
  - a. Report of savings account, assets for May 14<sup>th</sup>, 2020
  - b. Approve payment of bills for May 14<sup>th</sup>, 2020
5. Public Comment
6. Old Business
  - a. Draft MSCWMO Stormwater Treatment Credit Policy
7. New Business
  - a. 2019 MSCWMO Annual Water Monitoring Report **pg. 6-48**
  - b. MSCWMO-BWSR Lily Lake Alum Maintenance Agreement **pg. 7-55**
  - c. Washington County Cooperative Weed Management Area MOU **pg. 56-62**
8. Grant and Cost Share Applications
9. Plan Reviews/Submittals
  - a. Plan Review and Submittal Summary **pg.63-93**
    - i. 3<sup>rd</sup> and Myrtle Development-ACTION
    - ii. CenterPoint Energy Natural Gas – Quinlan Ave N.-ACTION
    - iii. Central Automotive -ACTION
  - b. Erosion and Sediment Control Inspection Reports **pg. 94-113**
10. Staff Report **pg. 114-116**
11. 1W1P Updates
12. Other
13. Adjourn

Middle St. Croix Watershed Management Organization Member Communities

Afton, Bayport, Baytown, Lakeland, Lakeland Shores, Lake St. Croix Beach, Oak Park Heights, St. Mary’s Point, Stillwater, & West Lakeland

Regular Meeting of the Middle St. Croix Watershed Management Organization  
HELD REMOTELY DUE TO COVID -19 PANDEMIC

Thursday, April 9th, 2020

6:00PM

Present: Brian Zeller, Lakeland Shores; John Fellego, Baytown Township; Dan Kylo, West Lakeland Township; Annie Perkins, City of Afton; Mike Runk, Oak Park Heights; Tom McCarthy, Lake St. Croix Beach; Dawn Bulera, Lake St. Croix Beach, Beth Olfelt-Nelson, St. Mary's Point; Joe Paiement, City of Lakeland, Ryan Collins, City of Stillwater; John Dahl, City of Bayport; Administrator Matt Downing. Mike Lyner, Lily Lake Association; Jon Whitcomb, permit applicant.

### **Call to Order**

The meeting was called to order at 6:00PM by Brian Zeller. Administrator Downing reminded the board that all votes require a roll call due to the meeting being held remotely.

### **Approval of Agenda**

Manager Fellego motioned to approve the agenda and Manager Runk seconded the motion. The motion passed on a roll call vote with all in favor.

### **Approval of Minutes**

Manager Olfelt-Nelson had a correction for the March 12<sup>th</sup> minutes on page 5. During a discussion about local, county, or 1W1P resources she meant to refer to John Parotti of SEH. Manager Olfelt-Nelson motioned to approve the March 12<sup>th</sup> minutes and Manager Fellego seconded the motion. The motion passed on a roll call vote with two abstentions, Managers Kylo and Zeller.

### **Treasurer's Report**

The treasurer's report was presented by Manager Kylo. The remaining checking account balance on April 9<sup>th</sup> 2020 was \$193,081.61. First State Bank CDs were valued at \$38,549.15. The ending balance in the RBC savings account for January 2020 is \$65,031.28. The ending balance in the RBC savings account for February 2020 is \$65,014.52.

Bills to be approved this month are: EOR: \$760.50; League of MN Cities: \$2,275.00, Washington Conservation District (Administration): \$ 2,567.00; Washington Conservation District (Technical Services): \$4,016.00; Total: \$9,618.50. Manager Fellego moved to accept the treasurer's report and pay the bills and Manager Collins seconded this motion. The motion passed on a roll call vote with all in favor.

### **Public Comment**

There was no public comment. Mike Lyner informed the board he was here for the Lily Lake discussion.

### **3M PFAS Reimbursement Request**

Our consultant at EOR has been reviewing documents and providing technical input on the development of the water supply groundwater model as part of the 3M PFAS settlement. Staff is

requesting reimbursement from MPCA totaling \$760.50 (EOR February). Administrator Downing informed the board he had requested a work done summary based on the boards request. The model is reaching a point of relevant MSCWMO information. Manager Runk moved to approve the reimbursement and Manager Fellegly seconded this motion. The motion passed on a roll call vote with all in favor.

### **Draft MSCWMO Stormwater Treatment Credit Policy**

Administrator Downing discussed the need for alternative treatment compliance after the recent cash-in-lieu of treatment issue the board faced. Having a policy in place would simplify the review and decision process. Administrator Downing brought examples for draft review that are closely modeled after CRWD and RWMWD, after finding VBWD's model too simple. Manager Olfelt-Nelson had some questions about the draft. She asked about the wording on the second page about cash contributions being referred to as the last step in the alternate sequence. She wants the wording should be changed to least preferred option to better and more strongly reflect the MSCWMO's position about cash-in-lieu of treatment. Administrator Downing agreed that the MSCWMO would rather have offsite mitigation logistics responsible by the party involved and explained that the wording "last step" was referring to the MIDS flowchart. Manager Zeller asked if the board needed to make a decision tonight. Administrator Downing said he would rather not rush but that the county was asking to use cash-in-lieu of treatment for one of their projects again. Manager Fellegly said he thinks the policy has everything the MSCWMO needs and that he thinks it should be on the books so there is no delay in project reviews. Manager Zeller asked if this option would be open to all developers or just public entities. Manager Downing said he had not found an answer to that yet, but that the board could consult their legal consultant. He said this was to be used as an internal reference document and that the authority remained with the board to use the document as guidance. Manager Zeller said he didn't think the board needed to make a decision tonight and that it shouldn't make the county need to wait on their process. Manager Runk asked if this was coming from the county asking where the money from the cash-in-lieu would be used. Administrator Downing said it was partly reactionary to having another possible project needing to utilize FTO #3. Manager Olfelt-Nelson requested a link to the report. Manager Runk asked to look into the limit to public entities question. Manager Downing will come back to the board if this question would result in a large legal cost. Manager Zeller motioned to table this draft and discussion until the next board meeting and Manager Fellegly seconded. The motion passed on a roll call vote with all in favor.

### **City of Stillwater Cooperative Agreement for Lily Lake Delisting**

Administrator Downing explained that because BWSR is requiring everything to be in place prior to releasing funds, he is rapidly attempting to draft an agreement with the City of Stillwater to bring to committee. BWSR needed assurance MSCWMO would have access to perform the alum treatment and can match funding. Stillwater has \$110,000 cash-in-kind and Administrator Downing was asking the board to contribute \$15,000 in 2020 and 2021. He hopes the maximum amounts will be lower in the end and feels comfortable with this proposal. He is also hoping for another form of match from the Lily Lake Association whether it be in-kind or cash. Manager Zeller noted that \$30,000 was 1/10 of the entire budget. Administrator Downing explained that \$15,000 is what the board sets aside for cost share projects annually and usually only ends up using \$1,000-3,000. The remaining funds usually gets shifted to other budget items such as TA or maintenance of MSCWMO projects. He explained that they were already able to cut out

\$50,000 from the initial basin design which reduced the required match. The CWF grants require a 20% match. Mike Lyner is the president of the Lily Lake Association; he said the group wants to meet water quality goals for the lake so that weed management is not necessary. He thinks they can reach a \$5,000 funding goal. The Lake association wants the lake improved and recognized as a jewel for the entire city, with a plan for the future use of the lake even if the public doesn't want to swim in it anymore. Administrator Downing explained that the planting of the basin is considered in-kind match and that previous work completed cannot be considered match. The MSCWMO is the lead on this project and responsible for the alum treatment through a consultant. Manager Zeller said he would be more comfortable with the MSCWMO contributing \$10,000. Administrator Downing suggested going forward with the \$15,000 this year, to provide BWSR with what they need, and not encumbering the \$15,000 next year. Manager Zeller confirmed with the group that they were comfortable with providing \$15,000 this year. Manager Zeller made this motion and Manager Perkins seconded it. The motion passed on a roll call vote with all in favor.

### **2019 Annual Watershed Report**

Although the 2019 audit is not complete yet due to complications from COVID-19, the report is required to be submitted to the state and posted online. Manager Fellego motioned to approve the report for submittal and posting on the website. Manager Olfelt-Nelson seconded this. The motion passed on a roll call vote with all in favor.

### **Perry Native Planting Cost Share Request**

Mr. Perry is applying for the Landscaping for Habitat grant. He would like to install a 300 sq ft native planting. His property is located on the corner of 3rd St S & Churchill in a very popular neighborhood in Stillwater where the project would provide a lot of educational opportunities. Mr. Perry has a lot of interest in creating pollinator habitat through the use of flowering shrubs and plants, and intends to install his project using organic site prep methods only. He is requesting a \$250 cost share grant for this project. Manager Zeller moved to approve this and Manager Fellego seconded the motion. The motion passed on a roll call vote with all in favor. Manager Zeller noted that \$250 was such a small grant it may not be providing much incentive for these types of projects. Administrator Downing explained that because it was just a native planting with no water quality benefit the amount is low, however the resident received the site visit and plan/design for free.

### **Oak Park Heights MCES Interceptor**

Administrator Downing exercised his authority to send the letter of approval so as to not delay the review process. OPH has not yet approved the projects but staff recommends approval. Manager Zeller motioned to approve this review and Manager Fellego seconded this. The motion passed on a roll call vote with all in favor.

### **Scanlan Garage and Driveway**

Manager Zeller commented that this project was a good demonstration of the value of quick conversations with the applicant. Administrator Downing was able to guide the applicant into understanding what was required and saved a lot of work. The board commended him for this. Manager Dahl motioned to approve the review, and Manager Runk seconded. The motion passed on a roll call vote with all in favor.

## **CSAH 5 Phase 2**

Administrator Downing explained that this was the new county project which was hoping to use the FTO 3/Cash-in-lieu of treatment. No action needed.

## **3rd and Myrtle Development**

Administrator Downing explained they were still working with the applicant to meet the MSCWMO rules. Manager Zeller explained that the project has many site constraints and the engineer is having difficulty working within those to meet the full requirements. He said based on the earlier conversation this is a good example of when having a process to mitigate difficult projects that are 95% of the way to meeting the requirements but are not quite there.

Administrator Downing explained that there was some disagreement with the engineer's calculations/soil and infiltration rate assumptions and the project is so far only achieving 39% capture. He is also working with the City of Stillwater and the BCWD to confirm calculations consistency with similar projects. Manager Zeller asked Administrator Downing to coordinate a meeting with them and Jon Whitcomb. Jon Whitcomb confirmed that he is excited for the project to move forward and to meet with the engineer on site.

## **Lakeland 2019 Street Improvements**

Manager Zeller asked Manager Paiement if the City was moving ahead with the project. He explained that it was a huge project that is dealing with big water issues. Administrator Downing explained that the MSCWMO usually stops involvement after the review and approval of the project but could provide ESC assistance. Manager Zeller noted that they are working with SEH.

## **Erosion and Sediment Control Inspection Reports**

Administrator Downing presented the ESC reports and noted that the first report went very well with the applicant responding and fixing any issues. The second inspection did not go very well and they are communicating with Dwayne and Jon in the community. The city staff will be following up with the applicant to get the site into compliance.

## **Staff Report**

Administrator Downing reported that the remote working procedure is a work in process. He is closing out two grants, Stillwater Country Club and Perro Creek, and that he has been involved in many meetings related to the two large grant processes. There have also been many preliminary/pre-application meetings.

## **1W1P Updates**

The board gave authority to Manager Fellegly two meetings ago to approve the draft 1W1P for the 60-day review period. The group is to bring any feedback on the draft to Manager Fellegly to report back to the 1W1P Policy Committee. Manager Olfelt-Nelson commented on how complicated the plan was and said she would ask her questions to Administrator Downing separately. Manager Fellegly said he appreciated all the work that went into the plan and the help it should provide to the northern half of the basin who has not had as much funding or work done. Administrator Downing said the board could submit their own comments. Manager's Olfelt-Nelson and Perkin's asked Administrator Downing for a bullet point synopsis of the plan. He said the summary page was a good place to start and gave his opinion on how he felt the

MSCWMO should approach the plan. He said due to the location of the MSCWMO in the basin, we will see the water quality benefit of any projects done upstream. There is also a higher cost for the same benefit for projects in the MSCWMO due to location. Because of this he did not feel that each board member needed to heavily scrutinize the draft plan. It will be too much work and there are much larger organizations involved with much more at stake than the MSCWMO. Manager Fellegly noted that there was not that much money at stake. Manager Zeller asked if there were any sections in particular to review. Administrator Downing said the 2-page summary that would be helpful. Manager Zeller asked how the MSCWMO would be affected by grant money in the future. Administrator Downing said the MSCWMO will likely not see much 1W1P funding early on in the process but that overall it will benefit them. Manager Fellegly agreed that this plan was as good as it was going to get and that the MSCWMO would get to be an equal voting member in the decisions to be made. Manager Olfelt-Nelson asked for clarification on the structure of the 1W1P planning groups and what will be the end result once the planning process is done. Administrator Downing explained that there will still be advisory groups to the and that the LSC Partners would likely be the same group of people form the policy committee planning process. Others in the basin can join the LSC partners who did not participate in the planning process at that point as well.

### **Adjourn**

Manager Fellegly moved to adjourn and Manager Dahl seconded this motion. The meeting adjourned at 7:27PM.

# Middle St. Croix Watershed Management Organization 2019 Water Monitoring Summary



Prepared For:



Prepared by:



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DRAFT



## ACKNOWLEDGEMENTS

Multiple agencies and individuals were directly involved in many aspects of this project, such as data collection and data analysis, as well as technical and administrative assistance.

### **Middle St. Croix WMO (MSCWMO) Board of Managers**

Annie Perkins  
John Dahl  
John Fellegy  
Brian Zeller, Chair  
Joe Paiement, Vice Chair  
Tom McCarthy, Secretary  
Mike Runk  
Beth Olfelt-Nelson  
Ryan Collins  
Dan Kyлло, Treasurer

### **Washington Conservation District**

Mike Isensee, MSCWMO Administrator  
Matthew Downing, Interim MSCWMO Administrator

### **Metropolitan Council**

Brian Johnson  
Mallory Vanous  
Mike Moger  
Sarah Voth

### **Minnesota Department of Natural Resources (MN DNR)**

Sandy Fecht

The WCD would also like to thank the volunteers and landowners who assist with data collection and access to our monitoring locations.

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## ABBREVIATIONS, ACRONYMS, AND SYMBOLS

Anoxic	Lacking oxygen
BCWD	Brown's Creek Watershed District
Benthic	The area nearest lake bed
Biweekly	Every two weeks
BMP	Best Management Practice
cf	cubic feet
cfs	cubic feet per second
Chl- $\alpha$	Chlorophyll- $\alpha$
DO	Dissolved Oxygen
<i>E. coli</i>	<i>Escherichia coli</i>
IESF	Iron Enhanced Sand Filter
Littoral zone	The area of a body of water where sunlight penetrates all the way to the sediment and allows aquatic plants (macrophytes) to grow
MCES	Metropolitan Council Environmental Services
mg/L	milligram per liter
mL	milliliter
MN DNR	Minnesota Department of Natural Resources
MPCA	Minnesota Pollution Control Agency
MPN	Most probable number
MSCWMO	Middle St. Croix Watershed Management Organization
NCHFE	North Central Hardwood Forest Ecoregion
OHW	Ordinary High Water level
SOP	Standard Operating Procedure
TKN	Total Kjeldahl Nitrogen
TMDL	Total Maximum Daily Load
TP	Total Phosphorus
TSI	Trophic State Index
TSMP	Trout Stream Mitigation Project
TSS	Total Suspended Solids
$\mu\text{g/L}$	micrograms per liter
$\mu\text{mhos/cm}$	micromhos per centimeter
WCD	Washington Conservation District

## **EXECUTIVE SUMMARY**

This report focuses on the summary and comparison of lake and stream water quality data collected by the Washington Conservation District (WCD) in 2019 as well as previous years. In 2019 the Middle St. Croix Watershed Management Organization (MSCWMO) monitored both water quality and water surface elevation on McKusick Lake and Lily Lake, flow and water quality at the Greeley Street Inlet to Lily Lake and Perro Creek at the Diversion Structure, water quality at Perro Creek at the Perro Pond Outlet, Perro Creek at 5<sup>th</sup> Avenue, Perro Creek at 9<sup>th</sup> Street, Perro Creek at 8<sup>th</sup> Street, Perro Creek at 6<sup>th</sup> Street, Perro Creek at 4<sup>th</sup> Street, Perro Creek at St. Croix Trail Downstream, Perro Creek at Central Avenue, and Perro Creek at 3<sup>rd</sup> Avenue. The purpose of this monitoring is to assess and document current water quality conditions of the lakes and streams, as well as continuing a long-term monitoring program that will enable the MSCWMO to identify trends associated with best management practice (BMP) implementation and land use changes in the watershed.

### **Lake Monitoring**

Lily Lake was classified as eutrophic and received a B- grade in 2019 (APPENDIX A). No samples exceeded the Minnesota Pollution Control Agency's (MPCA) standard for total phosphorus (TP), six samples exceeded the MPCA standard for chl- $\alpha$  corrected for pheophytin, four Secchi disk transparency readings exceeded the MPCA standard (APPENDIX A).

In 2019 McKusick Lake was classified as eutrophic and received a grade of B- (APPENDIX A). Three samples exceeded the MPCA shallow lake standard for TP. No samples exceeded the MPCA standard for chl- $\alpha$  corrected for pheophytin and no Secchi disk transparency measurements exceeded the MPCA shallow lake standard (APPENDIX A).

### **Stream and Stormwater Monitoring**

In 2019 monitoring continued on the Greeley Street catchment of Lily Lake. The total discharge was the highest recorded at the site and was more than double the recorded discharge of 2018 (Figure 8 and Figure 9). The Greeley Street catchment base flow grab samples had

concentrations below standards of TP and total suspended solids (TSS), and were similar to results in past years (Table 5 and Table 6). As in previous years the storm event grab sample result was higher than base samples. Sample results confirm previous results that the majority of loading to Lily Lake occurs during storm events.

The MSCWMO continued monitoring Perro Creek to identify where the greatest contribution of pollutants to the Saint Croix River was occurring. In 2019 Perro Creek at the Diversion Structure was the only site on Perro Creek monitored for TSS, total Kjeldahl nitrogen (TKN), TP, and *E. coli*. *E. coli* was also collected at several other locations along Perro Creek at the Perro Pond Outlet, Perro Creek at 5th Avenue, Perro Creek at 9<sup>th</sup> Street, Perro Creek at 8<sup>th</sup> Street, Perro Creek at 6<sup>th</sup> Street, Perro Creek at 4<sup>th</sup> Street, Perro Creek at St. Croix Trail Downstream, Perro Creek at Central Avenue, and Perro Creek at 3<sup>rd</sup> Avenue.

Perro Creek at the Diversion Structure sample results were on average higher than 2018, but base flow sample results were lower than storm samples, as expected (Table 7 and Table 8). *E. coli* results were high for all sites on Perro Creek during the storm event on 9/12/2019, with eight of the ten sites at or exceeding the standard testing limit of 2,420 most probable number of organisms (MPN) per 100/ml (Table 9). According to MPCA standards, Perro Creek is exceeding impairment standards at 6<sup>th</sup> Street in June and September (Table 10). Additional samples were collected at four of the ten locations to determine if human fecal DNA was present, with two samples resulting in positive detections at the 3<sup>rd</sup> Avenue site (Table 11).

The Brown's Creek Diversion Structure site, which exports to McKusick Lake, showed an increase in discharge in 2019, the highest ever recorded, to 112,468,888 cubic feet (cf) from 45,453,990 cf in 2018. The phosphorus load increased from 964 lbs. in 2018 to 3,598 lbs. in 2019. TSS export also increased from the Brown's Creek Diversion Structure to McKusick Lake, from 505,314 lbs. in 2018 to 2,707,186 lbs. in 2019 (Table 2 and Table 3). The TP and TSS loads were the highest ever recorded. A likely source of the high TP and TSS loads in the diversion drainage is the large number of head cuts on all three tributary branches of the drainage, upstream of the monitoring location. As with most past years, exceedances of metal

standards occurred frequently. Sources of metals for the Brown's Creek Diversion Structure site likely include improperly disposed waste, such as deep cycle batteries.

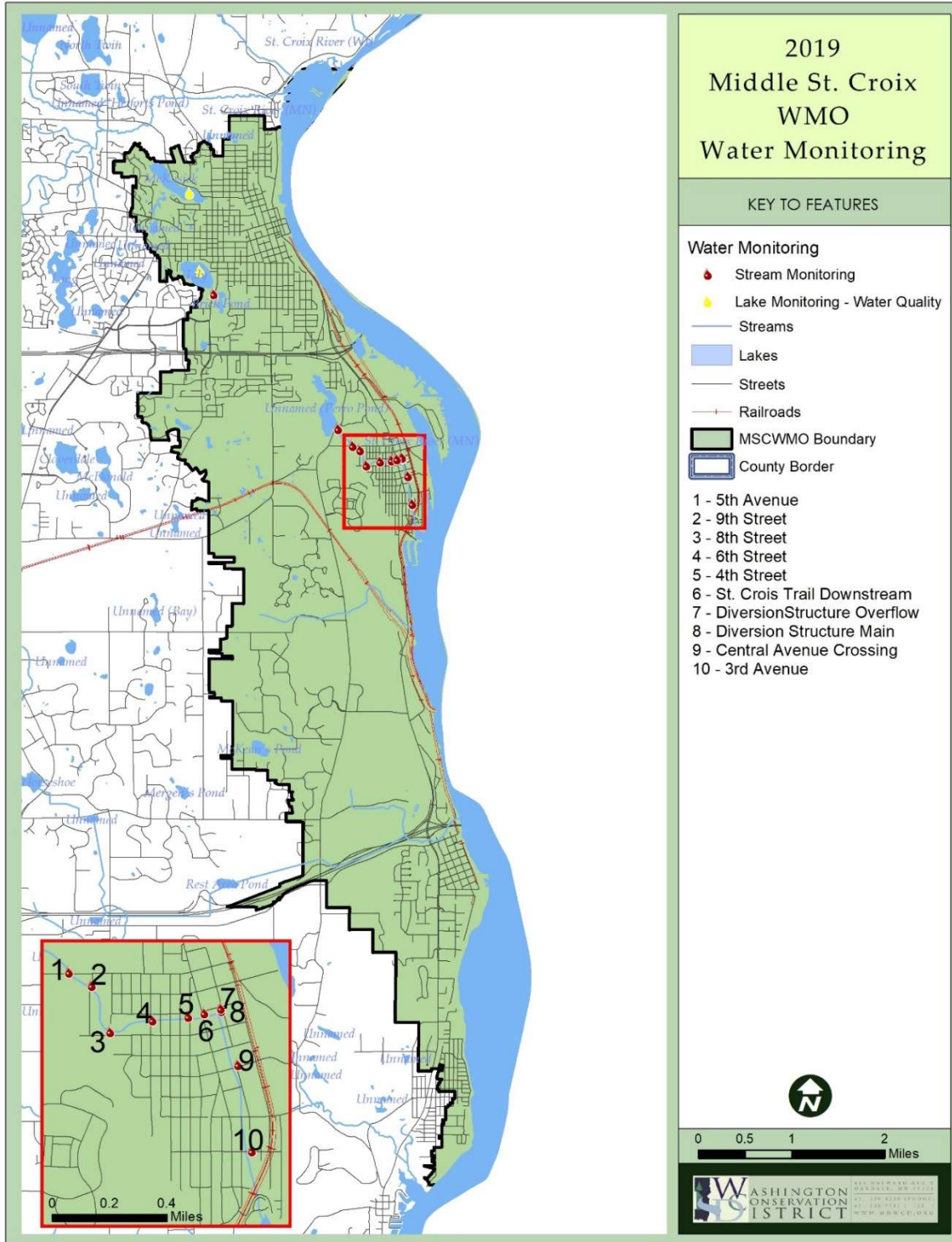


Figure 1. MSCWMO 2019 Water Monitoring Locations

## LAKE MONITORING

### A. METHODS, RESULTS AND DISCUSSION

In 2019 water quality data was collected biweekly on Lily Lake and McKusick Lake, over seven consecutive months (April–October) by the Washington Conservation District. Measurements obtained during the summer sampling season (June–September) are averaged for a comparison of individual lake dynamics from year to year between lakes within the watershed and to the Minnesota Pollution Control Agency’s (MPCA) impairment standards. Lake grades are based on the averages of samples collected May–September. Average values for all parameters are presented in APPENDIX A and Figure 4 through Figure 7, which show the current and historic summer averages for each parameter. Water quality samples were collected by the WCD with a two-meter (6.56 feet) integrated surface water column sampler. A full description of WCD Standard Operating Procedures is available on the Washington Conservation District website at <http://www.mnwcd.org/water-quality-water-monitoring/>. The Metropolitan Council Environmental Services (MCES) Laboratory analyzed the surface water samples for TP, chl- $\alpha$ , and TKN.

Total phosphorus is analyzed as it is a major nutrient involved in the eutrophication of lakes and is generally associated with the growth of aquatic plants and/or algal blooms. Common sources of phosphorus include runoff from agricultural fields, livestock areas, urban areas, lakeshore lawns, and improperly operating septic systems. With most lakes in this region, phosphorus is the least available nutrient; therefore, its abundance, or scarcity, controls the extent of algal growth. Excess algal growth, in turn, negatively affects the clarity, or transparency, and ability of light to penetrate the water. The MPCA sets lake eutrophication standards for aquatic life and recreation. The standard for TP is 0.040 mg/L for deep lakes and 0.060 mg/L for shallow lakes. In general, shallow lakes are defined as less than 15 feet deep, with greater than 80% littoral area, and less than 10 acres. The 2019 summer average of TP values of MSCWMO lakes can be found in Figure 4.

Chlorophyll- $\alpha$  is measured as it is the photosynthetic component found in algae and aquatic plants and is an indicator of algal productivity. The MPCA standard for pheophytin-corrected

chl- $\alpha$  is 14  $\mu\text{g/L}$  for deep lakes and 20  $\mu\text{g/L}$  for shallow lakes. The 2019 summer average chl- $\alpha$  concentrations of MSCWMO lakes can be found in Figure 5.

TKN, the sum of organic nitrogen and ammonia, was analyzed in MSCWMO lakes. While no standard exists for TKN because TP is often the limiting nutrient, TKN can contribute to eutrophication. The 2019 summer average TKN concentrations of MSCWMO lakes can be found in Figure 6.

Field measurements are recorded while collecting lake samples, including Secchi disk transparency. The measurement of light penetration using a Secchi disk gives a simple measure of water transparency, or clarity. A reduction in water transparency is typically the result of turbidity composed of suspended sediments, organic matter and/or phytoplankton (algae). The MPCA standard for Secchi disk transparency is 1.4 meters for deep lakes and 1.0 meter for shallow lakes.

User perception and physical/recreational suitability of lakes were recorded, along with temperature and dissolved oxygen (DO) profile measurements taken by the WCD during each sampling event. Profiles are recorded at one meter increments from the water surface to the lake bottom. The data show the extent of summer stratification and are useful in identifying the development of a thermocline (the layer of water in which the temperature rapidly declines). As a lake stratifies, the water column becomes more stable and mixing is less likely to occur. If mixing occurs during the growing season, nutrients from the lake bottom become available and can result in increased algal production. Lake DO profile data is useful in determining excessive production (algae/plants) in a lake. Increased production creates more DO, for a time, but as plants and algae die off and decay, the bacteria that decompose them consume DO. Low DO conditions may stress fish populations and under anoxic conditions nutrients may be released from the sediment. Data collected from the rankings and profiles are contained in a database at the WCD, and can be obtained by request, as well as on the MPCA website at <http://cf.pca.state.mn.us/water/watershedweb/wdip/index.cfm>.



A lake grading system is used in this summary, to allow for a better understanding of lake water quality data and to aid in the comparison of lakes. The lake water quality grading system was developed following the 1989 sampling season by MCES. The concept of the lake grading system is a ranking of water quality characteristics by comparing measured values to those of other metro area lakes. The grading system represents percentile ranges for three water quality indicators: the May through September average values of TP, uncorrected trichromatic chl- $\alpha$ , and Secchi disk transparency. These percentiles use ranked data from 119 lakes sampled from 1980-1988 and are shown in Table 1. This method has since been replicated and the grading system has been verified with more recent data. The variables used in the grading system strongly correlate to open-water nuisance aspects of a lake (i.e. algal blooms), which can indicate accelerated aging (cultural eutrophication). There is a strong correlation when comparing trophic status to the lake grade. Summaries of all lake results are presented in APPENDIX A.

**Table 1. Lake Grade Ranges**

<b>Grade</b>	<b>Percentile</b>	<b>TP (<math>\mu\text{g/L}</math>)</b>	<b>Chl-<math>\alpha</math> (<math>\mu\text{g/L}</math>)</b>	<b>SD (m)</b>
A	<10	<23	<10	>3.0
B	10-30	23-32	10-20	2.2-3.0
C	30-70	32-68	20-48	1.2-2.2
D	70-90	68-152	48-77	0.70-1.2
F	>90	>152	>77	<0.70

There are several metrics and systems that can also be used to assess lakes including the Carlson Trophic State Index (TSI) and ecoregion values. The Carlson Trophic State Index is used to quantify the relationship between water quality data and trophic status. Trophic states vary from oligotrophic (low biological activity and high clarity) to hypereutrophic (highly productive with very low clarity). The MSCWMO is located in the North Central Hardwood Forest Ecoregion where lakes are often mesotrophic. Ecoregion values are assigned for TP, TKN, chl-  $\alpha$ , and Secchi disk transparency. This report will focus on the methods used by the MPCA and the Metropolitan Council, as previously discussed.

Water elevation monitoring was conducted on two lakes, McKusick and Lily, from April to October 2019. Lake elevation readings are compared to the lake's Ordinary High Water level (OHW)<sup>1</sup>. The OHW for Lily and McKusick Lakes are 844.8 ft. and 851.7 ft., respectively. Changes in lake water elevation are often attributed to the changes in precipitation. The highest recorded elevation in 2019 for Lily Lake occurred on 8/19/2019 at 846.75 ft. and on 5/23/2019 at 855.01 ft. for McKusick Lake. Complete lake elevation data for 2019 can be found in Figure 2 and Figure 3. For historical lake elevations, visit the MN DNR Lake Finder webpage at <http://www.dnr.state.mn.us/lakefind/index.html>.

## 1. LILY LAKE

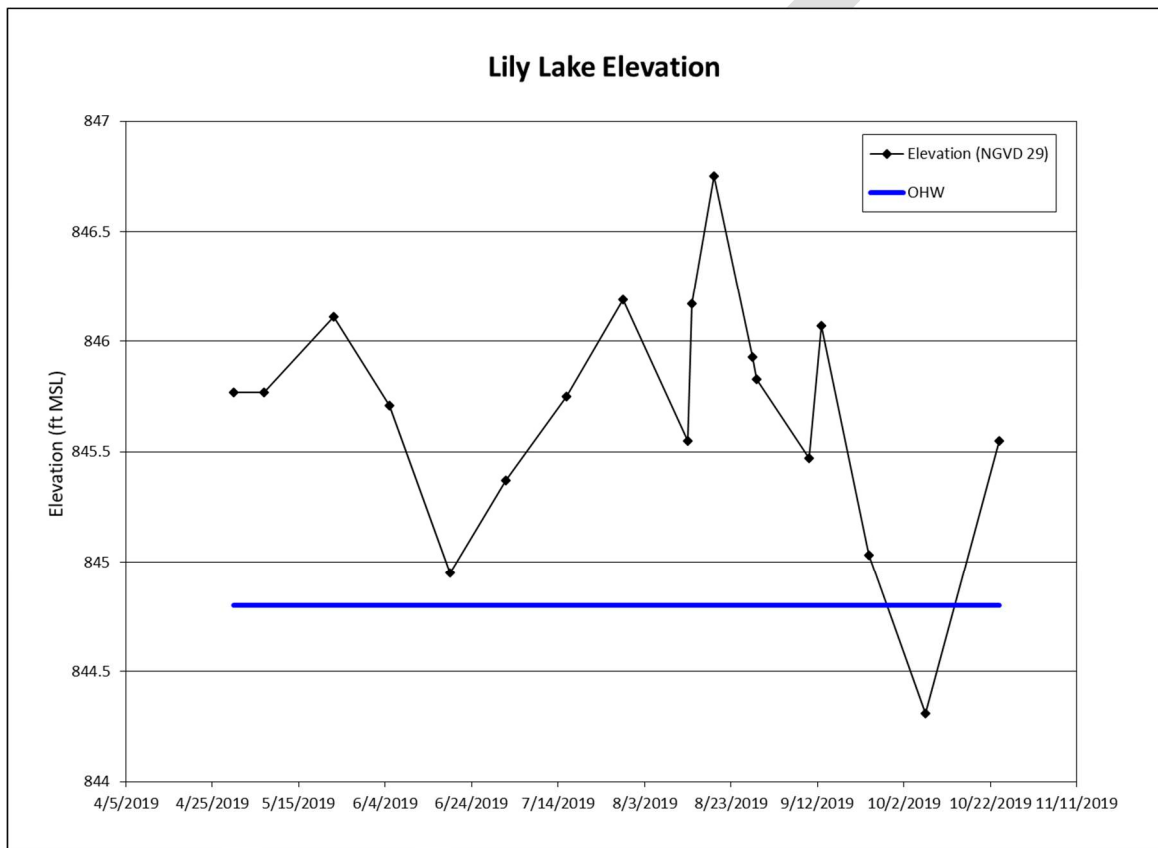
In 2019 WCD staff conducted two-tailed Kendall's Tau statistical analysis based on data collected by professional agencies for both lakes monitored in MSCWMO to determine trends for TP, Secchi, and chl- $\alpha$  ( $p < 0.05$ ). Lily Lake had a statistically significant improving trend for TP, a statistically significantly declining trend for chl- $\alpha$  and no trend was found for average Secchi disk transparency. Lily Lake had an average summertime TP concentration of 0.031 mg/L, which was lower than 2018 (Figure 4). None of the summertime results were greater than the MPCA lake nutrient impairment standard for TP. The 2019 average summertime concentration of chl- $\alpha$  was 21.5  $\mu\text{g/L}$ , lower than the 22.6  $\mu\text{g/L}$  measured in 2018 (Figure 5). Six of the nine water quality results for chl- $\alpha$  impairment exceeded the MPCA lake standard (APPENDIX A). Lily Lake had an average summertime TKN concentration of 0.91 mg/L in 2019; lower than the 1.07 mg/L in 2018 (Figure 6). Secchi disk readings were measured in 2019 with a summertime average of 1.85 meters (Figure 7), with four of the nine water quality readings exceeding the MPCA lake standard for Secchi disk transparency (APPENDIX A). Lily Lake received a grade of B- in 2019 which was the same as 2018. Temperature and DO profiles

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<sup>1</sup> Minnesota State Statutes defines the ordinary high water level (OHW) as follows: Minnesota Statutes 103G.005 Subd. 14. Ordinary High Water Level. "Ordinary high water level" means the boundary of water basins, watercourses, public waters and public waters wetlands, and: The ordinary high water level is an elevation delineating the highest water level that has been maintained for a sufficient period of time to leave evidence upon the landscape, commonly the point where the natural vegetation changes from predominantly aquatic to predominantly terrestrial;

- 1) For watercourses, the ordinary high water level is the elevation of the top of the bank of the channel; and
- 2) For reservoirs and flowages, the ordinary high water level is the operating elevation of the normal summer pool.

indicate that Lily Lake exhibited thermal stratification during the summer months with the thermocline between 4 and 5 meters; therefore the lake was less likely to completely mix throughout the summer. Lily Lake was below the OHW for one elevation reading, falling to its lowest recorded level of the monitoring season on 10/7/2019 with an elevation of 845.68 ft. The elevation was above the OHW for most of the monitoring season, reaching its highest recorded level on 8/19/2019 with a level of 846.75 ft. (Figure 2). A summary of all lake results is presented in APPENDIX A.

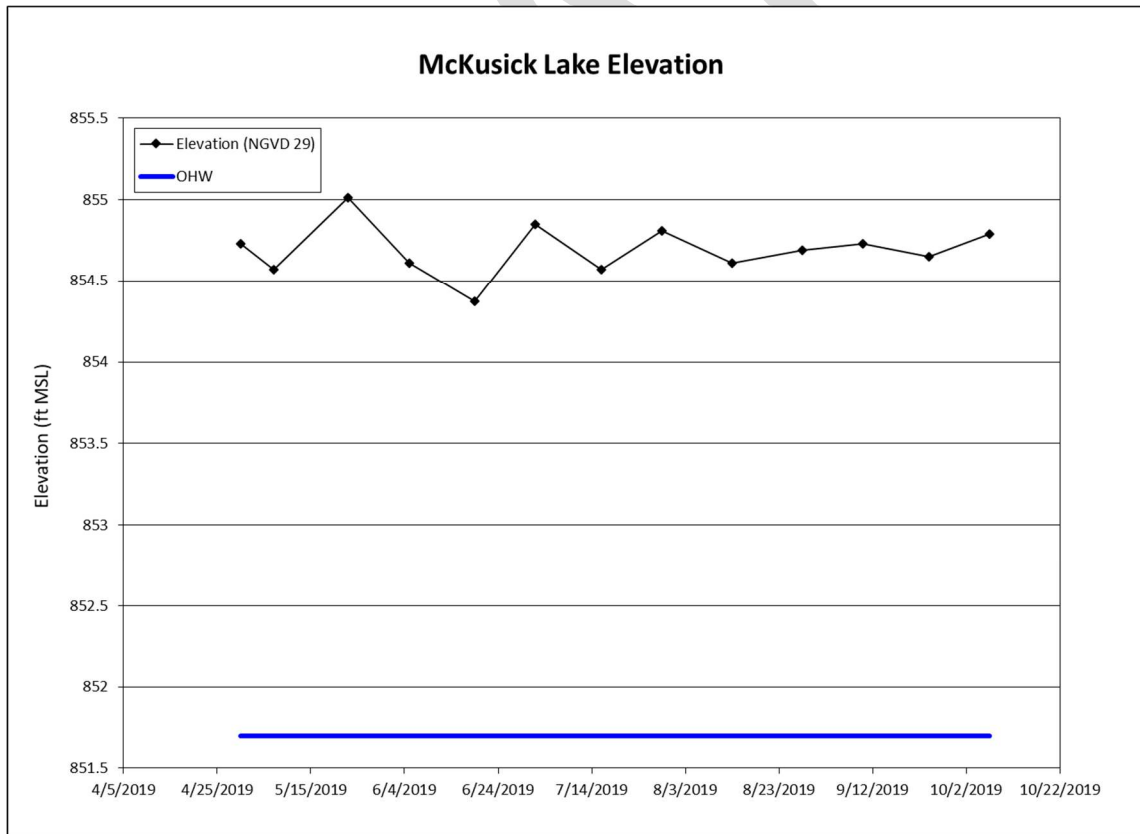


**Figure 2. Lily Lake 2019 Elevations**

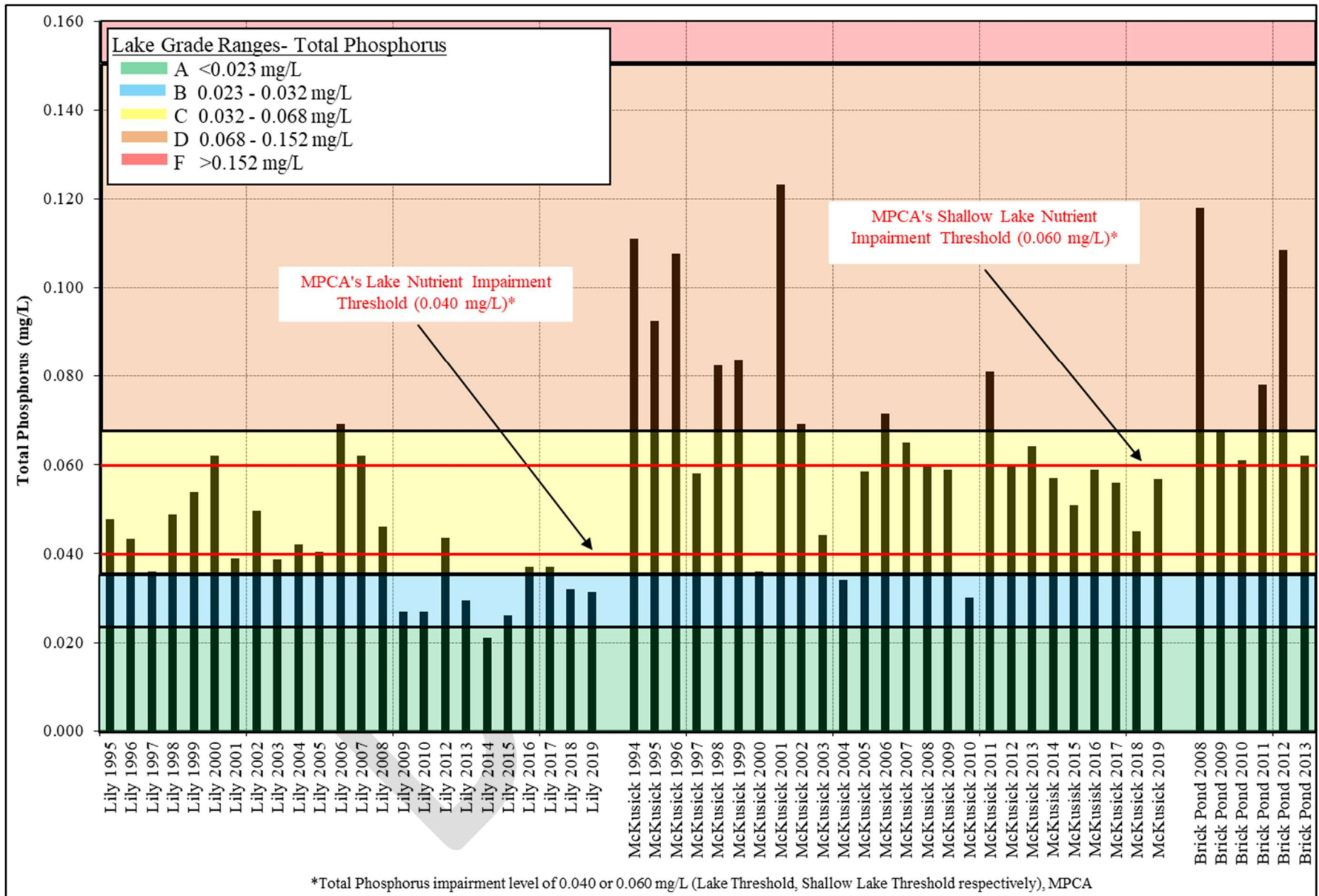
## 2. MCKUSICK LAKE

A two-tailed Kendall’s Tau analysis based on data collected by professional agencies showed that McKusick Lake has statistically significant ( $p < 0.05$ ) improving trends for TP and Secchi transparency, and no trend is present for chl- $\alpha$ . The McKusick Lake summertime average TP concentration in 2019 was 0.057 mg/L; higher than the 0.045 mg/L observed in 2018 (Figure 4), with three of the nine summertime water quality samples exceeding the MPCA TP impairment standard for shallow lakes (APPENDIX A). McKusick Lake had a summertime average chl- $\alpha$

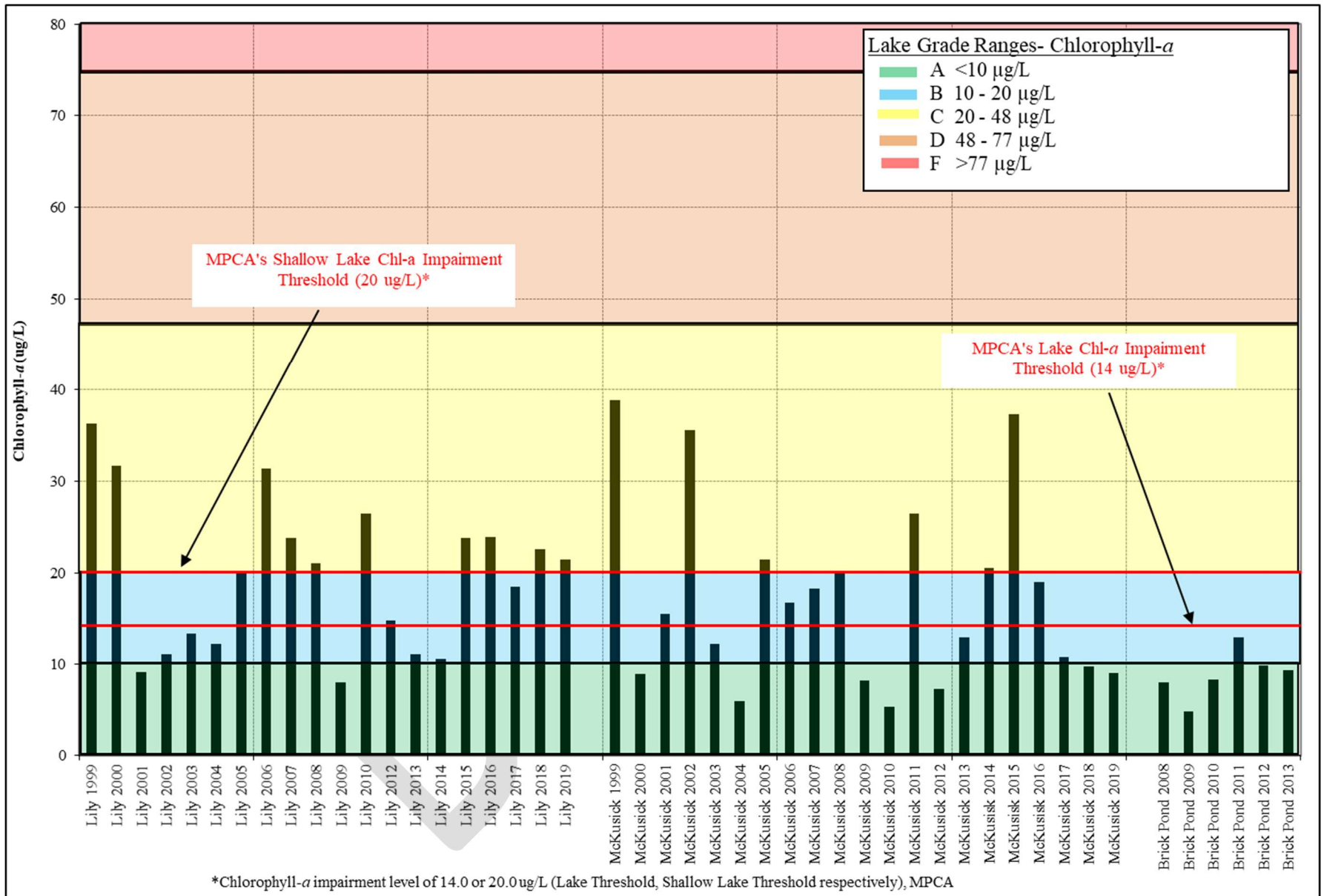
concentration of 9.1  $\mu\text{g/L}$ ; lower than the chl- $\alpha$  average of 9.8  $\mu\text{g/L}$  from 2018 (Figure 5). None of the nine summertime samples collected in 2019 exceeded the MPCA shallow lake standard for chl- $\alpha$ . The average summertime TKN concentration for 2019 was 0.71 mg/L; lower than the 0.78 mg/L measured in 2018 (Figure 6). The 2019 summertime average water transparency measured by Secchi disk was 1.69 meters (Figure 7). Five of the nine summertime Secchi disk readings in 2019 were worse than the MPCA shallow lake impairment standard. McKusick Lake received a grade of a B- in 2019, an improvement from the C+ it received from 2016 to 2018. Temperature and DO profiles indicate that McKusick Lake exhibited thermal stratification during the summer months in the deepest portion of the lake with the thermocline around 3 meters. A majority of McKusick Lake is very shallow and does not stratify, and therefore is likely to have mixed throughout the summer. The elevation of McKusick Lake remained above the OHW for the entire monitoring season, reaching its highest recorded level of the season on 5/23/2019 with a level of 855.01 ft. and the lowest recorded level of the season occurred on 6/19/2019 with an elevation of 854.69 ft. (Figure 3). A summary of all lake results is presented in APPENDIX A.



**Figure 3. McKusick Lake 2019 Elevations**



**Figure 4. MSCWMO Historic Summer Average Total Phosphorus**



**Figure 5. MSCWMO Historic Summer Average Chlorophyll-*a***

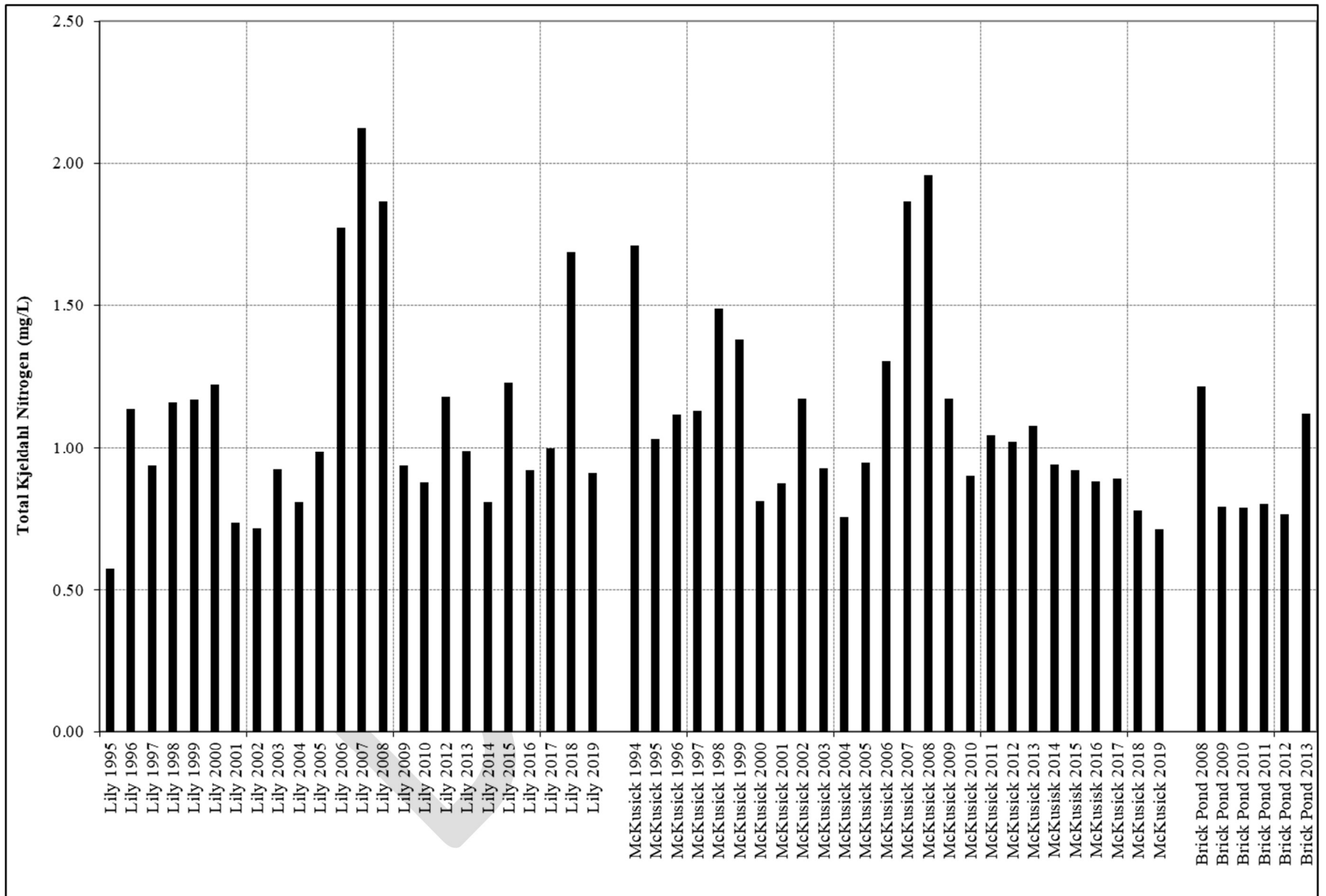
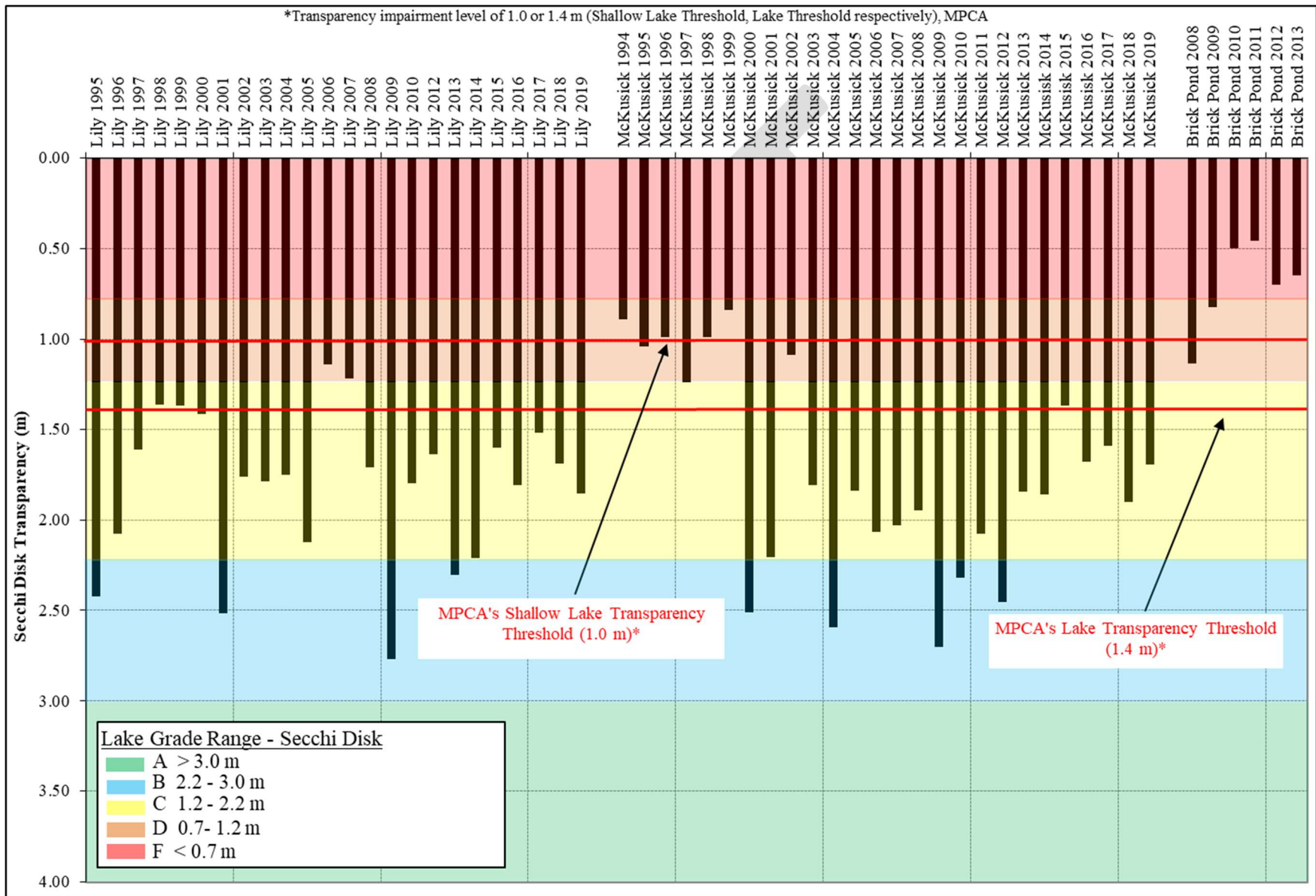


Figure 6. MSCWMO Historic Summer Average Total Kjeldahl Nitrogen



**Figure 7. MSCWMO Historic Summer Average Secchi Disk Transparency**



### 3. BROWN'S CREEK DIVERSION STRUCTURE

As part of Brown's Creek Watershed District's long term monitoring, the WCD collected grab samples and automated flow-weighted samples during both base flow and storm event conditions at the Brown's Creek Diversion Structure for BCWD in 2019, and that data is provided to the MSCWMO. The City of Stillwater constructed the diversion structure in June of 2003, as part of the completion of the Trout Stream Mitigation Project (TSMP). It has been functioning to divert water from the 1,800-acre annexation area away from Brown's Creek through McKusick Lake, and ultimately to the St. Croix River. While this diversion structure keeps the warmer urban stormwater runoff from the southern tributary out of the temperature and nutrient sensitive Brown's Creek Ravine, it means that this is discharged to McKusick Lake, and could affect the lake water quality. Data collected at this site by the WCD includes continuous stage and total discharge, and water quality samples analyzed for nutrients, sediment, and metals. No bacteria samples were collected at the site in 2019. Discharge increased from 2018 to 2019, and was the highest ever recorded, with a volume of 112,468,888 cubic feet exported to McKusick Lake (Table 2 and Table 3). All stream flow and chemistry data from 2019 can be found in Table 2 through Table 4.

The TP and TSS load to McKusick Lake was the highest ever recorded at 3,598 pounds of phosphorus and 2,707,186 pounds of sediment, equating to 0.933 and 702.25 pounds per acre of watershed land, respectively (Table 2 and Table 3). The head cut near Boutwell Avenue identified as a major source of high TP and TSS loads in prior monitoring summaries was repaired in November 2018, and was expected to significantly reduce nutrient loads in the drainage. However, a spring drone flight and field investigations by the BCWD's engineer found a large number of additional head cuts on all three tributary branches of the drainage that were likely produced or aggravated by excess runoff. To help lower phosphorus loading in the subwatershed there is an Iron Enhanced Sand Filter (IESF) upstream of the monitoring site.

In 2019 there were a number of metal standard exceedances. Exceedances are based on the MPCA metal standards. The calculation of metal standards are described in the Minnesota Administrative Rules Part 7050.0222 and are divided into three categories of toxicity; chronic,

maximum, and final acute value (FAV). The chronic standard protects organisms from long term exposure to a pollutant with minimal effects, the maximum standard from short term exposure with no or little mortality, and the FAV is the concentration at which mortality can be expected. As in past years copper continues to be an issue; one sample exceeded the final acute value, four samples exceeded the maximum standard, and one exceeded the chronic standard. The maximum standard for zinc was exceeded by two samples, and eight chronic standard exceedances of lead were recorded. A summary of metals results can be seen in (Table 4). The occurrence of heavy metal exceedances exported to McKusick Lake and its wetland complex are particularly concerning due to the potential to kill aquatic life at high concentrations, as opposed to nutrient or sediment loading which typically degrades habitat and populations of aquatic life over time. One possible source of these elevated metals is the erosion that is occurring upstream of the site. Additional sources may be from unseen deposits of improperly disposed waste, such as batteries.

**Table 2. Brown's Creek Diversion Structure Drainage Historical Annual Discharge and Loading Amounts**

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
<b>Brown's Creek Diversion Structure</b>										
Discharge (cf)	38,197,468	52,981,553	21,810,789	46,435,271	53,519,017	46,276,327	70,780,581	39,625,672	45,453,990	112,468,888
Total pounds of Phosphorus exported	608	2,099	251	527	392	1,837	1,574	784	964	3,598
TP (lbs/ac/yr)	0.158	0.544	0.065	0.137	0.102	0.447	0.408	0.203	0.250	0.933
Total pounds of TSS exported	353,007	1,387,050	127,435	211,977	99,532	1,008,346	1,533,496	596,382	505,314	2,707,186
TSS (lbs/ac/yr)	91.57	359.81	33.06	54.99	25.82	261.57	397.79	154.70	131.08	702.25

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**Table 3. Brown's Creek Diversion Structure Drainage 2019 Total Suspended Solids (TSS) and Total Phosphorus (TP) Loading**

Sample Type	Sample Collection Time		Loading Interval		Interval Volume (cf)	Interval Volume (ac-ft)	Interval TSS (lb)	Interval TP (lb)		
	Start	End	TSS (mg/L)	TP (mg/L)					Start	End
Base*			10	0.073	1/1/2019 0:00	3/13/2019 15:00	3,094,200	71.07	1,932	14.10
Snowmelt Grab*	3/14/2019 11:20	3/14/2019 11:20	135	0.585	3/13/2019 15:00	3/16/2019 5:00	2,455,200	56.39	20.691	89.66
Base*			10	0.073	3/16/2019 5:00	3/20/2019 15:00	2,480,400	56.97	1,348	11.30
Snowmelt*			104	0.404	3/20/2019 15:00	3/28/2019 0:00	8,156,160	187.34	52,952	205.70
Snowmelt Grab*	3/28/2019 9:05	3/28/2019 9:05	73	0.222	3/28/2019 0:00	3/28/2019 16:00	316,800	7.28	1,444	4.39
Base*			10	0.073	3/28/2019 16:00	4/6/2019 5:00	2,214,000	50.85	1,382	10.09
Storm*			2,140	2.613	4/6/2019 5:00	4/7/2019 4:00	703,800	16.17	94,022	114.80
Base*			10	0.073	4/7/2019 4:00	4/14/2019 11:00	1,890,000	43.41	1,180	8.61
Snowmelt*			104	0.404	4/14/2019 11:00	4/17/2019 12:00	1,314,000	30.18	8,531	33.14
Storm*			2,140	2.613	4/17/2019 12:00	4/18/2019 7:00	560,880	12.88	74,929	91.49
Base*			10	0.073	4/18/2019 7:00	4/22/2019 6:00	1,710,000	39.28	1,067	7.79
Storm*			2,140	2.613	4/22/2019 6:00	4/23/2019 1:00	581,400	13.35	77,670	94.84
Base*			10	0.073	4/23/2019 1:00	5/1/2019 15:15	2,227,500	51.16	1,391	10.15
Base			10	0.073	5/1/2019 15:15	5/8/2019 10:15	1,268,180	29.13	792	5.78
Storm Composite	5/8/2019 15:52	5/9/2019 8:32	2,900	3.280	5/8/2019 10:15	5/9/2019 9:15	701,522	16.11	127,001	143.64
Base			10	0.073	5/9/2019 9:15	5/18/2019 4:15	3,532,830	81.60	2,218	16.19
Storm			2,140	2.613	5/18/2019 4:15	5/18/2019 11:15	84,850	1.95	11,335	13.84
Base			10	0.073	5/18/2019 11:15	5/19/2019 1:15	158,400	3.64	99	0.72
Storm Composite <sup>2</sup>	5/19/2019 6:05	5/19/2019 23:39	7,960	3.850	5/19/2019 1:15	5/20/2019 0:15	512,955	11.78	254,894	123.28
Base			10	0.073	5/20/2019 0:15	5/21/2019 18:15	918,738	21.10	574	4.19
Storm Composite	5/21/2019 22:47	5/22/2019 8:24	2,600	3.020	5/21/2019 18:15	5/22/2019 13:15	561,047	12.89	91,062	105.77
Base			10	0.073	5/22/2019 13:15	5/27/2019 7:15	2,227,570	51.16	1,391	10.15
Storm Composite	5/27/2019 14:36	5/28/2019 4:19	1,380	2.370	5/27/2019 7:15	5/28/2019 6:15	1,176,670	27.03	101,368	174.09
Base Grab	5/30/2019 14:02	5/30/2019 14:02	15	0.090	5/28/2019 6:15	5/31/2019 14:15	3,315,590	76.16	3,105	18.63
Base			10	0.073	5/31/2019 14:15	6/24/2019 0:15	3,559,190	81.75	2,222	16.22
Storm			2,140	2.613	6/24/2019 0:15	6/24/2019 18:15	132,052	3.03	17,641	21.54
Base Grab	6/25/2019 9:35	6/25/2019 9:35	16	0.130	6/24/2019 18:15	6/27/2019 10:15	267,863	6.15	268	2.17
Storm			2,140	2.613	6/27/2019 10:15	6/27/2019 16:15	33,229	0.76	4,439	5.42
Base			10	0.073	6/27/2019 16:15	6/30/2019 7:15	244,644	5.62	153	1.11
Base			2,140	2.613	6/30/2019 7:15	6/30/2019 19:15	76,374	1.75	10,203	12.46
Base			10	0.073	6/30/2019 19:15	7/1/2019 19:15	161,028	3.70	101	0.73
Storm Composite	7/1/2019 20:45	7/2/2019 7:58	1,510	2.890	7/1/2019 19:15	7/2/2019 8:15	438,282	10.07	41,314	79.07
Base			10	0.073	7/2/2019 8:15	7/9/2019 15:15	1,794,140	41.21	1,120	8.18
Storm			2,140	2.613	7/9/2019 15:15	7/9/2019 24:15	69,938	1.61	9,343	11.41
Base			10	0.073	7/9/2019 24:15	7/14/2019 24:15	822,127	18.88	513	3.75
Storm			2,140	2.613	7/14/2019 24:15	7/15/2019 3:15	24,540	0.56	3,278	4.00
Base			10	0.073	7/15/2019 3:15	7/15/2019 18:15	53,280	1.22	33	0.24
Storm			2,140	2.613	7/15/2019 18:15	7/16/2019 1:15	122,005	2.80	16,299	19.90
Base			10	0.073	7/16/2019 1:15	7/20/2019 8:15	1,101,730	25.31	688	5.02
Storm Composite	7/20/2019 9:49	7/20/2019 19:09	977	1.220	7/20/2019 8:15	7/20/2019 19:15	233,832	5.37	14,261	17.81
Base Grab	7/23/2019 14:53	7/23/2019 14:53	16	0.088	7/20/2019 19:15	7/26/2019 20:15	1,635,570	37.57	1,634	8.99
Storm			2,140	2.613	7/26/2019 20:15	7/27/2019 5:15	122,616	2.82	16,381	20.00
Base			10	0.073	7/27/2019 5:15	8/13/2019 17:15	2,720,430	62.49	1,698	12.40
Storm Composite	8/13/2019 18:13	8/13/2019 22:37	2,750	2.900	8/13/2019 17:15	8/14/2019 3:15	313,193	7.19	53,766	56.70
Base			10	0.073	8/14/2019 3:15	8/16/2019 3:15	1,258,680	28.91	786	5.74
Storm			2,140	2.613	8/16/2019 3:15	8/16/2019 9:15	301,081	6.92	40,222	49.11
Base			10	0.073	8/16/2019 9:15	8/16/2019 14:15	256,125	5.88	160	1.17
Storm			2,140	2.613	8/16/2019 14:15	8/16/2019 22:15	477,398	10.97	63,777	77.87
Base			10	0.073	8/16/2019 22:15	8/18/2019 2:15	1,440,180	33.08	899	6.56
Storm			2,140	2.613	8/18/2019 2:15	8/19/2019 4:15	3,459,330	79.46	462,139	564.28
Base			10	0.073	8/19/2019 4:15	8/25/2019 13:15	3,984,960	137.47	3,736	27.27
Base Grab	8/26/2019 13:31	8/26/2019 13:31	6	0.063	8/25/2019 13:15	8/26/2019 14:15	277,879	6.38	104	1.09
Storm			2,140	2.613	8/26/2019 14:15	8/26/2019 19:15	108,016	2.48	14,430	17.62
Base			10	0.073	8/26/2019 19:15	9/2/2019 22:15	1,903,130	43.71	1,188	8.67
Storm			2,140	2.613	9/2/2019 22:15	9/3/2019 13:15	894,062	20.54	119,439	145.84
Base			10	0.073	9/3/2019 13:15	9/11/2019 4:15	3,654,320	83.94	2,281	16.65
Storm			2,140	2.613	9/11/2019 4:15	9/11/2019 11:15	133,499	3.07	17,834	21.78
Base			10	0.073	9/11/2019 11:15	9/12/2019 4:15	331,885	7.62	207	1.51
Storm Composite	9/12/2019 8:00	9/12/2019 12:49	2,860	1.370	9/12/2019 4:15	9/12/2019 22:15	578,022	20.10	156,225	74.84
Base			10	0.073	9/12/2019 22:15	9/23/2019 13:15	5,427,060	124.65	3,388	24.73
Base Grab	9/23/2019 13:47	9/23/2019 13:47	4	0.046	9/23/2019 13:15	9/24/2019 13:15	397,122	9.13	99	1.14
Base			10	0.073	9/24/2019 13:15	9/29/2019 5:15	760,198	17.46	475	3.46
Storm			2,140	2.613	9/29/2019 5:15	9/29/2019 12:15	41,381	0.95	5,528	6.75
Base			10	0.073	9/29/2019 12:15	10/1/2019 14:15	307,973	7.07	193	1.40
Storm			2,140	2.613	10/1/2019 14:15	10/1/2019 23:15	164,945	3.79	22,035	26.91
Base			10	0.073	10/1/2019 23:15	10/3/2019 14:15	281,060	6.46	175	1.28
Storm			2,140	2.613	10/3/2019 14:15	10/3/2019 22:15	156,408	3.59	20,895	25.51
Base			10	0.073	10/3/2019 22:15	10/4/2019 15:15	823,432	18.91	514	3.75
Storm			2,140	2.613	10/4/2019 15:15	10/4/2019 22:15	170,282	3.91	22,748	27.78
Base			10	0.073	10/4/2019 22:15	10/5/2019 5:15	170,106	3.91	106	0.78
Storm			2,140	2.613	10/5/2019 5:15	10/5/2019 20:15	676,710	15.54	90,403	110.38
Base			10	0.073	10/5/2019 20:15	10/15/2019 8:15	72,564	1.67	9,694	11.84
Storm			2,140	2.613	10/15/2019 8:15	10/21/2019 7:15	1,498,810	34.43	936	6.83
Base			10	0.073	10/21/2019 7:15	10/22/2019 1:15	1,794,660	41.22	239,752	292.74
Base			10	0.073	10/22/2019 1:15	10/22/2019 7:15	282,889	6.50	177	1.29
Storm			2,140	2.613	10/22/2019 7:15	10/22/2019 21:15	963,082	22.12	128,660	157.10
Base Grab	10/24/2019 8:50	10/24/2019 8:50	8	0.051	10/22/2019 21:15	10/25/2019 9:15	3,621,650	83.19	1,809	11.53
Base			10	0.073	10/25/2019 9:15	10/29/2019 10:15	2,612,840	60.01	1,631	11.91
Base*			10	0.073	10/29/2019 10:15	11/21/2019 3:00	3,431,925	78.83	2,142	15.64
Storm*			2,140	2.613	11/21/2019 3:00	11/21/2019 11:00	158,400	3.64	21,161	25.84
Base*			10	0.073	11/21/2019 11:00	12/28/2019 14:00	4,811,400	110.51	3,004	21.93
Storm*			2,140	2.613	12/28/2019 14:00	12/29/2019 8:00	874,800	20.09	116,866	142.70
Base*			10	0.073	12/29/2019 8:00	1/1/2020 0:00	1,152,000	26.46	719	5.25
Snowmelt Average			104	0.404						
Storm Average			2,140	2.613						
Base Average			10	0.073						
All Average			954	1.307						
<b>Total</b>							<b>112,468,888</b>	<b>2,583</b>	<b>2,707,186</b>	<b>3,598</b>
Brown's Creek Major Subwatershed Total Acres							3,855			
Total TSS/TP(lb/acre/yr)									702.25	0.933
Total TSS/TP (kg/ha/yr)									787.11	1.046

Italics indicate estimated concentrations based on average base and storm flow concentrations.

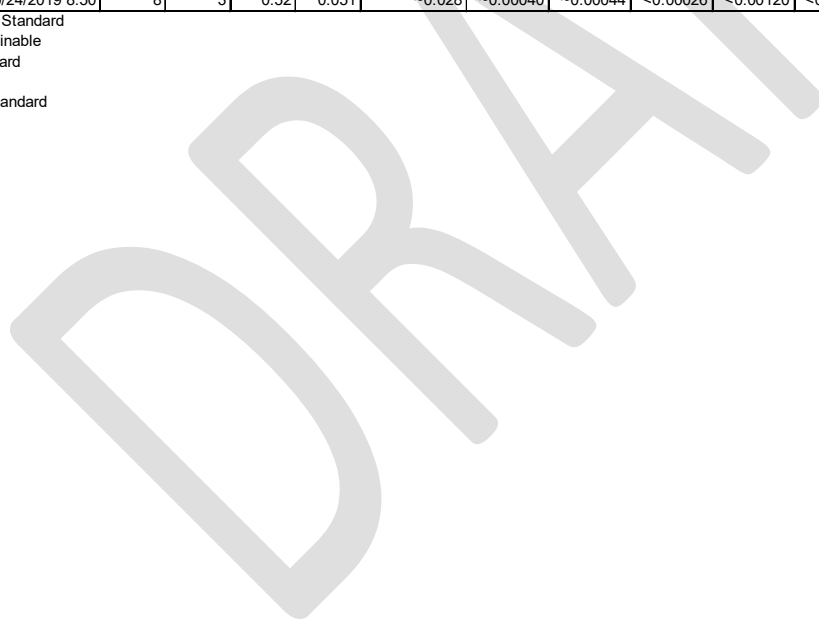
\*Interval volumes were estimated using similar flow conditions.

<sup>2</sup> TSS result excluded from averages.

**Table 4. Brown's Creek Diversion Structure Drainage 2019 Chemistry Results**

Sample Type	Start	End	TSS (mg/L)	VSS (mg/L)	TKN (mg/L)	TP (mg/L)	Dissolved P (mg/L)	Copper (mg/L)	Nickel (mg/L)	Lead (mg/L)	Zinc (mg/L)	Cadmium (mg/L)	Chromium (mg/L)	Chloride (mg/L)	Nitrite N (mg/L)	Nitrate N (mg/L)	Ammonia Nitrogen (mg/L)	Hardness (mg/L _CaCO3)
Snowmelt Grab	3/14/2019 11:20	3/14/2019 11:20	135	32	3.90	0.585	0.224							131.0	<0.03	0.62	0.90	
Snowmelt Grab	3/28/2019 9:05	3/28/2019 9:05	73	10	1.30	0.222	0.084	0.00320	0.00220	0.00130	0.00790	<0.000200	0.00210	76.3	<0.03	0.16	0.31	42
Storm Composite	5/8/2019 15:52	5/9/2019 8:32	2,900	725	18.00	3.280	0.068	0.02910	0.03340	0.02910	0.11400	0.001000	0.02950	64.2	<0.06	0.51	~0.03	94
Storm Composite	5/19/2019 6:03	5/19/2019 23:39	7,960	1,650	20.00	3.850	0.064	0.02970	0.03030	0.02770	0.10500	0.000950	0.02970	60.2	0.07	0.39	~0.05	174
Storm Composite	5/21/2019 22:47	5/22/2019 8:24	2,600	615	13.00	3.020	~0.046	0.02440	0.02640	0.02820	0.09300	0.000620	0.03000	82.4	0.12	<0.20	~0.04	67
Storm Composite	5/27/2019 14:36	5/28/2019 4:19	1,380	265	8.30	2.370	0.134	0.02320	0.02570	0.02470	0.08490	0.000610	0.02930	52.2	0.09	<0.20	~0.04	85
Storm Composite	7/1/2019 20:45	7/2/2019 7:58	1,510	344	8.40	2.890	0.072	0.01950	0.02270	0.01750	0.07610	0.000630	0.02040	46.7	<0.06	0.32	<0.02	86
Storm Composite	7/20/2019 9:49	7/20/2019 19:09	977	217	5.30	1.220	0.063							76.7	<0.06	<0.20	~0.03	
Storm Composite	8/13/2019 18:13	8/13/2019 22:37	2,750	725	13.00	2.900	0.075	0.02440	0.02830	0.02190	0.09530	0.000920	0.02600	2.80	0.07	0.34	<0.02	119
Storm Composite	9/12/2019 8:00	9/12/2019 12:49	2,860	548	5.70	1.370	0.089	0.00980	0.01060	0.00850	0.03600	~0.000230	0.01150	33.4	<0.06	0.30	<0.02	101
Base Grab	4/29/2019 13:55	4/29/2019 13:55	7	3	0.55	~0.044	<0.020	~0.00070	0.00058	~0.00050	<0.00120	<0.000063	0.00036	121.8	<0.06	0.27	~0.05	75
Base Grab	5/30/2019 14:02	5/30/2019 14:02	15	4	0.69	0.090	<0.020	~0.00080	0.00063	~0.00029	<0.00120	<0.000063	~0.00047	144.1	<0.06	<0.20	<0.02	38
Base Grab	6/25/2019 9:35	6/25/2019 9:35	16	6	0.59	0.130	~0.041	0.00110	0.00240	~0.00037	~0.00420	~0.000110	0.00072	86.3	<0.06	0.31	0.15	142
Base Grab	7/23/2019 14:53	7/23/2019 14:53	16	5	0.74	0.088	~0.039	~0.00057	0.00066	<0.00026	0.01180	<0.000063	~0.00042	131.1	<0.06	<0.20	~0.03	60
Base Grab	8/26/2019 13:31	8/26/2019 13:31	6	3	0.74	0.063	~0.034	~0.00040	~0.00044	<0.00026	<0.00120	<0.000063	~0.00027	95.1	<0.06	<0.20	~0.04	78
Base Grab	9/23/2019 13:47	9/23/2019 13:47	4	~2	0.54	~0.046	<0.020	<0.00034	0.00096	<0.00026	<0.00120	<0.000063	~0.00026	55.9	<0.06	0.57	~0.03	98
Base Grab	10/24/2019 8:50	10/24/2019 8:50	8	3	0.52	0.051	~0.028	~0.00040	~0.00044	<0.00026	<0.00120	<0.000063	~0.00023	47.8	<0.06	<0.02	<0.02	40

Exceeds Water Quality Standard  
 No Exceedance Determinable  
 Exceeds Chronic Standard  
 Exceeds Max Standard  
 Exceeds Final Acute Standard



## **STREAM AND STORMWATER MONITORING**

### **A. LILY LAKE INLET MONITORING**

In 2015 the MSCWMO received grant funding to conduct targeted water quality monitoring on Lily Lake with the goal of identifying priority areas for nutrient load reduction to the lake. The MSCWMO worked closely with the WCD to develop and implement a monitoring plan to achieve this goal.

In 2019, as in prior years, monitoring focused on the Greeley Street catchment recording; stage, velocity, and total discharge. Discharge was calculated using an area/velocity relationship from a sensor located at the inlet of the Greeley Street catchment. Total reported discharge was calculated using both logged data and estimations, which were made during periods when logged data was unavailable.

The recorded discharge to Lily Lake in 2019 was 8,557,064 cubic feet which was the highest recorded at the site. The volume was more than double what was recorded in 2018 even though the 2019 recorded date range had twenty-three fewer days. All discharge data from 2019 can be found in Table 5. Additionally, grab samples were collected and analyzed for the following water quality parameters: Total Phosphorus (TP), Total Kjeldahl Nitrogen (TKN), and Total Suspended Solids (TSS). Grab samples were divided into base and storm conditions based on logged stage and discharge data. Water quality results can be found in Table 6.

Sample results in 2019 were similar to results in prior years. The Greeley Street catchment base flow grab samples had low levels of TP and TSS. The 2019 average TP was 0.077 mg/L, which was slightly higher than the 2018 average (0.066 mg/L). The 2019 average TSS concentration was 2 mg/L, which was slightly less than the 4 mg/L seen in 2018 (Table 5 and Table 6). One storm event sample was collected in 2019, which followed previous years' observations with concentrations much higher than base samples. The TP concentration for the storm sample was 0.110 mg/L. This concentration was lower than the 2018 storm concentration of 0.316 mg/L, but much closer to the 2017 storm average (0.104 mg/L). The TSS storm concentration in 2019 was 8 mg/L which is lower than the 2018 storm concentration (518 mg/L) and the 2017 average

storm concentration (35 mg/L). Storm sample comparisons between 2019 and previous years are restricted because of the small sample size. The TP load to Lily Lake from Greeley Street was 41.1 lbs., higher than the load of 14.4 lbs. in 2018 (Table 5 and Figure 8). The TSS load was 978 lbs., higher than the 846 lbs. in 2018 (Table 5 and Figure 9).

Similar to previous years, storm sampling in 2019 was limited by the nature of the site as storm events at the Greeley Street Inlet are flashy. Storm events occur quickly as urban runoff is transported swiftly and this makes capturing a sample more difficult during these periods.

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**Table 5. Greeley Street 2019 Total Suspended Solids (TSS) and Total Phosphorus (TP) Loading**

Site	Date range	Total Estimated Flow (CF)	Total Estimated Flow (ac-ft)	Average Phosphorus Concentration (mg/L)	Phosphorus Range (mg/L)	Average TSS Concentration (mg/L)	TSS Range (mg/L)	TP Load (lbs.)	TSS Load (lbs.)
Greeley Street Base	5/15 - 10/28*^	8,557,064	196.55	0.077	0.046-0.134	2	1-3	41.1	978

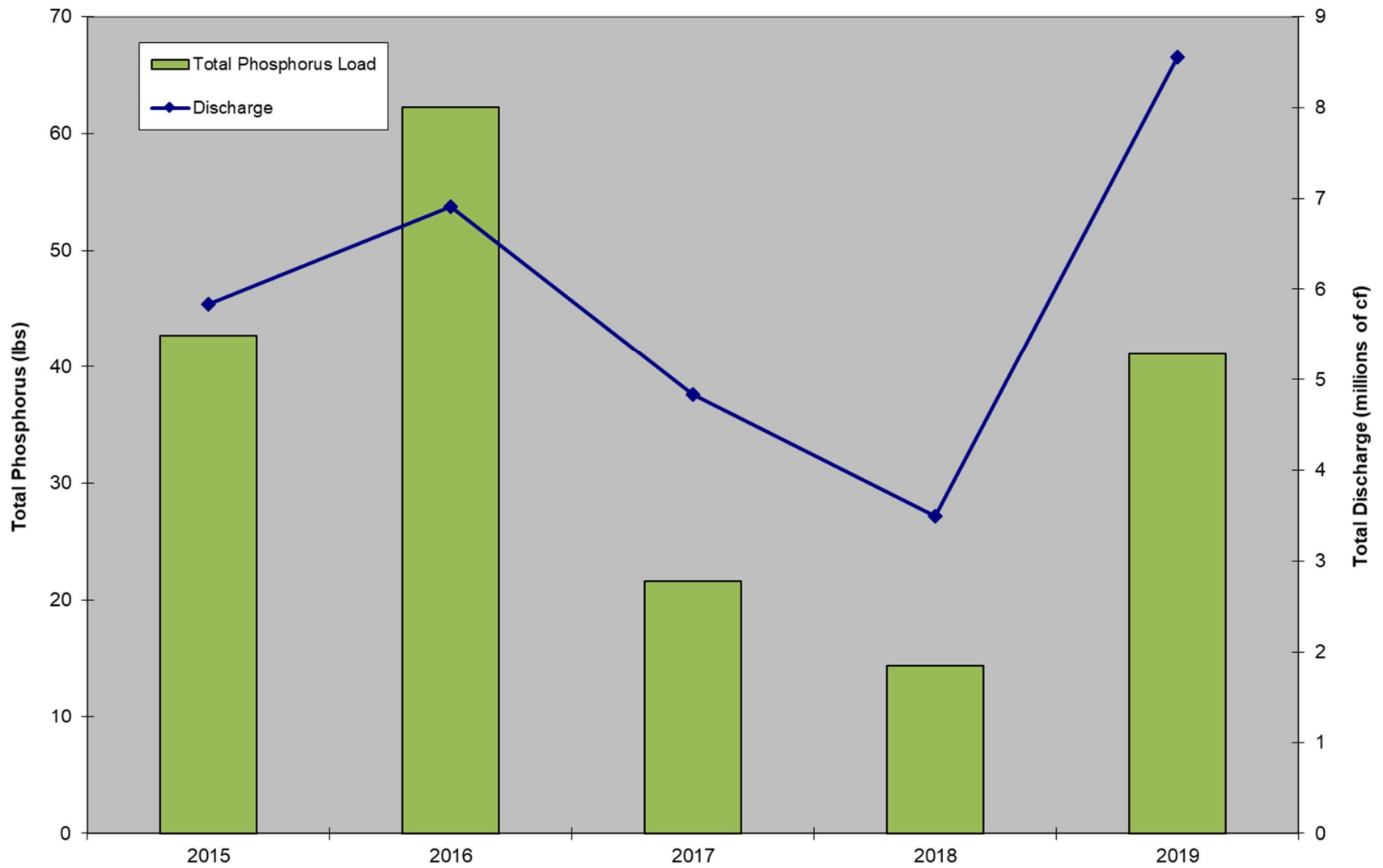
\*Indicates that estimations of flow occur during period using similar logged flow conditions  
 ^9/12 results excluded from averages and ranges

**Table 6. Greeley Street 2019 Water Quality Results**

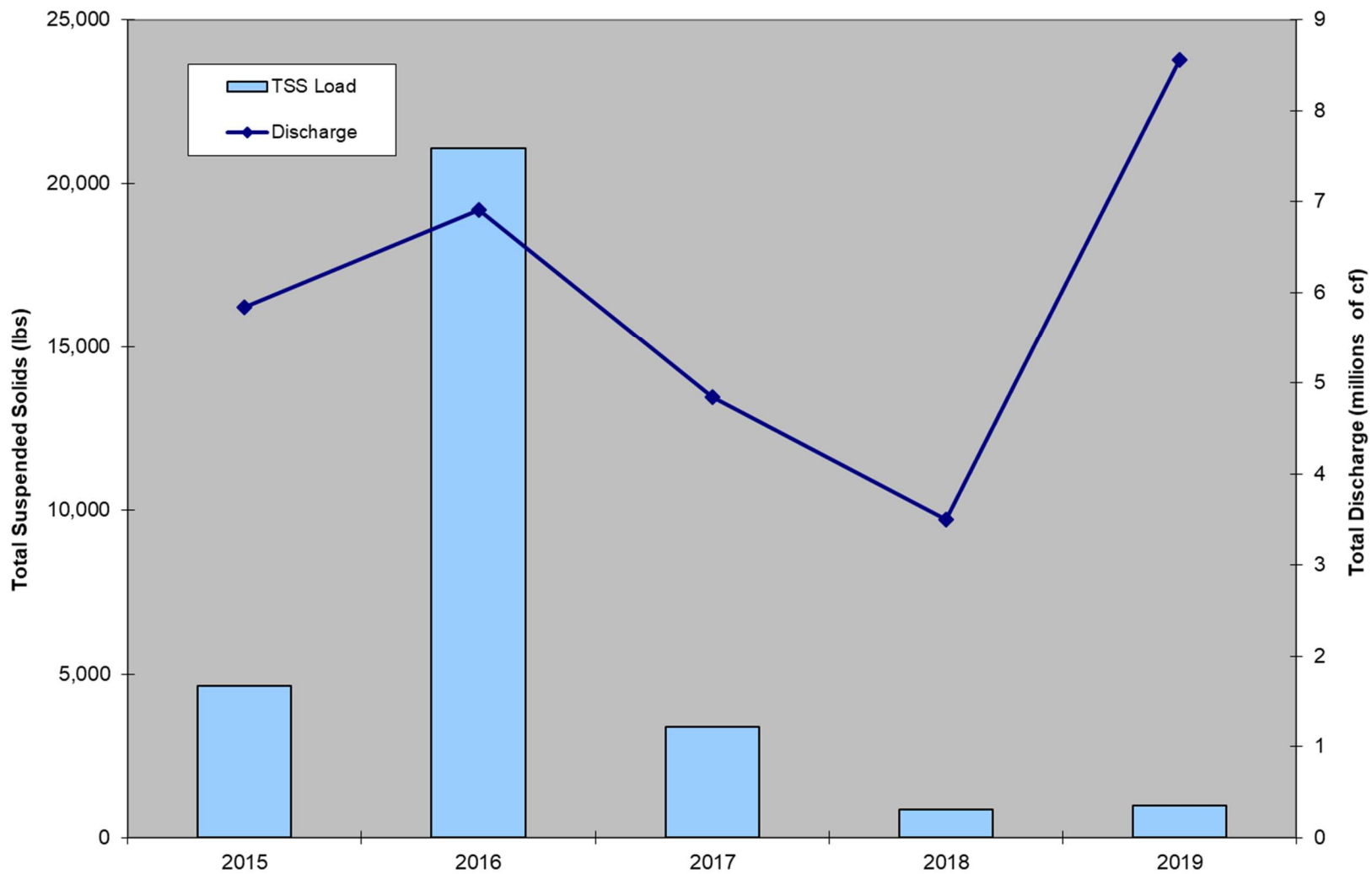
Date	Greeley Street			
	Sample Type	TP (mg/L)	TSS (mg/L)	TKN (mg/L)
5/30/2019	Base	0.079	~1	0.5
6/24/2019	Base	0.134	~2	0.97
7/25/2019	Base	0.095	~1	0.73
8/28/2019	Base	0.058	3	0.57
9/12/2019*	Storm	0.110	8	0.42
9/23/2019	Base	~0.046	~2	0.5
10/23/2019	Base	0.050	~2	0.41

\*Result excluded from averages





**Figure 8. Greeley Street Annual Discharge and Total Phosphorus Load**



**Figure 9. Greeley Street Annual Discharge and Total Suspended Solids Load**

## B. PERRO CREEK MONITORING

The goal of monitoring Perro Creek in 2016-2017 was to identify where the greatest contribution of nutrients and sediment to the Saint Croix River was occurring. Monitoring continued in 2018 and 2019 to further refine previous observations. In 2019, as in 2018, base and storm grab samples were collected at the Perro Creek at the Diversion Structure site, and analyzed for Total Phosphorus (TP), Total Kjeldahl Nitrogen (TKN), Total Suspended Solids (TSS) and *E. coli*. Samples were collected and analyzed for *E. coli* at Perro Creek at the Perro Pond Outlet, Perro Creek at 5th Avenue, Perro Creek at 9<sup>th</sup> Street, Perro Creek at 8<sup>th</sup> Street, Perro Creek at 6<sup>th</sup> Street, Perro Creek at 4<sup>th</sup> Street, Perro Creek at St. Croix Trail Downstream, Perro Creek at Central Avenue, and Perro Creek at 3<sup>rd</sup> Avenue.

In 2019 Perro Creek at the Diversion Structure had higher average results than 2018. The average phosphorus concentration was 0.180 mg/L with a range of 0.021-0.597 mg/L, higher than the average phosphorus concentration in 2018 of 0.065 mg/L and range of 0.020-0.252 mg/L. The average TSS concentration was 25 mg/L, which was higher than the 9 mg/L in 2018. Perro Creek at the Diversion Structure TSS results had a range of 1-97 mg/L, which was a higher range than 1-31 mg/L in 2018 (Table 7 and Table 8).

*E. coli* results are calculated by estimating the most probable number of *E. coli* organisms in a stream. The primary source of *E. coli* is human and animal waste. *E. coli* can cause diarrhea and abdominal cramps and is considered life-threatening for vulnerable populations such as children, and the elderly, making high *E. coli* presence a concern for human health. *E. coli* results were high for all sites during the storm event on 9/12/2019, with eight of the ten sites at or exceeding the standard testing limit of 2,420 most probable number of organisms (MPN) per 100/ml (Table 9). According to the MPCA standards, Perro Creek is exceeding impairment standards at 6<sup>th</sup> Street in June and September (Table 10). Impairment standards are based on MPCA protocol which includes the last ten years of data and requires at least 5 samples in a calendar month to calculate the geometric mean (average). More details on how the MPCA assesses *E. coli* can be found in the footnote below Table 10.

In 2019 additional sampling occurred on Perro Creek to determine if human fecal DNA was present in the *E.coli*. Samples were collected at four locations along the creek (Perro at 9<sup>th</sup> Street, Perro at 6<sup>th</sup> Street, Perro at the Diversion Structure, and Perro Creek at 3<sup>rd</sup> Ave) and were submitted to Source Molecular Corporation in Florida to be analyzed for the presence of human fecal gene biomarkers. Samples were collected on 8/1/2019, 8/28/2019, and 10/2/2019. Human fecal DNA was detected in the samples collected on 8/1/2019 and 10/2/2019 at the Perro Creek at 3<sup>rd</sup> Ave location. All other samples tested negative for human fecal DNA (Table 11). Samples will continue to be collected in 2020 for human fecal DNA analysis at the same four locations.

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**Table 7. Perro Creek 2019 Total Suspended Solids (TSS) and Total Phosphorus (TP)**

Site	Estimated Discharge (CFS)	Estimated Flow (ac-ft)	Proportion of Total Flow	Average Phosphorus Concentration (mg/L)	Phosphorus Range (mg/L)	Average TSS Concentration (mg/L)	TSS Range (mg/L)	TP Load (lbs.)	TSS Load (lbs.)
Perro at Diversion Structure Overflow 5/6/10/23	7,181,443	164.95	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Perro at Diversion Structure Base 5/6-10/23*	26,416,703	606.76	0.9823	0.034	0.021-0.065	2	1-3	56.069	3298
Perro at Diversion Structure Storm 5/6-10/23^	477,290	10.96	0.0177	0.372	0.133-0.597	58	21-97	11.084	1728

\* Excluded TP & TSS results from 6/24 base sample

^ Included TP & TSS results from 3/14 snowmelt sample

**Table 8. Perro Creek 2019 Water Quality Results**

Date	Perro Creek at the Diversion Structure			
	Sample Type	TP (mg/L)	TSS (mg/L)	TKN (mg/L)
3/14/2019	Snowmelt	0.504	63	3.40
5/8/2019	Storm	0.597	97	2.40
5/28/2019	Base	~0.025	~2	0.33
6/24/2019	Base	0.147	8	0.93
6/27/2019	Storm	0.252	51	2.00
7/30/2019	Base	0.065	3	0.33
8/27/2019	Base	~0.034	3	0.37
9/12/2019	Storm	0.133	21	0.35
9/26/2019	Base	~0.024	~1	0.26
10/23/2019	Base	~0.021	3	0.25

**Table 9. Perro Creek 2019 *E. coli* Results**

Site	<i>E. coli</i> Results				
	5/29/2019	6/24/2019	7/30/2019	8/27/2019	9/12/2019
Perro at Perro Pond Outlet	12	52	24	55	687
Perro at 5th Ave	19	50	59	68	1733
Perro at 9th Street	17	82	88	97	2420
Perro at 8th Street	12	88	50	104	>2420
Perro at 6th Street	28	365	93	82	>2420
Perro at 4th Street	46	197	129	152	>2420
Perro at St. Croix Trail Downstream	35	260	73	186	>2420
Perro at Diversion Structure	37	225	86	135	>2420
Perro at Central Ave	67	291	108	172	>2420
Perro at 3rd Ave	50	461	89	276	>2420

**Table 10. Monthly Geometric Means of *E. Coli* Latest Ten Years**

Monthly Geometric Means for *E. coli* (#/100 mL)

Site	April	May	June	July	August	September	October
Perro at Perro Pond Outlet	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data
Perro at 5th Ave	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data
Perro at 9th Street	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data
Perro at 8th Street	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data
Perro at 6th Street	Insufficient Data	58	196	116	100	415	Insufficient Data
Perro at 4th Street	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data
Perro at St. Croix Trail Downstream	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data
Perro at Diversion Structure	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data
Perro at Central Ave	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data
Perro at 3rd Ave	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data
	Exceeds geometric mean of 126 #/100mL from not less than 5 samples in a calendar month						
	10% of samples taken in the last 10 years exceed 1,260 #/100mL (Doesn't necessarily exceed geometric mean standard)						

\*Based on MPCA protocol: “Not to exceed 126 organisms per 100 milliliters as a geometric mean of not less than five samples representative of conditions within any calendar month, nor shall more than ten percent of all samples taken during any calendar month individually exceed 1,260 organisms per 100 milliliters. The standard applies only between April 1 and October 31.”

**Table 11. Perro Creek 2019 Human Fecal DNA Detection Results**

<b>Site</b>	<b>Date</b>	<b>DNA Analytical Results</b>
Perro Creek @ 9th Street	8/1/2019	Not Detected
Perro Creek @ 6th Street	8/1/2019	Not Detected
Perro Creek @ Diversion Structure	8/1/2019	Not Detected
Perro Creek @ 3rd Ave	8/1/2019	Detected
Perro Creek @ 9th Street	8/28/2019	Not Detected
Perro Creek @ 6th Street	8/28/2019	Not Detected
Perro Creek @ Diversion Structure	8/28/2019	Not Detected
Perro Creek @ 3rd Ave	8/28/2019	Not Detected
Perro Creek @ 9th Street	10/2/2019	Not Detected
Perro Creek @ 6th Street	10/2/2019	Not Detected
Perro Creek @ Diversion Structure	10/2/2019	Not Detected
Perro Creek @ 3rd Ave	10/2/2019	Detected

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## MSCWMO: CONCLUSIONS AND RECOMMENDATIONS

### A. LAKES

Lake monitoring in MSCWMO continues to provide valuable baseline water quality information. To determine the health of the lakes in MSCWMO, physical and chemical parameters are compared on a year-to-year basis and to other lakes in the region. Water quality in a lake depends on a number of different variables such as: size of the contributing watershed, external nutrient sources, depth of the lake, and the current amount of nutrients available to be periodically released from the lake bottom. Low water quality ratings of MSCWMO lakes are most likely due to long-term contribution of urban runoff (Lily Lake) or due to the sensitivity of shallow lakes being prone to summertime mixing (McKusick Lake). Shallow lakes typically exist in a low algal production, clear-water state with abundant aquatic macrophytes or in a high-algal production, turbid water state. Shallow lakes may not completely stratify in the summer, and therefore have the capability to continually mix throughout the summer. That mixing causes phosphorus to be distributed throughout the water column, causing more frequent and heavy algal blooms. This is unlike deeper, stratified lakes where phosphorus below the thermocline is not available for primary production.

The MPCA listed both Lily and McKusick Lake on the 303(d) Impaired Waters list for nutrient/eutrophication impairment; however McKusick Lake was delisted in 2012. If a water body is listed, it indicates that it does not currently meet water quality criteria. In order to meet those criteria, a total maximum daily load (TMDL) must be implemented. A TMDL outlines what pollutants are degrading the water quality and what will need to be done in order to meet current water quality standards. The MPCA had tentatively scheduled a three lake TMDL for Long Lake (Brown's Creek Watershed District), Lily Lake, and McKusick Lake in 2010, but because of improving water quality trends in those lakes over recent years the TMDL has been postponed. The MSCWMO, BCWD, and the City of Stillwater will utilize the City of Stillwater's existing Lake Management Plan, the completed Lily and McKusick Lake subwatershed assessments, and Lily Lake inlet monitoring data to further guide project implementation in an effort to continue to improve the water quality of the lakes. The MPCA will consider the need for a TMDL again in the future.



Summertime (June-September) TP, chlorophyll- $\alpha$ , and Secchi disk transparency averages have remained relatively consistent over the last twenty years in Lily Lake with the exceptions of 1995, 2001, 2009, 2013, and 2014 where overall water quality dramatically improved (Figure 4, Figure 5, and Figure 7). In 2001 phosphorus and chl- $\alpha$  levels dropped and the lake grade improved significantly. In 2006-2008, summer average TP, chl- $\alpha$ , and Secchi disk transparency deteriorated when compared to the averages seen from 2001 to 2005. In 2019 Lily Lake received a grade of a B-, close to the long-term average lake grade of a C+.

The cause of these one-year increases (1995, 2001, 2009, 2013, and 2014) in water quality is presently unknown, and there may be several possible explanations which could be investigated further in the future. Lily Lake has received herbicide and algaecide treatments from 1995-2011 and 2016-2018. In 2018 and 2019 the City of Stillwater and the Lily Lake Association did not request any large scale herbicide and algaecide treatments, departing from past years, under the directive of the MSCWMO Board. Individual landowner treatment did still occur in 2018-2019. Native buffer planting at the public access was installed in 2010. The Lily Lake watershed underwent a subwatershed assessment in 2010. As a result, fifteen raingardens were constructed in the Lily Lake watershed from 2011-2012, six large raingardens were installed in 2014, a gully stabilization project installed at Lakeview Hospital discharging to Brick Pond in 2017, and a large gully stabilization and stormwater treatment system discharging to Brick Pond in 2018. In 2019 another raingarden was installed. The effects of these BMPs may have been seen from 2012 to 2019 monitoring seasons with the 2016-2019 seasons having a statistically significant ( $p < 0.05$ ) improving trend for total phosphorus. Continued monitoring is needed to show changes to long term trends due to the implementation of these BMPs. In 2019 the Lily Lake Phosphorus Reductions for Delisting grant was secured. More information about the Lily Lake Impaired Waters Delisting Road Map can be found at <http://www.mscwmo.org/subwatershed-assessments>.

A subwatershed assessment was conducted on the McKusick Lake watershed in 2010. In 2011 six raingardens were constructed as a result of the subwatershed assessment. With renewed funding, seven additional raingardens were to be installed in the McKusick Lake watershed in 2013 but because of issues with utilities, six larger raingardens were installed in 2014. The impacts of previously installed raingardens may have been seen in 2017-2019 with statistically

significant ( $p < 0.05$ ) improving trends for average TP and average Secchi disk transparency. For more information on the McKusick Lake subwatershed assessment refer to the McKusick Lake Stormwater Retrofit Assessment found at <http://www.mscwmo.org/subwatershed-assessments>.

## **B. TARGETED MONITORING**

The targeted monitoring of Lily Lake had the goal of more accurately identifying the major sources of nutrients to the lake and to help steer targeting and design of stormwater management practices. Based on 2016 results, 78% of phosphorus loading to Lily Lake occurs during storm events. The highest contributing catchments during these events are Greeley Street and Lake Street, which combined account for 55% of the load. The remaining 22% of the phosphorus load was from base flow periods, with very low phosphorus concentration, from Brick Pond to Lily Lake, as indicated by the monitoring station at Greeley Street. However, base flow from Brick Pond accounted for 65% of the total discharge to the lake. While further reducing the phosphorus concentration discharging from Brick Pond is possible, it is not recommended due to the comparatively small reduction in phosphorus load to Lily Lake.

The phosphorus load from the Greeley Street catchment appears to be discharge driven, with a majority of flow coming from direct street runoff and not through Brick Pond. This was again observed in 2019 with low base flow discharge, low average TP concentrations (0.077 mg/L), and low average TSS concentrations (2 mg/L). The only storm event sample collected had a TP result of 0.110 mg/L and TSS result of 8 mg/L. These results confirm the previous investigation in regards to the Greeley Street catchment having low sample results for TP and TSS during base flow and higher results during storm events. However, more storm samples should be collected to calculate more accurate TP and TSS loadings and to better characterize storm events.

It's recommended that steps be taken to implement best management practices in the areas of the Greeley Street catchment that are directly discharging to Lily Lake, with less of an emphasis being placed on water entering Brick Pond. Continued monitoring at the Greeley Street catchment will help monitor the impact of BMPs installed in the Greeley Street catchment.

## C. STREAMS

Monitoring of Perro Creek started in 2016 to determine where the greatest contribution of nutrients and sediment to the St. Croix River was occurring. This investigation continued in 2019 through monitoring at Perro Creek at the Diversion Structure. The average total phosphorus result was 0.180 mg/L, higher than the 0.065 mg/L in 2018.

As in 2018, Perro Creek *E. coli* results are low at both sites prior to the creek entering the City of Bayport and results do not increase at all sites moving downstream as expected. The *E. coli* results didn't always significantly increase after the Perro Creek at 8<sup>th</sup> Street Site as was seen in 2018. However, there is a drop in *E. coli* results near the Perro Creek at the Diversion Structure site as seen in 2018. This may indicate that a source of groundwater, or piped drinking water, could be contributing to Perro Creek upstream of this area and diluting *E. coli*. Human fecal DNA was detected on 8/1/2019 and 10/2/2019 at the Perro Creek at 3<sup>rd</sup> Ave location, which is the furthest downstream sampling location. All other samples tested negative for human fecal DNA. Samples will continue to be collected in 2020 for human fecal DNA analysis at the same four locations to expand upon the 2019 dataset.

**APPENDIX A**  
**WATER QUALITY DATA – LILY LAKE AND MCKUSICK LAKE**

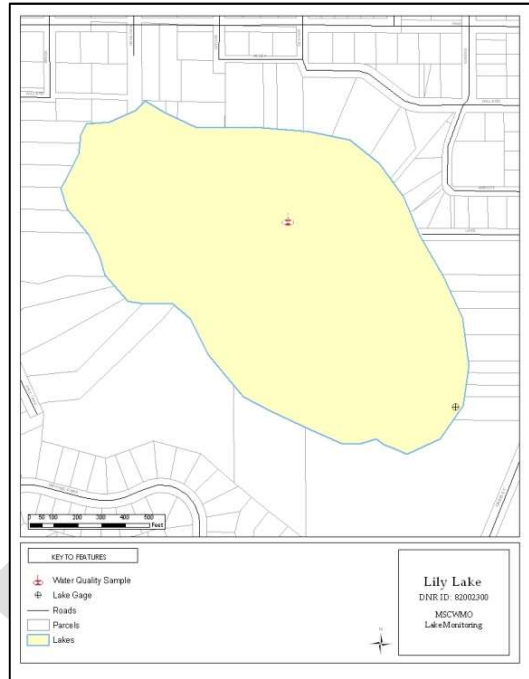
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# LILY LAKE

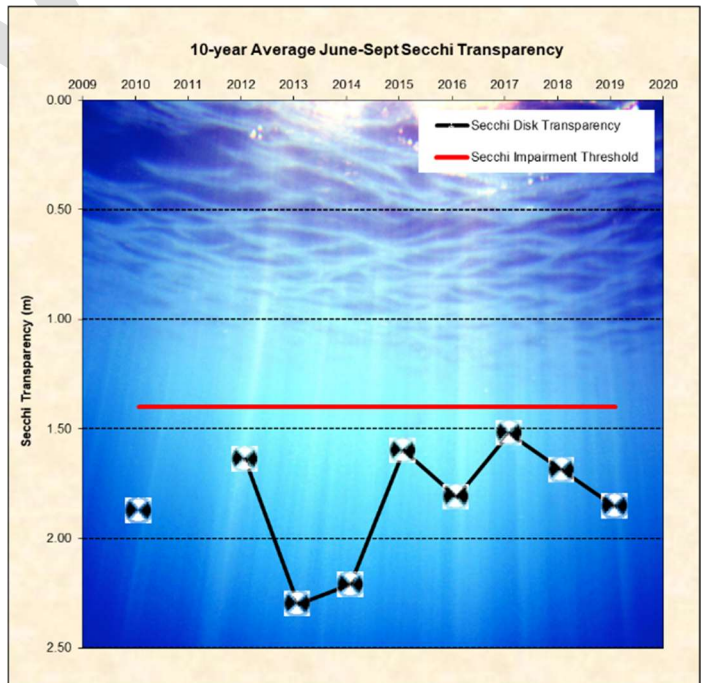
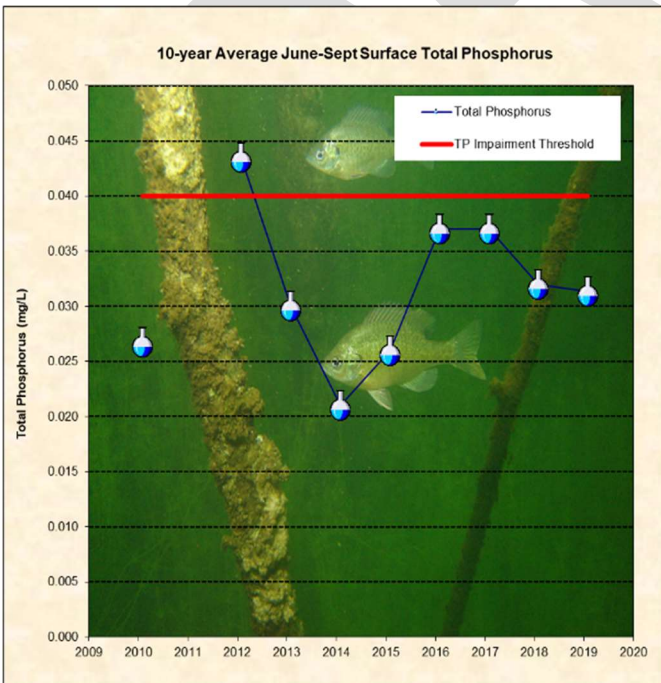
## 2019 Lake Grade: B-

- DNR ID #: 820023
- Municipality: City of Stillwater
- Location: NE ¼ Section 32, T30N-R20W
- Lake Size: 35.90 Acres
- Maximum Depth (2019): 50.0 ft
- Ordinary High Water Mark: 844.8 ft
- 55% Littoral
- Note: Littoral area is the portion of the lake <15 ft and dominated by aquatic vegetation.
- Publically accessible



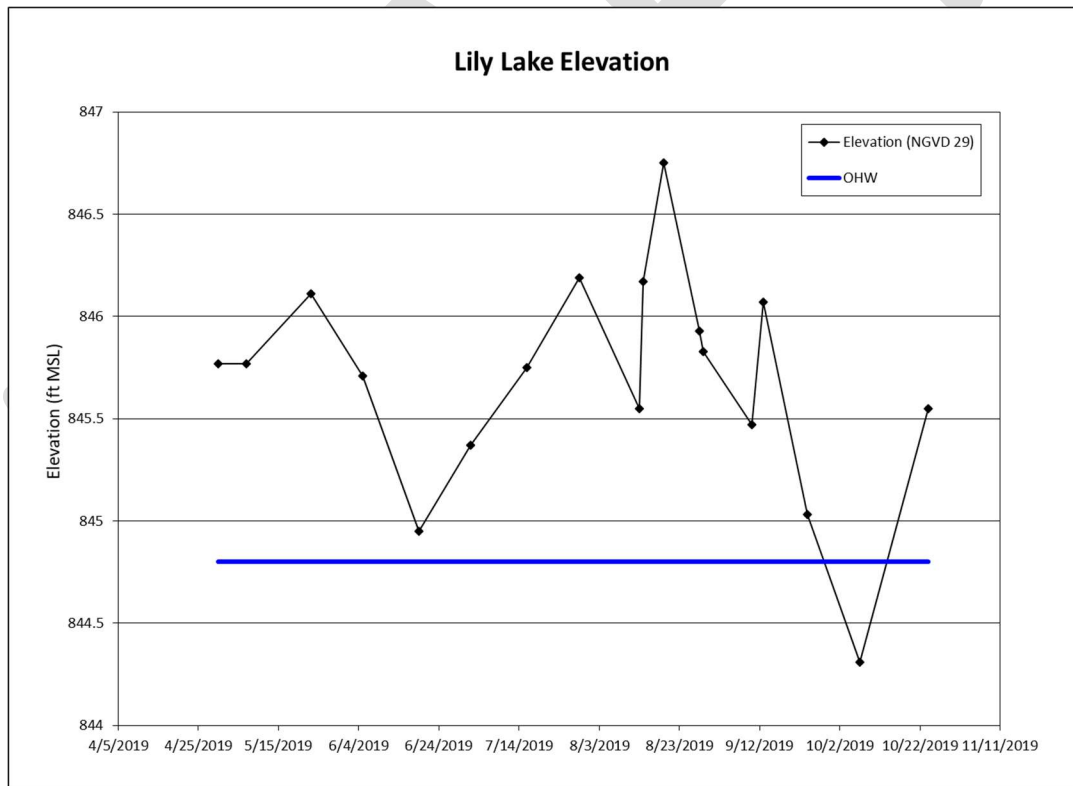
### Summary Points

- Based on the chlorophyll- $\alpha$  results Lily Lake was considered eutrophic in 2019, according to the Carlson Trophic State Index.
- Using a Kendall's Tau correlation test ( $p < 0.05$ ) there is a statistically significant **improving** trend for average total phosphorus, a statistically significant **declining** trend for average chlorophyll- $\alpha$ , and no trend is present for average Secchi transparency.
- The major land use is urban/residential.
- The lake stratified in 2019 with the thermocline between 4-5 meters deep.
- Lily Lake is listed as impaired for nutrients on the Minnesota Pollution Control Agency's Impaired Waters List.



Date/Time	Total Phosphorus (mg/L)	Uncorrected Trichromatic Chlorophyll-a (ug/L)	Pheophytin-Corrected Chlorophyll-a (ug/L)	Total Kjeldahl Nitrogen (mg/L)	Secchi Disk Depth (m)	Surface Temperature (Celsius)	Surface Dissolved Oxygen (mg/L)
4/23/2019 8:07	0.041	28.0	25.0	0.82	1.37	10.4	9.49
5/7/2019 8:21	0.024	3.1	3.0	0.62	3.66	13.9	10.47
5/23/2019 12:30	0.024	2.6	1.8	0.66	3.35	14.2	8.69
6/5/2019 9:36	0.020	3.1	3.0	0.53	4.04	21.6	8.97
6/19/2019 9:20	0.034	7.1	6.4	0.68	3.51	22.2	8.06
7/2/2019 9:08	0.032	22.0	21.0	0.91	1.52	24.6	9.49
7/16/2019 11:37	0.038	14.0	12.0	0.91	1.98	28.4	6.49
7/29/2019 13:08	0.033	36.0	33.0	1.10	1.07	26.2	7.82
8/13/2019 12:07	0.039	45.0	44.0	1.20	0.76	26.0	6.57
8/28/2019 8:20	0.036	39.0	40.0	1.20	0.76	21.1	6.56
9/10/2019 12:49	0.025	21.0	21.0	0.87	1.37	20.8	6.60
9/24/2019 13:33	0.025	14.0	13.0	0.80	1.68	21.4	8.13
10/7/2019 13:18	0.020	9.1	7.7	0.74	3.05	14.3	7.59
<b>2019 Average</b>	0.030	18.8	17.8	0.85	2.16	20.4	8.07
<b>2019 Summer Average</b>	0.031	22.4	21.5	0.91	1.85	23.6	7.63
Water quality thresholds are 0.04 mg/L TP, 14 µg/L CL-a, 1.4 m Secchi depth*							
Shallow lake water quality thresholds are 0.06 mg/L TP, 20 µg/L CL-a, 1.0 m Secchi depth*							
2019 Elevation (ft)	High	High Date	Low	Low Date	Average		
	846.75	8/19/2019	844.31	10/7/2019	845.68		

\*Data requirements and determinations of use assessment according to the MPCA's Guidance Manual for Assessing the Quality of Minnesota Surface Waters: "Samples must be collected over a minimum of 2 years and data used for assessments must be collected from June to September. Typically, a minimum of 8 individual data points for TP, corrected chlorophyll-a (chl-a corrected for pheophytin), and Secchi are required. Data used for phosphorus and chlorophyll-a calculations are limited to those collected from the upper most 3 meters of the water column (surface). If more than one sample is collected in a lake per day, these values are averaged to yield a daily average value. Following this step, all June to September data for the 10-year assessment window are averaged to determine summer-mean values for TP, corrected chl-a, and Secchi depth. These values are then compared to the standards and the assessment is made."



Lake Water Quality Summary										
	Summertime Lake Grades (May-Sept)									
	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
Total Phosphorus (mg/L)	B	B	C	C	B	A	B	C	NA	B
Chlorophyll-a (ug/L)	B	B	B	C	C	B	B	B	NA	C
Secchi depth (ft)	C	C	C	B	C	B	B	C	NA	C
<b>Overall</b>	<b>B-</b>	<b>B-</b>	<b>C+</b>	<b>C+</b>	<b>C+</b>	<b>B+</b>	<b>B</b>	<b>C+</b>	<b>NA</b>	<b>C+</b>

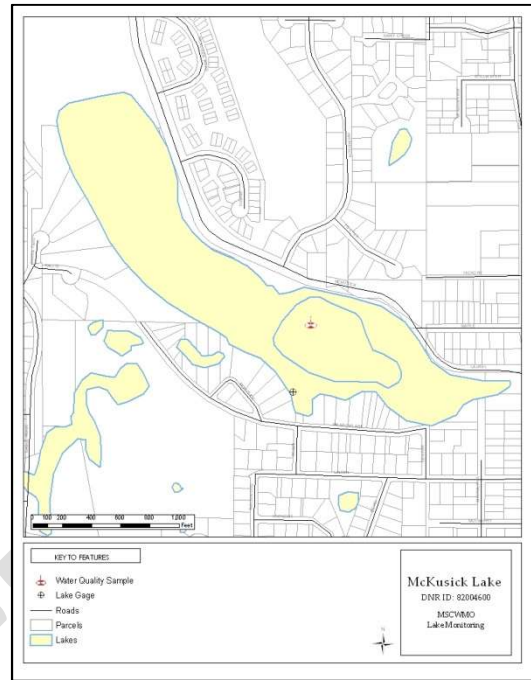
# MCKUSICK LAKE

2019 Lake Grade: B-

DNR ID #: 820020

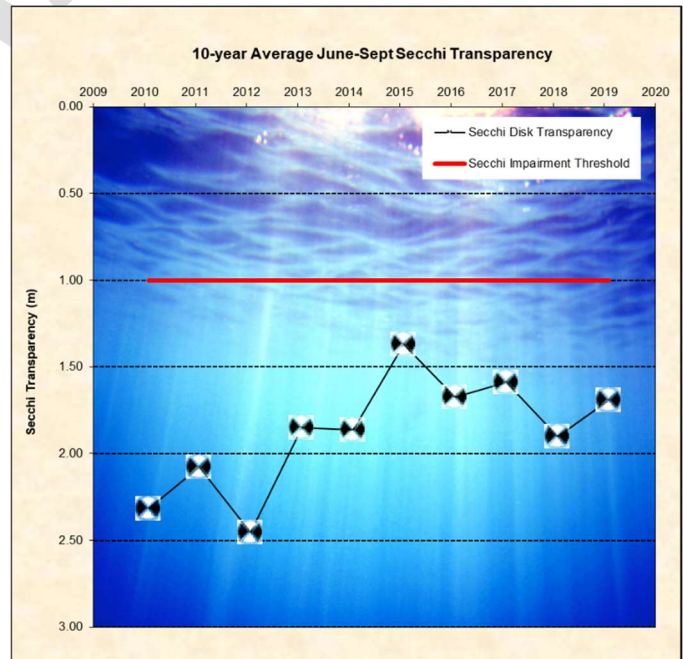
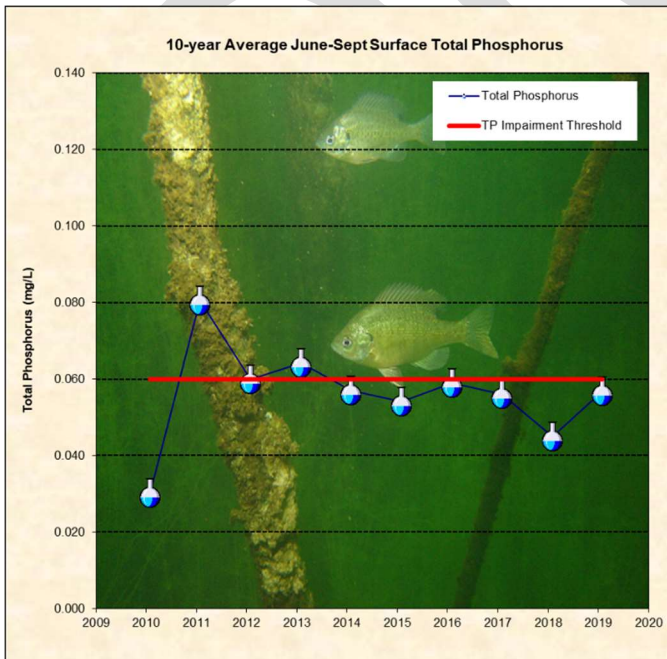
- Municipality: City of Stillwater
- Location: NE ¼ Section 29, T30N-R20W
- Lake Size: 46 Acres
- Maximum Depth (2019): 16 ft
- Ordinary High Water Mark: 851.7 ft
- 100% Littoral

Note: Littoral area is the portion of the lake <15 ft and dominated by aquatic vegetation.



## Summary Points

- Based on the chlorophyll- $\alpha$  results McKusick Lake was considered eutrophic in 2019, according to the Carlson Trophic State Index.
- Using a Kendall's Tau correlation test ( $p < 0.05$ ) there is a statistically significant **improving** trend for average Secchi transparency and average total phosphorus, and no trend for average chlorophyll- $\alpha$ .
- The major land use is urban/residential.
- The deepest portion of the lake stratified in 2019 with the thermocline around 3 meters deep.
- McKusick Lake was delisted in 2012 for its impairment for nutrients on the Minnesota Pollution Control Agency's Impaired Waters List.





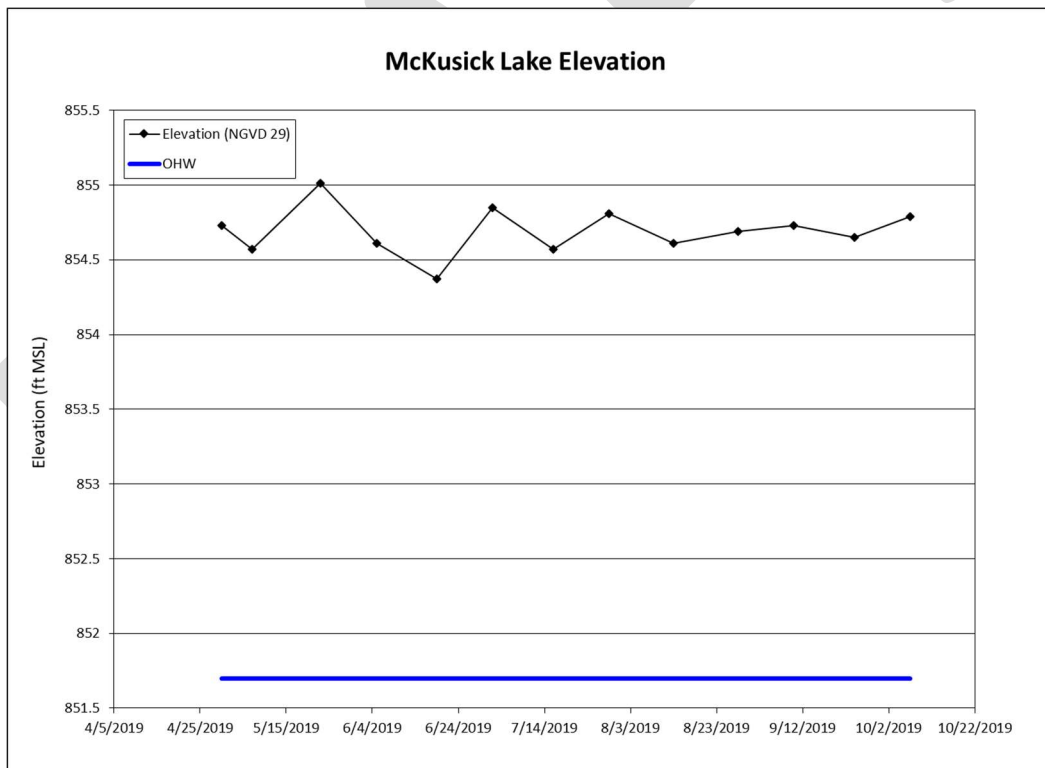
Date/Time	Total Phosphorus (mg/L)	Uncorrected Trichromatic Chlorophyll-a (ug/L)	Pheophytin-Corrected Chlorophyll-a (ug/L)	Total Kjeldahl Nitrogen (mg/L)	Secchi Disk Depth (m)	Surface Temperature (Celsius)	Surface Dissolved Oxygen (mg/L)
4/23/2019 8:53	0.062	30.0	28.0	0.82	1.22	10.7	9.49
5/7/2019 8:46	0.039	6.3	5.0	0.61	1.52	14.3	9.95
5/23/2019 12:02	0.043	5.6	5.1	0.62	2.29	13.9	8.78
6/5/2019 9:08	0.039	3.6	2.8	0.53	2.59	22.2	8.91
6/19/2019 9:52	0.055	3.3	2.9	0.64	2.74	22.2	9.26
7/2/2019 9:37	0.068	20.0	18.0	0.87	2.13	23.8	8.58
7/16/2019 11:09	0.058	11.0	9.0	0.84	1.37	26.7	3.45
7/29/2019 13:40	0.040	7.3	6.4	0.76	1.52	24.8	4.43
8/13/2019 11:35	0.069	4.2	3.7	0.71	1.37	23.5	2.64
8/28/2019 8:48	0.058	8.0	7.0	0.70	0.91	19.3	2.90
9/10/2019 11:44	0.053	17.0	15.0	0.68	1.37	18.5	4.11
9/24/2019 14:07	0.072	18.0	17.0	0.70	1.22	22.3	6.80
10/7/2019 12:47	0.047	4.1	3.4	0.57	2.29	13.2	6.76
<b>2019 Average</b>	0.054	10.6	9.5	0.70	1.74	19.6	6.62
<b>2019 Summer Average</b>	0.057	10.3	9.1	0.71	1.69	22.6	5.68

Water quality thresholds are 0.04 mg/L TP, 14 µg/L CL-a, 1.4 m Secchi depth\*

Shallow lake water quality thresholds are 0.06 mg/L TP, 20 µg/L CL-a, 1.0 m Secchi depth\*

	High	High Date	Low	Low Date	Average
<b>2019 Elevation (ft)</b>	855.01	5/23/2019	854.37	6/19/2019	854.69

\*Data requirements and determinations of use assessment according to the MPCA's Guidance Manual for Assessing the Quality of Minnesota Surface Waters: "Samples must be collected over a minimum of 2 years and data used for assessments must be collected from June to September. Typically, a minimum of 8 individual data points for TP, corrected chlorophyll-a (chl-a corrected for pheophytin), and Secchi are required. Data used for phosphorus and chlorophyll-a calculations are limited to those collected from the upper most 3 meters of the water column (surface). If more than one sample is collected in a lake per day, these values are averaged to yield a daily average value. Following this step, all June to September data for the 10-year assessment window are averaged to determine summer-mean values for TP, corrected chl-a, and Secchi depth. These values are then compared to the standards and the assessment is made."



Lake Water Quality Summary										
	Summertime Lake Grades (May-Sept)									
	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
Total Phosphorus (mg/L)	C	C	C	C	C	C	C	C	D	B
Chlorophyll-a (ug/L)	A	B	B	B	C	C	B	A	C	A
Secchi depth (ft)	C	C	C	C	C	C	C	B	C	B
<b>Overall</b>	<b>B-</b>	<b>C+</b>	<b>C+</b>	<b>C+</b>	<b>C</b>	<b>C</b>	<b>C+</b>	<b>B</b>	<b>C-</b>	<b>B+</b>

**FISCAL YEAR 2020 CLEAN WATER FUND COMPETITIVE GRANT PROGRAM  
PROJECT AGREEMENT (CWF C20-6055)  
Middle St Croix WMO – Lily Lake Alum Treatment**

This Fiscal Year 2020 Clean Water Fund Competitive Grant Program Project Agreement (“**AGREEMENT**”) is made as of this \_\_\_\_ day of \_\_\_\_\_, 2020 by and between the Middle Saint Croix Watershed Management Organization, a special purpose unit of local government (“**WMO**”), and the Board of Water and Soil Resources, a Minnesota municipal corporation (“**BWSR**”). The WMO and the BWSR may hereinafter be referred to individually as a “party” or collectively as the “parties.”

**RECITALS**

- A. The internal nutrient loading of phosphorus in the lakes within the WMO’S watershed is a serious concern and is within the scope of what the WMO may address as part of its 2015-2025 MSCWMO Watershed Management Plan;
- B. The WMO conducted a feasibility study dated June 14, 2018 called “Lily Lake Internal Load Study” and attached hereto as Exhibit A (“**Feasibility Study**”);
- C. The WMO sought Fiscal Year (FY) 2020 Clean Water Fund (CWF) Competitive Projects and Practices grant funds from BWSR to complete an aluminum sulfate treatment on Lily Lake as described in the WMO’s “Lily Lake Phosphorus Reductions for Delisting” FY2020 CWF Competitive Project and Practices grant application attached hereto as Exhibit B (collectively, the “**PROJECT**”);
- D. BWSR awarded the WMO FY 2020 CWF Competitive Projects and Practices grant funds in the amount of \$513,500 (“**GRANT**”) with a local match by the WMO, the City of Stillwater, and the Lily Lake Association in the amount of \$128,375, for completion of the PROJECT;
- E. The WMO will submit a GRANT work plan for the PROJECT and BWSR and the WMO will mutually enter into a GRANT agreement for the release, use, and reimbursement of GRANT funds by the WMO on eligible PROJECT expenditures for completion of the PROJECT in accordance with the BWSR approved GRANT work plan and GRANT agreement, attached hereto as Exhibit C.
- F. As a condition of release of the GRANT funds and reimbursement of eligible PROJECT expenditures, BWSR requires a statement of technical and project assurance that the PROJECT will be effective at reducing internal nutrient loading of phosphorous in Lily Lake by 120 pounds each year, for at least 10 years in accordance with the FY 2020 CWF Competitive Projects and Practices grant application and GRANT work plan; and
- G. The WMO agrees to carry out the PROJECT in accordance with the terms and conditions of the FY2020 CWF GRANT Agreement and this Agreement.

## AGREEMENT

In consideration of the mutual promises and covenants contained herein, the parties hereby agree as follows:

1. PROJECT. The WMO agrees to complete the PROJECT in accordance with the FY 2020 CWF Competitive Projects and Practices grant application “Lily Lake Phosphorus Reductions for Delisting”, attached hereto as Exhibit B, the GRANT work plan and GRANT Agreement for the PROJECT attached hereto as Exhibit C and the following:
  - (a) The WMO shall comply with all applicable contracting laws in hiring contractors to complete the PROJECT.
  - (b) The WMO shall be responsible for ensuring any required permits or permission required to complete the PROJECT are obtained.
  - (c) The WMO will enlist the services of a CONSULTANT to conduct the alum treatment and related tasks (e.g., Wenck Associates, Emmons & Olivier Resources, Washington Conservation District). The CONSULTANT will employ engineers, lake ecologists, limnologists, and soil geochemistry scientists, and water monitoring professionals experienced in developing lake aluminum sulfate dosing recommendations, and designing, inspecting, monitoring, and overseeing implementation of lake aluminum sulfate treatment projects. The CONSULTANT would also provide the technical project oversight and project certification.
  - (d) The WMO will complete the PROJECT and apply the aluminum sulfate treatment to specific treatment areas of Lily Lake in two doses, the first in 2020 and the second in 2022
  - (e) The WMO will conduct and collect, at a minimum, annual lake water quality monitoring data for Lily Lake, to track the effectiveness of the aluminum sulfate treatment in reducing the lake bottom sediment release of phosphorous and achieving the PROJECT water quality goal of reducing internal nutrient loading of phosphorous in Lily Lake by 120 pounds each year, for at least 10 years. The WMO shall make data, information, and progress updates available to BWSR upon request. The WMO shall include monitoring results in their regular annual report to BWSR.
  - (f) The feasibility study completed by the WMO identified that completion of the PROJECT would result in Lily Lake meeting State water quality standards (14 micrograms ( $\mu\text{g/L}$ ) chlorophyll-*a*, 1.4 meter secchi depth, and 40  $\mu\text{g/L}$  total phosphorous). If WMO lake water quality monitoring data collected for Lily Lake indicates that lake water quality does not meet the respective total phosphorous and either the chlorophyll-*a* or secchi depth State standards, for three out of any five years for the effective 10 year life of the PROJECT, the WMO agrees to undertake additional actions at the WMO’s expense to reduce internal and external phosphorous load

reductions to achieve the PROJECT annual 120 pounds of phosphorous load reduction and to meet State surface water quality standards for Lily Lake.

2. Audit. All WMO books, records, documents, and accounting procedures related to the PROJECT are subject to examination by BWSR.
3. Data Practices. The WMO shall retain and make available data related to the letting of contracts and the conducting of the PROJECT in accordance with the Minnesota Government Data Practices Act.
4. Term. This AGREEMENT shall be in effect as of the date first written above and shall terminate upon the end of the 10 year effective life of the PROJECT. The beginning date for the PROJECT effective life is the same date the WMO's technical provider certifies the PROJECT and the PROJECT is considered complete. The end date for the PROEJCT effective life shall be 10 years from the beginning date. Subsequent monitoring, testing and other actions as contemplated herein shall be completed as described during the term of this AGREEMENT.
5. Entire Agreement. This AGREEMENT, including the recitals and the exhibits which are incorporated in and made part hereof, constitutes the entire understanding between the parties regarding the PROJECT. No modifications to this AGREEMENT shall be valid unless reduced to writing and signed by both parties.

IN WITNESS WHEREOF, the parties have caused this Agreement to be executed by their duly authorized officers on behalf of the parties as of the day and date first above written.

**MIDDLE SAINT CROIX  
WATERSHED MANAGEMENT ORGANIZATION**

By: \_\_\_\_\_  
Its Chair

And by: \_\_\_\_\_  
Its Secretary

Date: \_\_\_\_\_

**BOARD OF WATER AND SOIL RESOURCES**

By: \_\_\_\_\_

Its: \_\_\_\_\_

Date: \_\_\_\_\_

**EXHIBIT A**  
Lily Lake Alum Treatment Feasibility Study

(attached hereto)

**EXHIBIT B**

Fiscal Year 2020 Clean Water Fund Competitive Project and Practices grant application “Lily Lake Alum Treatment”

(attached hereto)

**EXHIBIT C**  
Fiscal Year 2020 Clean Water Fund Competitive Project and Practices “Lily Lake Alum  
Treatment” Grant Agreement

(attached hereto)



# MIDDLE ST. CROIX WATERSHED MANAGEMENT ORGANIZATION

455 Hayward Avenue N. Oakdale, MN 55128  
Phone 651.330.8220 x22 fax 651.330.7747 www.mscwmo.org



## MEMORANDUM

**TO:** Middle St. Croix WMO Board of Managers  
**FROM:** Lauren Haydon, WCD Senior BMP Technician  
**DATE:** May 4<sup>th</sup>, 2020

### RE: 7c.) MOU –Washington County Cooperative Weed Management Area (WC-CWMA)

Invasive species have significant environmental, social, and economic impacts on natural areas, parks, and open spaces. Second only to habitat destruction, invasive species are a leading threat to the decline of native species in the United States. They negatively impact ecosystems through the displacement of native species and alteration of ecosystem functions such as soil stabilization, water infiltration and wildlife habitat. Washington County contains a diversity of conservation groups including governmental agencies, non-profit organizations, private business, and private citizens and landowners that give the county the unique opportunity to manage invasive plants in a cooperative manner.

In response to this need for cooperative management, the WC-CWMA began meeting in 2008 and has been meeting annually since 2016. At these meetings, partners provide updates, share invasive species management information, and define management and outreach needs for the coming year. CWMA grants have been used to provide cost share to manage eradicate species such as Grecian foxglove and Oriental bittersweet, but also garlic mustard, and Japanese knotweed.

The goal of the CWMA is to formalize its partnership with an MOU, provide better communication and prioritization with a steering committee, and position itself for future invasive species funding opportunities. By formally joining the WC-CWMA, MSCWMO would strengthen Washington county's ability to effectively manage invasive species and would benefit from the shared resources provided by this important partnership.

#### **Requested Board Action:**

Motion by Board Member 1, seconded by Board Member 2, to approve signing of the Memorandum of Understanding among Washington County Cooperative Weed Management Area partners.

# Memorandum of Understanding

## Among the Washington County Cooperative Weed Management Area Partners (Listed in Appendix A)

### **I. Background and Objectives**

Invasive species have significant environmental, social, and economic impacts on natural areas, parks, and open spaces. Invasive species are a leading threat to the native species of the United States, second only to habitat destruction. Invasive plants consume approximately three million acres of land each year. Invasive plants threaten both entire ecosystems and individual species. They negatively impact ecosystems through competition, suppression, and displacement of native species and can alter ecosystem functions. Washington County contains a myriad of groups including governmental agencies, non-profit organizations, private business, and private citizens and landowners that give the county the unique opportunity to manage invasive plants in a cooperative manner.

### **II. Purpose**

The purpose of this Memorandum of Understanding (MOU) is to encourage and formalize the cooperative relationship necessary for effective management, coordination, and implementation of invasive terrestrial and aquatic plant species programs among the above mentioned Partners.

Other organizations or individuals may, at any time, join as Partners of the Washington County Cooperative Weed Management Area (WC-CWMA). Partners may agree to offer funding or in-kind service to the WC-CWMA. These Partners will be required to sign a signatory page stating that they will voluntarily participate under the applicable guidelines in this MOU. Partners are listed in Appendix A.

## **Definition of terms**

*Introduction-* the intentional or unintentional escape, release, dissemination, or placement of a species into an ecosystem as a result of human activity.

*Ecosystem-* the complex of a community of organisms and its environment.

*Native species-* a plant species that historically occurred in Washington County, not as a result of an introduction.

*Local Ecotype Native Seed-* seed originating from the ecoregions found in Washington County. Seed used in the WC-CWMA must be Local Ecotype Native Seed, and must originate from as close to the given project as possible. "Yellow tag" certified seed should be used whenever possible.

*Non-native species-*with respect to a particular ecosystem, any plant species, including its seeds, spores, or other biological material capable of propagating that species, that has been introduced to that ecosystem by means other than natural processes.

*Invasive plant or weed-* a plant species, typically non-native, that has competitive advantages and can become established in natural plant communities and wild areas and replace native vegetation. They may alter the ecosystem and may cause economic, environmental, and/or social harm and may also negatively affect human health.

*Noxious weed-* a plant determined to be problem by a governmental agency. This can be on a county, state, or national level. They are mandated by law as pest species, and the law calls on all citizens for the destruction of the species.

*WC-CWMA - Washington County Cooperative Weed Management Area-* geographically defined as the lands and waters within the geopolitical boundaries of Washington County. A cooperative effort to manage invasive plants in Washington County.

*WC-CWMA Steering Committee - WC-CWMA Steering Committee* organizes members, provides direction, holds regular meetings, and generally furthers the common goal of cooperative invasive plant management. Each Partner will be directly or indirectly represented on the Steering Committee. The steering committee shall select a chair and vice chair.

### III. Legislative Authority

For the National Park Service, the legal authority for entering into this agreement is the National Park Service Organic Act (16 U.S.C. §§ 1-3). This is a general management authority for entering into a memorandum of understanding to document mutually agreed upon policies, procedures, objectives, and/or assistance relationships that do not involve funding.

This MOU is neither a fiscal nor a funds obligation document. Any action involving contribution of funds or reimbursement between parties to this MOU will be handled in accordance to applicable laws, regulation, and procedures including those for Government procurement and printing. These actions will be outlined in separate agreements between parties and will be authorized by the appropriate statutory authority. This authority does not provide such authority, nor does it establish authority for noncompetitive award to the cooperator of any contract or other agreement. Any contract or agreement for training or other services must fully comply with all applicable requirements for competition.

### IV. Statement Of Work

The intent of this MOU is to enhance the success of the Cooperative Weed Management Area for Washington County by encouraging sharing of resources, information, expertise, and effort on a willing and cooperative basis on both public and private lands and waters. This MOU is not intended to establish legal authorities or mandates where they do not currently exist.

The undersigned parties mutually agree to the following:

- a. Participate and/or cooperate in the development of the Washington County Cooperative Weed Management Area (WC-CWMA); including cooperatively preparing a Management Plan to describe the goals objectives and strategies of the CWMA. The Management Plan will outline the structure and function of the CWMA and provide any other needed background information. Absent any separate agreement among one or more parties, each party is solely responsible for its own costs and participation in this joint planning effort.
- b. Share information among Partners and provide assistance and expertise regarding invasive plant management activities on their lands and waters.
- c. Provide opportunities to outside interest groups, private landowners, and the public for involvement in carrying out weed management planning and education on lands and waters within the Washington County Cooperative Weed Management Area (WC-CWMA).
- d. Utilize the Washington Soil and Water Conservation Division as the fiscal administrator for any grants or financial support received by the WC-CWMA.
- e. Review this MOU and make revisions and updates as necessary to meet the purpose of the agreement. Amendments shall become effective upon approval by all Partners.

This MOU in no way restricts any of the Partners from participating in similar activities with other public or private agencies, organizations, or individuals.

**V. Term of Agreement**

This MOU will become effective upon July 1<sup>st</sup>, 2020. Any additional parties added after this date will be subject to the 30 day review process outlined in Section VII before becoming a partner. This MOU expires 5 years from the effective date at which time it will be subject to review, renewal, or expiration. If the Partners mutually agree to continue cooperation, a new agreement shall be executed.

**VI. Modification and Termination**

Modifications to this MOU shall be made by the issuance of a unanimously approved modification prior to any changes being performed. Any Partner may withdraw from this agreement at any time before the date of expiration by providing 30 days written notice to all signatories.

**VII. Additional Parties to the MOU**

Additional parties may, and are encouraged to, be added to the MOU as Partners at anytime. All Partners will be notified of any additional party and will be given 30 days after the notification to determine if there is a conflict of interest. If a conflict of interest is identified the Partner may choose to withdraw from the MOU. If the Partner does not withdraw, then the additional party with the conflict of interest may not be added to the MOU.

**VIII. Key Officials and Signatures**

A separate page will be included for each of the Partners designating the key official to this MOU and the signature for the person authorized to enter into this agreement.

**Memorandum of Understanding**

Among the  
Washington County Cooperative Weed Management Area Partners  
(Listed in Appendix A)

**IX. Key Official and Signatures (continued)**

**Name, Title:**

**Agency/Organization:**

**Address:**

**Key Official Signature:** \_\_\_\_\_

**X. Primary Partner Contact**

**Name, Title:**

**Agency/Organization (If different than above):**

**Phone:**

**E-mail:**

## Appendix A.

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MEMORANDUM

**TO:** Matt Downing, Administrator  
**FROM:** Rebecca Nestingen, PE  
**DATE:** May 6<sup>th</sup>, 2020

**RE: 9a) Plan Reviews/Submittals**

The following is a summary of recent activity on projects submittals which qualify for plan review under the MSCWMO 2015 Watershed Management Plan (WMP):

- **3<sup>rd</sup> and Myrtle Street Condominium Development.** A new condominium development is proposed in the currently vacant lot and the intersection of 3<sup>rd</sup> and Myrtle Street in Stillwater. A project application for review was received on February 27<sup>th</sup>, 2020. On March 5<sup>th</sup>, the MSCWMO staff sent a review letter requesting revision and resubmittal to address eleven items. Revised materials were received on March 20<sup>th</sup>, March 31<sup>st</sup>, and April 21<sup>st</sup>, 2020. *Staff recommends approval with three conditions.*
- **CenterPoint Energy Natural Gas – Quinlan Ave N.** CenterPoint Energy proposes to complete a gas line reconstruction along Quinlan Ave N in Lake St. Croix Beach to maintain the integrity of the existing natural gas system. A project application was received on April 16<sup>th</sup>, 2020. The project creates minimal disturbance yet qualifies for review with MSCWMO erosion and sediment control performance standards. *Staff recommends approval with four conditions.*
- **Central Automotive.** The construction of a new automotive repair shop is proposed at 59<sup>th</sup> St and Osgood Ave N in Oak Park Heights. A project application for review was received on April 14<sup>th</sup>, 2020. As submitted the project proposed stormwater management with an infiltration basin, however, the project is located within a high vulnerability drinking water source management and area and wellhead protection area with prohibited infiltration. *Staff recommends the applicant revise and resubmit.*



# MIDDLE ST. CROIX WATERSHED MANAGEMENT ORGANIZATION

455 HAYWARD AVENUE OAKDALE, MINNESOTA 55128  
Phone 651.330.8220 x22 fax 651.330.7747 www.mscwmo.org



April 29, 2020

Mr. Shawn Sanders  
City of Stillwater  
406 Fourth Street North  
Stillwater, MN 55082

RE: 3<sup>rd</sup> and Myrtle Condominium Development

Dear Mr. Sanders:

The Middle St. Croix Watershed Management Organization (MSCWMO) received revised submittal items on April 21<sup>st</sup>, 2020 for the proposed 3<sup>rd</sup> and Myrtle Condominium Development, located within MSCWMO boundaries and in the City of Stillwater. The proposed project qualifies for full review under the MSCWMO 2015 Watershed Management Plan (WMP).

The MSCWMO has reviewed the project and recommends approval with 3 conditions:

1. A Stormwater Pollution Prevention Plan (SWPPP) that meets the National Pollutant Discharge Elimination System (NPDES) requirements. (see specific plan and narrative requirements in checklist)
2. Dedications or easements for the portions of the property which are adjacent to the facility and which lie below the 100 year flood level. For sites within public right-of-way, no easement is required
3. A proposed maintenance agreement, which may be in the format of Appendix K, or other form approved by the city.

This recommended approval is based on the technical review of the MSCWMO performance standards and does not constitute approval by the City of Stillwater. MSCWMO review process information can be downloaded from [www.mscwmo.org](http://www.mscwmo.org). The project review checklist is attached. Please contact me at 651-330-8220 x22 or [m Downing@mnwcd.org](mailto:m Downing@mnwcd.org) if you have any questions regarding these comments.

Sincerely,

A handwritten signature in black ink, appearing to read "Matt Downing".

Matt Downing  
Interim Administrator  
Middle St. Croix Watershed Management Organization

# MIDDLE ST. CROIX WATERSHED MANAGEMENT ORGANIZATION

455 HAYWARD AVE. N.  
OAKDALE, MINNESOTA 55128  
Phone 651.330.8220 x22 fax 651.330.7747 www.mscwmo.org



## PROJECT REVIEW

**MSCWMO Project Review ID:** 20-002

**Project Name:** 3<sup>rd</sup> and Myrtle Condominium Development

**Applicant:** Jon Whitcomb representing Metro East Commercial Real Estate

**Purpose:** Construct a new building with underground parking

**Location:** 3<sup>rd</sup> and Myrtle Street, Stillwater, MN

**Review date:** 04/29/2020

**Recommendation:** Approval with 3 conditions:

1. A Stormwater Pollution Prevention Plan (SWPPP) that meets the National Pollutant Discharge Elimination System (NPDES) requirements.
2. Dedications or easements for the portions of the property which are adjacent to the facility and which lie below the 100 year flood level. For sites within public right-of-way, no easement is required
3. A proposed maintenance agreement, which may be in the format of Appendix K, or other form approved by the city.

### Applicability:

- Any project undertaking grading, filling, or other land alteration activities that involve movement of 100 cubic yards of earth or removal of vegetation on greater than 10,000 square feet of land
- Any project that creates or fully reconstructs 6,000 square feet or more of impervious surface
- All major subdivisions or minor subdivisions that are part of a common plan of development. Major subdivisions are defined as subdivisions with 4 or more lots.
- Any project with wetland impacts
- Any project with grading within public waters
- Any project with grading within buffers
- Any project with grading within 40-feet of the bluff line
- Development projects that impact 2 or more of the member communities
- New or redevelopment projects within the St. Croix Riverway that require a building permit that adds five hundred (500) square feet or more of additional impervious surface

- Any project requiring a variance from the current local impervious surface zoning requirements for the property
- Any land development activity, regardless of size, that the City determines is likely to cause an adverse impact to an environmentally sensitive area or other property, or may violate any other erosion and sediment control standard set by the member community.

**SUBMITTAL ITEMS:**

Electronic submittals are highly encouraged

- A completed and signed project review application form and review fee
- Grading Plan/Mapping Exhibits
  - a. Property lines and delineation of lands under ownership of the applicant.
  - b. Delineation of existing on-site wetlands, shoreland and/or floodplain areas (including any buffers).
  - c. Ordinary High Water (OHW) elevations and datum, as determined by the MDNR (if applicable).
  - d. Existing and proposed site contour elevations related to NAVD 1988 datum (preferred) or NGVD, 1929. Datum must be noted on exhibits.
  - e. Drainage easements covering land adjacent to ponding areas, wetlands, and waterways up to their 100-year flood levels and covering all ditches and storm sewers. Access easements to these drainage easements and to other stormwater management facilities shall also be shown.
  - f. Minimum building elevation for each lot.
  - g. Identification of downstream water body.
- Permanent Stormwater Management System in compliance with the requirements of the NPDES SDS Construction Stormwater Permit and MSCWMO Performance Standards.
  - a. Impervious areas (Pre- and Post-Construction).
  - b. Construction plans and specifications for all proposed stormwater management facilities.
  - c. Location(s) of past, current or future onsite well and septic systems (if applicable).
- NA Other exhibits required to show conformance to these Performance Standards
- A Stormwater Pollution Prevention Plan in compliance with the requirements of the NPDES SDS Construction Stormwater Permit**
- Grading Plan/Mapping Exhibits:
  - a. Delineation of the subwatersheds contributing runoff from off-site, proposed and existing on-site subwatersheds, and flow directions/patterns.
  - b. Location, alignment, and elevation of proposed and existing stormwater facilities.

**Middle St. Croix Watershed Management Organization**

MEMBER COMMUNITIES:

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- c. Existing and proposed normal water elevations and the critical (the highest) water level produced from the 100-year 24-hour storms.
- d. Location of the 100-year flood elevation, natural overflow elevation, and lowest floor elevations.

Hydrologic/Hydraulic Design Exhibits:

- a. All hydrologic and hydraulic computations completed to design the proposed stormwater management facilities shall be submitted. Model summaries must be submitted. The summaries shall include a map that corresponds to the drainage areas in the model and all other information used to develop the model.
- b. A table (or tables) must be submitted showing the following:
  - i. A listing of all points where runoff leaves the site and the existing and proposed stormwater runoff rates and volumes.
  - ii. A listing of the normal water levels under existing and proposed conditions and the water levels produced from the storm and runoff events listed above for all on-site wetlands, ponds, depressions, lakes, streams, and creeks.

Dedications or easements for the portions of the property which are adjacent to the facility and which lie below the 100 year flood level. For sites within public right-of-way, no easement is required.

A proposed maintenance agreement, which may be in the format of Appendix K, or other form approved by the city.

**HISTORY & CONSIDERATIONS:**

**SPECIAL OR IMPAIRED WATER**

- This site drains to, and is within one mile of special or impaired water and complies with enhanced protections.
  - a. Scenic or Recreational river C.1., C.2., C.3.
  - b. Scientific and Natural area C.1., C.2., C.3.
  - c. Waterbody with a TMDL C.1., C.2.
    - C.1. Stabilization initiated immediately and all soils protected in seven days/provide temp basin for five acres draining to common location.
    - C.2. Treat water quality volume of one inch of runoff by retaining on site unless not feasible due to site conditions (See Part III.D.1. design requirements).
    - C.3. Maintain buffer zone of 100 linear feet from Special Water.

**EROSION AND SEDIMENT CONTROL** *[A checked box indicates compliance]*

A Stormwater Pollution Prevention Plan (SWPPP) that meets the National Pollutant Discharge Elimination System (NPDES) requirements.

*Narrative*

**Middle St. Croix Watershed Management Organization**

MEMBER COMMUNITIES:

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- Identify the person knowledgeable and experienced who will oversee the implementation of the SWPPP; the installation, inspection, and maintenance of the BMPs.
  - a. Identifies the person who will oversee the BMP inspection and maintenance.
  - b. Identify the training requirements are satisfied.
  - c. Inspections performed once every 7 days.
  - d. Inspections performed within 24 hours of a rain event greater than 0.5 in/24 hours.
  - e. Inspection and Maintenance records include:
    - i. Date and time of inspection.
    - ii. Name of person(s) conducting inspections.
    - iii. Finding of inspections, including the specific location where corrective actions are needed.
    - iv. Corrective actions taken (including dates, times, and party completing maintenance activities).
    - v. Date and amount of rainfall events greater than 0.5 in/24 hours.
    - vi. Rainfall amounts must be obtained by a properly maintained rain gauge installed onsite, or by a weather station that is within one mile or by a weather reporting system.
    - vii. Requirements to observe, describe, and photograph any discharge that may be occurring during the inspection.
    - viii. All discovered nonfunctional BMPs must be repaired, replaced, or supplemented with functional BMPs within 24 hours after discovery, or as soon as field conditions allow.
- Describes procedures to amend the SWPPP and establish additional temporary ESC BMPs as necessary for site conditions.
- Describes the installation timing for all Erosion Sediment Control (ESC) Best Management Practices (BMPs).
- Describes final stabilization methods for all exposed areas.
- Methods used to minimize soil compaction and preserve topsoil must be described.
- NA Describes dewatering technique to prevent nuisance conditions, erosion, or inundation of wetlands?
- Identifies any specific chemicals and the chemical treatment systems that may be used for enhancing the sedimentation process on the site, and how compliance will be achieved with the permit requirements.
- Describes pollution prevention management measures
  - a. Storage, handling, and disposal of construction products, materials, and wastes.
  - b. Fueling and maintenance of equipment or vehicles; spill prevention and response.
  - c. Vehicle and equipment washing.
  - d. No engine degreasing allowed on site.
  - e. Containment of Concrete and other washout waste.
  - f. Portable toilets are positioned so that they are secure.

### **Middle St. Croix Watershed Management Organization**

MEMBER COMMUNITIES:

Afton, Bayport, Baytown Township, Lakeland, Lakeland Shores, Lake St. Croix Beach, Oak Park Heights, St. Mary's Point, Stillwater and West Lakeland Township

*Plan sheets*

NA Temporary Sediment Basins required (10 acres draining to common location or **5 acres App. A**)  
 Basin design meets the following criteria:

- a. Adequately sized – 2-year, 24-hour storm, minimum 1,800 feet/acre; or no calculative minimum 3,600ft<sup>3</sup>/acre.
- b. Designed to prevent short circuiting.
- c. Outlets designed to remove floating debris.
- d. Outlets designed to allow complete drawdown.
- e. Outlets designed to withdraw water from the surface
- f. Outlets have energy dissipation.
- g. Have a stabilized emergency spillway.
- h. Situated outside of surface waters and any natural buffers.
- Locations and types of all temporary and permanent Erosion Control BMPs.
  - a. Exposed soils have erosion protection/cover initiated immediately and finished within 7 days.
  - b. Wetted perimeters of ditches stabilized within 200 feet of surface water within 24 hours.
  - c. Pipe outlets have energy dissipation within 24 hours of connecting.
- Locations and types of all temporary and permanent Sediment Control BMPs.
  - a. Sediment control practices established on down gradient perimeters and upgradient of any buffer zones.
  - b. All inlets are protected.
  - c. Stockpiles have sediment control and placed in areas away from surface waters or natural buffers.
  - d. Construction site entrances minimize street tracking?
  - e. Plans minimize soil compaction and, unless infeasible to preserve topsoil.
  - f. 50 foot natural buffers preserved or (if not feasible) provide redundant sediment controls when a surface water is located within 50 feet of the project's earth disturbances and drains to the surface water.
- Tabulated quantities of all erosion prevention and sediment control BMPs.
- Stormwater flow directions and surface water divides for all pre- and post-construction drainage areas.
- NA Locations of areas not to be disturbed (buffer zones).

**Middle St. Croix Watershed Management Organization**

MEMBER COMMUNITIES:

Afton, Bayport, Baytown Township, Lakeland, Lakeland Shores, Lake St. Croix Beach, Oak Park Heights, St. Mary's Point, Stillwater and West Lakeland Township

NA Location of areas where construction will be phased to minimize duration of exposed soil areas.

NA Blufflines are protected from construction activities in urban (40 foot buffer) areas and rural areas (100-foot buffer).

### **LAKE, STREAM AND WETLAND BUFFERS**

NA A buffer zone of unmowed natural vegetation is maintained or created upslope of all water bodies (wetlands, streams, lakes).

NA A 50 foot natural buffer or (if a buffer is infeasible) provide redundant sediment controls when a surface water is located within 50 feet of the project's earth disturbances and stormwater flows to the surface water.

NA If adjacent to a Special or Impaired Water an undisturbed buffer zone of not less than 100 linear feet from the special water is maintained both during construction and as a permanent feature post construction.

### **STORMWATER MANAGEMENT** *[A checked box indicates compliance]*

Water quality treatment is provided prior to direct discharge of stormwater to wetlands and all other water bodies.

#### ***Rate and Flood Control Standards***

The peak rate of stormwater runoff from a newly developed or redeveloped site shall not exceed the 2-, 10-, and 100-year 24-hour storms with respective 2.8, 4.2, and 7.3-inch rainfall depths with MSCWMO approved time distribution based on Atlas 14 for existing and proposed conditions. The runoff curve number for existing agriculture areas shall be less than or equal to the developed condition curve number. The newly developed or redeveloped peak rate shall not exceed the existing peak rate of runoff for all critical duration events, up to and including the 100-year return frequency storm event for all points where discharges leave a site during all phases of development.

Predevelopment conditions assume "good hydrologic conditions" for appropriate land covers as identified in TR-55 or an equivalent methodology. Runoff curve numbers have been increased where predevelopment land cover is cropland:

Hydrologic Soil Group A: Runoff Curve Number 56

Hydrologic Soil Group B: Runoff Curve Number 70

Hydrologic Soil Group C: Runoff Curve Number 79

Hydrologic Soil Group D: Runoff Curve Number 83

Computer modeling analyses includes secondary overflows for events exceeding the storm sewer systems level-of-service up through the critical 100-year event.

NA In sub-areas of a landlocked watershed, the proposed project does not increase the predevelopment volume or rate of discharge from the sub-area for the 10-year return period event.

Flowage easements up to the 100-yr flood level have been secured for stormwater management facilities (such as ditches and storm sewers).

### **Middle St. Croix Watershed Management Organization**

#### **MEMBER COMMUNITIES:**

Afton, Bayport, Baytown Township, Lakeland, Lakeland Shores, Lake St. Croix Beach, Oak Park Heights, St. Mary's Point, Stillwater and West Lakeland Township

NA Lowest floor elevations of structures built adjacent to stormwater management features and other water bodies are a minimum of two feet above the 100-year flood elevation and a minimum of two feet above the natural overflow of landlocked basins.

**Volume Control Standards**

- Calculations/computer model results indicate stormwater volume is controlled for new development and redevelopment requirements per the MSCWMO Design Standards.
  1. New Nonlinear Development 1.1" \* new impervious surfaces
  2. Reconstruction/Redevelopment Projects 1.1" \* reconstructed impervious surfaces
  3. Linear Projects 0.55" \* new and/or fully reconstructed impervious surface and 1.1" from net increase in impervious area
  4. Sites with Restrictions- flexible treatment options documentation has been provided.

Volume Retention Required (cu. ft.)	Volume Retention Provided (cu. ft.)	
$9352 \text{ ft}^2 \times \frac{1.1 \text{ in}}{12 \text{ in/ft}} = 857 \text{ ft}^3$	<b>BMP</b>	<b>Volume</b>
	Underground	657 cu. ft.
	North Basin	76 cu. ft.
	West Basin	138 cu. ft.
	East Basin	34 cu. ft.
<b>Total Required 857 cu. ft.</b>	<b>Total Proposed</b>	<b>905 cu.ft.</b>

**Flexible Treatment Options (when applicable)**

- NA Applicant demonstrated qualifying restrictions as defined in Section 7.2.2 (4) of the 2015 MSCWMO Watershed Management Plan that prohibits the infiltration of the entire required volume.
- NA MIDS calculator submission removes 75% of the annual total phosphorous.

**Infiltration/Filtration Design Standards**

- Proposed stormwater management features meet or exceed NPDES General Construction Permit requirements are designed in conformance with the most recent edition of the State of Minnesota Stormwater Manual.
- None of the following conditions exist that prohibit infiltration of stormwater on the site
  - a. Areas where vehicle fueling and maintenance occur.
  - b. Areas with less than three (3) feet of separation distance from the bottom of the infiltration system to the elevation of the seasonally saturated soils or the top of bedrock.
  - c. Areas where industrial facilities are not authorized to infiltrate industrial stormwater under an National Pollutant Discharge Elimination System (NPDES)/State Disposal System (SDS) Industrial Stormwater Permit issued by the MPCA.
  - d. Areas where contaminants in soil or groundwater will be mobilized by infiltrating stormwater.

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- e. Areas of Hydrologic Soil Group D (clay) soils
- f. Areas within 1,000 feet up-gradient, or 100 feet down-gradient of active karst features unless allowed by a local unit of government with a current MS4 permit.

Minimum setbacks from the Minnesota Department of Health for infiltration practices are met

Setback	Minimum Distance (ft)
Property line	10
Building foundation*	10
Private well	35
Public water supply well	50
Septic system tank/leach field	35
*Minimum with slopes directed away from the building	

Pretreatment device(s) remove at least 50% of sediment loads. If downstream from a potential hot spot, a skimmer is in place to facilitate cleanup.

Water quality volume will be discharged through infiltration or filtration media in 48 hours or less.

- a. For bioretention (biofiltration and bioinfiltration) volume control management facilities above ground with vegetation the period of inundation shall be calculated using the maximum water depth below the surface discharge elevation and the soil infiltration rate.
- b. For infiltration basin volume control management facilities the period of inundation shall be calculated using the maximum water depth below the surface discharge elevation and the soil infiltration rate.

Appropriate soil borings have been conducted that meet the minimum standards.

- a. A minimum of one boring was conducted at the location of the infiltration facility for facilities up to 1,000 ft<sup>2</sup>; between 1,000 and 5,000 ft<sup>2</sup>, two borings, between 5,000 and 10,000 ft<sup>2</sup>, three borings and greater than 10,000 ft<sup>2</sup> 4 borings plus an additional boring for every 2,500 ft<sup>2</sup> beyond 12,500 ft<sup>2</sup>
- b. Soil borings extend a minimum of five feet below the bottom of the infiltration practice. If fractured bedrock is suspected, the soil boring goes to a depth of at least ten feet below the proposed bottom of the volume control facility.
- c. A minimum of three feet of separation to the seasonal water table and/or bedrock.
- d. Identify unified soil classification.

The least permeable soils horizon identified in the soil boring dictated the infiltration rate.

Additional flows are bypassed and are routed through stabilized discharge points.

NA Filtration basin demonstrates a basin draw down between 24 hours and 48 hours.

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# MIDDLE ST. CROIX WATERSHED MANAGEMENT ORGANIZATION

455 HAYWARD AVE. N, OAKDALE, MINNESOTA 55128  
Phone 651.330.8220 x22 fax 651.330.7747 www.mscwmo.org



April 30, 2020

Dave Engstrom  
City of Lake St. Croix Beach  
16455 20<sup>th</sup> Street South  
Lake St. Croix Beach, MN 55403

RE: CenterPoint Energy Natural Gas – Quinlan Ave

Dear Mr. Engstrom,

The Middle St. Croix Watershed Management Organization (MSCWMO) received required submittal items for the proposed CenterPoint Energy Natural Gas – Quinlan Ave project, located within MSCWMO boundaries and in the City of Lake St. Croix Beach. The proposed project qualifies for full review under the MSCWMO 2015 Watershed Management Plan (WMP).

The MSCWMO has reviewed the project and recommends approval with 4 conditions:

1. Identify BMP inspector training, inspection frequency, and record keeping requirements in the SWPPP
2. Describes the installation timing for all Erosion Sediment Control (ESC) Best Management Practices (BMPs) in the SWPPP.
3. Describes pollution prevention management measures in the SWPPP.
4. Provide types/estimated quantities of BMPs in site plan.

This recommended approval is based on the technical review of MSCWMO performance standards and does not constitute approval by the City of Lake St. Croix Beach. The enclosed checklist contains detailed information on project review qualification and the policies and performance standards of the WMP. MSCWMO review process information can be downloaded from [www.mscwmo.org](http://www.mscwmo.org). Please contact me at 651-330-8220 x22 or [m Downing@mnwcd.org](mailto:m Downing@mnwcd.org) if you have any questions regarding these comments.

Sincerely,

A handwritten signature in black ink, appearing to read "Matt Downing".

Matt Downing  
MSCWMO Administrator



# PROJECT REVIEW

**MSCWMO Project Review ID:** 20-005

**Project Name:** Quinlan Ave

**Applicant:** CenterPoint Energy Natural Gas Operations

**Purpose:** To maintain the integrity of the existing natural gas distribution system

**Location:** Quinlan Ave ROW, Lake St. Croix Beach

**Review date:** 04/30/20

**Recommendation:**

Approval with four conditions:

1. Identify BMP inspector training required, inspection frequency, and record keeping requirements in the SWPPP
2. Describes the installation timing for all Erosion Sediment Control (ESC) Best Management Practices (BMPs) in the SWPPP.
3. Describes pollution prevention management measures in the SWPPP.
4. Provide types/estimated quantities of BMPs in site plan.

**Applicability:**

- Any project undertaking grading, filling, or other land alteration activities that involve movement of 100 cubic yards of earth or removal of vegetation on greater than 10,000 square feet of land
- Any project that creates or fully reconstructs 6,000 square feet or more of impervious surface
- All major subdivisions or minor subdivisions that are part of a common plan of development. Major subdivisions are defined as subdivisions with 4 or more lots.
- Any project with wetland impacts
- Any project with grading within public waters
- Any project with grading within buffers
- Any project with grading within 40-feet of the bluff line
- Development projects that impact 2 or more of the member communities

- New or redevelopment projects within the St. Croix Riverway that require a building permit that adds five hundred (500) square feet or more of additional impervious surface
- Any project requiring a variance from the current local impervious surface zoning requirements for the property
- Any land development activity, regardless of size, that the City determines is likely to cause an adverse impact to an environmentally sensitive area or other property, or may violate any other erosion and sediment control standard set by the member community.

**SUBMITTAL ITEMS:**

Electronic submittals are highly encouraged

- A completed and signed project review application form and review fee
- Grading Plan/Mapping Exhibits
  - a. Property lines and delineation of lands under ownership of the applicant.
  - b. Delineation of existing on-site wetlands, shoreland and/or floodplain areas (including any buffers).
  - c. Ordinary High Water (OHW) elevations and datum, as determined by the MDNR (if applicable).
  - d. Existing and proposed site contour elevations related to NAVD 1988 datum (preferred) or NGVD, 1929. Datum must be noted on exhibits.
  - e. Drainage easements covering land adjacent to ponding areas, wetlands, and waterways up to their 100-year flood levels and covering all ditches and storm sewers. Access easements to these drainage easements and to other stormwater management facilities shall also be shown.
  - f. Minimum building elevation for each lot.
  - g. Identification of downstream water body.
- NA Permanent Stormwater Management System in compliance with the requirements of the NPDES SDS Construction Stormwater Permit and MSCWMO Performance Standards.
  - a. Impervious areas (Pre- and Post-Construction).
  - b. Construction plans and specifications for all proposed stormwater management facilities.
  - c. Location(s) of past, current or future onsite well and septic systems (if applicable).
- Other exhibits required to show conformance to these Performance Standards
- A Stormwater Pollution Prevention Plan in compliance with the requirements of the NPDES SDS Construction Stormwater Permit
- Grading Plan/Mapping Exhibits:
  - a. Delineation of the subwatersheds contributing runoff from off-site, proposed and existing on-site subwatersheds, and flow directions/patterns.

**Middle St. Croix Watershed Management Organization**

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- b. Location, alignment, and elevation of proposed and existing stormwater facilities.
- c. Existing and proposed normal water elevations and the critical (the highest) water level produced from the 100-year 24-hour storms.
- d. Location of the 100-year flood elevation, natural overflow elevation, and lowest floor elevations.

NA Hydrologic/Hydraulic Design Exhibits:

- a. All hydrologic and hydraulic computations completed to design the proposed stormwater management facilities shall be submitted. Model summaries must be submitted. The summaries shall include a map that corresponds to the drainage areas in the model and all other information used to develop the model.
- b. A table (or tables) must be submitted showing the following:
  - i. A listing of all points where runoff leaves the site and the existing and proposed stormwater runoff rates and volumes.
  - ii. A listing of the normal water levels under existing and proposed conditions and the water levels produced from the storm and runoff events listed above for all on-site wetlands, ponds, depressions, lakes, streams, and creeks.

NA Dedications or easements for the portions of the property which are adjacent to the facility and which lie below the 100 year flood level. For sites within public right-of-way, no easement is required.

NA A proposed maintenance agreement, which may be in the format of Appendix K, or other form approved by the city.

**HISTORY & CONSIDERATIONS:**

**SPECIAL OR IMPAIRED WATER**

- This site drains to, and is within one mile of special or impaired water and complies with enhanced protections.
  - a. Scenic or Recreational river C.1., C.2., C.3.
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  - c. Waterbody with a TMDL C.1., C.2.
    - C.1. Stabilization initiated immediately and all soils protected in seven days/provide temp basin for five acres draining to common location.
    - C.2. Treat water quality volume of one inch of runoff by retaining on site unless not feasible due to site conditions (See Part III.D.1. design requirements).
    - C.3. Maintain buffer zone of 100 linear feet from Special Water.

**EROSION AND SEDIMENT CONTROL** [*A checked box indicates compliance*]

A Stormwater Pollution Prevention Plan (SWPPP) that meets the National Pollutant Discharge Elimination System (NPDES) requirements.

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*Narrative*

- Identify the person knowledgeable and experienced who will oversee the implementation of the SWPPP; the installation, inspection, and maintenance of the BMPs.
- a. Identifies the person who will oversee the BMP inspection and maintenance.
  - b. Identify the training requirements are satisfied.
  - c. Inspections performed once every 7 days.
  - d. Inspections performed within 24 hours of a rain event greater than 0.5 in/24 hours.
  - e. Inspection and Maintenance records include:
    - i. Date and time of inspection.
    - ii. Name of person(s) conducting inspections.
    - iii. Finding of inspections, including the specific location where corrective actions are needed.
    - iv. Corrective actions taken (including dates, times, and party completing maintenance activities).
    - v. Date and amount of rainfall events greater than 0.5 in/24 hours.
    - vi. Rainfall amounts must be obtained by a properly maintained rain gauge installed onsite, or by a weather station that is within one mile or by a weather reporting system.
    - vii. Requirements to observe, describe, and photograph any discharge that may be occurring during the inspection.
    - viii. All discovered nonfunctional BMPs must be repaired, replaced, or supplemented with functional BMPs within 24 hours after discovery, or as soon as field conditions allow.
- Describes procedures to amend the SWPPP and establish additional temporary ESC BMPs as necessary for site conditions.
- Describes the installation timing for all Erosion Sediment Control (ESC) Best Management Practices (BMPs).
- Describes final stabilization methods for all exposed areas.
- Methods used to minimize soil compaction and preserve topsoil must be described.
- Describes dewatering technique to prevent nuisance conditions, erosion, or inundation of wetlands?
- NA Identifies any specific chemicals and the chemical treatment systems that may be used for enhancing the sedimentation process on the site, and how compliance will be achieved with the permit requirements.
- Describes pollution prevention management measures
- a. Storage, handling, and disposal of construction products, materials, and wastes.
  - b. Fueling and maintenance of equipment or vehicles; spill prevention and response.
  - c. Vehicle and equipment washing.
  - d. No engine degreasing allowed on site.
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**Middle St. Croix Watershed Management Organization**

## MEMBER COMMUNITIES:

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f. Portable toilets are positioned so that they are secure.

*Plan sheets*

NA Temporary Sediment Basins required (10 acres draining to common location or **5 acres App. A**)  
Basin design meets the following criteria:

- a. Adequately sized – 2-year, 24-hour storm, minimum 1,800 feet/acre; or no calculative minimum 3,600ft<sup>3</sup>/acre.
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- Tabulated quantities of all erosion prevention and sediment control BMPs.**
- Stormwater flow directions and surface water divides for all pre- and post-construction drainage areas.

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- Locations of areas not to be disturbed (buffer zones).
- Location of areas where construction will be phased to minimize duration of exposed soil areas.
- Blufflines are protected from construction activities in urban (40 foot buffer) areas and rural areas (100-foot buffer).*

#### **LAKE, STREAM AND WETLAND BUFFERS**

- NA A buffer zone of unmowed natural vegetation is maintained or created upslope of all water bodies (wetlands, streams, lakes).
- NA A 50 foot natural buffer or (if a buffer is infeasible) provide redundant sediment controls when a surface water is located within 50 feet of the project's earth disturbances and stormwater flows to the surface water.
- NA If adjacent to a Special or Impaired Water an undisturbed buffer zone of not less than 100 linear feet from the special water is maintained both during construction and as a permanent feature post construction.

#### **STORMWATER MANAGEMENT** *[A checked box indicates compliance]*

- NA Water quality treatment is provided prior to direct discharge of stormwater to wetlands and all other water bodies.

#### ***Rate and Flood Control Standards***

- NA The peak rate of stormwater runoff from a newly developed or redeveloped site shall not exceed the 2-, 10-, and 100-year 24-hour storms with respective 2.8, 4.2, and 7.3-inch rainfall depths with MSCWMO approved time distribution based on Atlas 14 for existing and proposed conditions. The runoff curve number for existing agriculture areas shall be less than or equal to the developed condition curve number. The newly developed or redeveloped peak rate shall not exceed the existing peak rate of runoff for all critical duration events, up to and including the 100-year return frequency storm event for all points where discharges leave a site during all phases of development.
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  - Hydrologic Soil Group B: Runoff Curve Number 70
  - Hydrologic Soil Group C: Runoff Curve Number 79
  - Hydrologic Soil Group D: Runoff Curve Number 83
- NA Computer modeling analyses includes secondary overflows for events exceeding the storm sewer systems level-of-service up through the critical 100-year event.
- NA In sub-areas of a landlocked watershed, the proposed project does not increase the predevelopment volume or rate of discharge from the sub-area for the 10-year return period event.

### **Middle St. Croix Watershed Management Organization**

#### MEMBER COMMUNITIES:

Afton, Bayport, Baytown Township, Lakeland, Lakeland Shores, Lake St. Croix Beach, Oak Park Heights, St. Mary's Point, Stillwater and West Lakeland Township



- NA Flowage easements up to the 100-yr flood level have been secured for stormwater management facilities (such as ditches and storm sewers).
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  1. New Nonlinear Development 1.1" \* new impervious surfaces
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  3. Linear Projects 0.55" \* new and/or fully reconstructed impervious surface and 1.1" from net increase in impervious area
  4. Sites with Restrictions- flexible treatment options documentation has been provided.

Volume Retention Required (cu. ft.)	Volume Retention Provided (cu. ft.)	
xx,xxx sf *1.1" = xxx cu. ft.	<b>BMP</b>	<b>Volume</b>
xx,xxx sf *1.1" = x,xxx cu. ft.	BMP #1	x,xx cu. ft.
	BMP #2	x,xxx cu. ft.
	<b>Total Proposed</b>	<b>x,xxx cu.ft.</b>
<b>Total Required</b>		<b>x,xxx cu. ft.</b>

**Flexible Treatment Options (when applicable)**

- NA Applicant demonstrated qualifying restrictions as defined in Section 7.2.2 (4) of the 2015 MSCWMO Watershed Management Plan that prohibits the infiltration of the entire required volume.
- NA MIDS calculator submission removes 75% of the annual total phosphorous.

**Infiltration/Filtration Design Standards**

- NA Proposed stormwater management features meet or exceed NPDES General Construction Permit requirements are designed in conformance with the most recent edition of the State of Minnesota Stormwater Manual.
- NA None of the following conditions exist that prohibit infiltration of stormwater on the site
  - a. Areas where vehicle fueling and maintenance occur.
  - b. Areas with less than three (3) feet of separation distance from the bottom of the infiltration system to the elevation of the seasonally saturated soils or the top of bedrock.
  - c. Areas where industrial facilities are not authorized to infiltrate industrial stormwater under an National Pollutant Discharge Elimination System (NPDES)/State Disposal System (SDS) Industrial Stormwater Permit issued by the MPCA.

**Middle St. Croix Watershed Management Organization**

MEMBER COMMUNITIES:

Afton, Bayport, Baytown Township, Lakeland, Lakeland Shores, Lake St. Croix Beach, Oak Park Heights, St. Mary’s Point, Stillwater and West Lakeland Township

- d. Areas where contaminants in soil or groundwater will be mobilized by infiltrating stormwater.
- e. Areas of Hydrologic Soil Group D (clay) soils
- f. Areas within 1,000 feet up-gradient, or 100 feet down-gradient of active karst features unless allowed by a local unit of government with a current MS4 permit.

NA Minimum setbacks from the Minnesota Department of Health for infiltration practices are met

<b>Setback</b>	<b>Minimum Distance (ft)</b>
Property line	10
Building foundation*	10
Private well	35
Public water supply well	50
Septic system tank/leach field	35
*Minimum with slopes directed away from the building	

NA Pretreatment device(s) remove at least 50% of sediment loads. If downstream from a potential hot spot, a skimmer is in place to facilitate cleanup.

NA Water quality volume will be discharged through infiltration or filtration media in 48 hours or less.

- a. For bioretention (biofiltration and bioinfiltration) volume control management facilities above ground with vegetation the period of inundation shall be calculated using the maximum water depth below the surface discharge elevation and the soil infiltration rate.
- b. For infiltration basin volume control management facilities the period of inundation shall be calculated using the maximum water depth below the surface discharge elevation and the soil infiltration rate.

NA Appropriate soil borings have been conducted that meet the minimum standards.

- a. A minimum of one boring was conducted at the location of the infiltration facility for facilities up to 1,000 ft<sup>2</sup>; between 1,000 and 5,000 ft<sup>2</sup>, two borings, between 5,000 and 10,000 ft<sup>2</sup>, three borings and greater than 10,000 ft<sup>2</sup> 4 borings plus an additional boring for every 2,500 ft<sup>2</sup> beyond 12,500 ft<sup>2</sup>
- b. Soil borings extend a minimum of five feet below the bottom of the infiltration practice. If fractured bedrock is suspected, the soil boring goes to a depth of at least ten feet below the proposed bottom of the volume control facility.
- c. A minimum of three feet of separation to the seasonal water table and/or bedrock.
- d. Identify unified soil classification.

NA The least permeable soils horizon identified in the soil boring dictated the infiltration rate.

NA Additional flows are bypassed and are routed through stabilized discharge points.

**Middle St. Croix Watershed Management Organization**

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NA Filtration basin demonstrates a basin draw down between 24 hours and 48 hours.

NA Filtration system Iron Enhanced Sand Filter is sized to bind soluble phosphorous removal for 30 year functional life of the system using the published value of 17lbs.phosphorous removal per 20 yards of 5% by weight iron filings to 95% sand.

NA Identify as build survey and method to demonstrate infiltration or filtration basin is functioning.

NA Construction plans provide adequate construction guidance to prevent clogging or compaction and demonstrate performance.

- a. Excavation within 2.0 feet of final grade for infiltration/filtration systems is prohibited until contributing drainage areas are constructed and fully stabilized.
- b. Rigorous sediment and erosion controls planned to divert runoff away from the system.
- c. Installation of volume control facilities must occur in dry soil conditions. Excavation, soil placement and rapid stabilization of perimeter slopes must be accomplished prior to the next precipitation event.
- d. Excavation shall be performed by an excavator with a toothed bucket. Use excavator bucket to place materials. Construction equipment shall not be allowed into the basin.
- e. Prior to the release of any remaining fee or security, the permit holder must provide documentation that constructed volume control facilities perform as designed.

NA There is a way to visually verify the system is operating as designed.

NA A minimum 8.0' maintenance access is provided to all stormwater facilities.

## **WETLAND PERFORMANCE STANDARDS**

NA Direct discharge of stormwater to wetlands and all other water bodies without water quality treatment is prohibited.

NA Any potential changes to the hydrology of the wetland (i.e. changes to the outlet elevation or contributing drainage area) must be reviewed to evaluate the impact of both the existing and proposed wetland conditions and approved by the MSCWMO.

NA Land-altering activities shall not increase the bounce in water level or duration of inundation from a 2.0-inch 24-hour storm for any downstream wetland beyond the limit specified in Table 7.2 for the individual wetland susceptibility class.

## **Middle St. Croix Watershed Management Organization**

### MEMBER COMMUNITIES:

Afton, Bayport, Baytown Township, Lakeland, Lakeland Shores, Lake St. Croix Beach, Oak Park Heights, St. Mary's Point, Stillwater and West Lakeland Township

# MIDDLE ST. CROIX WATERSHED MANAGEMENT ORGANIZATION

455 HAYWARD AVE. N, OAKDALE, MINNESOTA 55128  
Phone 651.330.8220 x22 fax 651.330.7747 www.mscwmo.org



May 1, 2020

Eric Johnson, Administrator  
City of Oak Park Heights  
14168 Oak Park Blvd. N.  
Oak Park Heights, MN 55082

RE: Central Automotive, Oak Park Heights

Dear Mr. Johnson,

The Middle St. Croix Watershed Management Organization (MSCWMO) received an application for project review on April 14th, 2020 for the proposed Central Automotive development, located within MSCWMO boundaries and in the City of Oak Park Heights. The proposed project qualifies for full review under the MSCWMO 2015 MSCWMO Watershed Management Plan (WMP). The revised submittals contain sufficient information to determine compliance with the performance standards identified in Section 7.0 of the MSCWMO Watershed Management Plan. The MSCWMO recommends revision and resubmittal to address the following comments:

1. SWPPP is incomplete (see checklist for required items)
2. Demonstrate rate control with the following model corrections
  - a. Use separate pervious/impervious runoff calculations
  - b. Use appropriate CN to represent wooded conditions
  - c. Tc for S-22 does not seem reasonable because it is a smaller drainage area yet the time is longer than the existing Tc. There will not be much sheet flow for this DA, mostly shallow concentrated or channel flow.
3. The maximum ponding depth allowed for infiltration is 18".
4. The site is located in a high vulnerability Drinking Water Source Management Area (DWSMA) and Wellhead Protection Area (WHPA) therefore infiltration is probated.
5. Dedications or easements are needed over the stormwater facility
6. Maintenance agreement is required.

The enclosed checklist contains detailed information on project review and the policies and performance standards of the WMP. Feel free to contact me at 651-330-8220 x22 or [mdowning@mnwcd.org](mailto:mdowning@mnwcd.org) if you have any questions regarding these comments.

Sincerely,

Matt Downing  
MSCWMO, Interim Administrator

Enclosure



# PROJECT REVIEW

**MSCWMO Project Review ID:** 20-006

**Project Name:** Central Automotive

**Applicant:** Anderson Engineering

**Purpose:** Construction of a new automotive repair shop

**Location:** 59<sup>th</sup> St and Osgood Ave N, Oak Park Heights, MN

**Review date:** 05/01/20

**Recommendation:** Revise and resubmit. See red items in checklist and the following comments:

1. SWPPP is incomplete (see checklist for required items)
2. Demonstrate rate control with the following model corrections
  - a. Use separate pervious/impervious runoff calculations
  - b. Use appropriate CN to represent wooded conditions
  - c. Tc for S-22 does not seem reasonable because it is a smaller drainage area yet the time is longer than the existing Tc. There will not be much sheet flow for this DA, mostly shallow concentrated or channel flow.
3. The maximum ponding depth for infiltration allowed is 18".
4. The site is located in a high vulnerability Drinking Water Source Management Area (DWSMA) and Wellhead Protection Area (WHPA) therefore infiltration is probated.
5. Dedications or easements are needed over the stormwater facility
6. Maintenance agreement is required.

## Applicability:

- Any project undertaking grading, filling, or other land alteration activities that involve movement of 100 cubic yards of earth or removal of vegetation on greater than 10,000 square feet of land
- Any project that creates or fully reconstructs 6,000 square feet or more of impervious surface
- All major subdivisions or minor subdivisions that are part of a common plan of development. Major subdivisions are defined as subdivisions with 4 or more lots.
- Any project with wetland impacts
- Any project with grading within public waters
- Any project with grading within buffers

- Any project with grading within 40-feet of the bluff line
- Development projects that impact 2 or more of the member communities
- New or redevelopment projects within the St. Croix Riverway that require a building permit that adds five hundred (500) square feet or more of additional impervious surface
- Any project requiring a variance from the current local impervious surface zoning requirements for the property
- Any land development activity, regardless of size, that the City determines is likely to cause an adverse impact to an environmentally sensitive area or other property, or may violate any other erosion and sediment control standard set by the member community.

**SUBMITTAL ITEMS:**

Electronic submittals are highly encouraged

- A completed and signed project review application form and review fee
- Grading Plan/Mapping Exhibits
  - a. Property lines and delineation of lands under ownership of the applicant.
  - b. Delineation of existing on-site wetlands, shoreland and/or floodplain areas (including any buffers).
  - c. Ordinary High Water (OHW) elevations and datum, as determined by the MDNR (if applicable).
  - d. Existing and proposed site contour elevations related to NAVD 1988 datum (preferred) or NGVD, 1929. Datum must be noted on exhibits.
  - e. Drainage easements covering land adjacent to ponding areas, wetlands, and waterways up to their 100-year flood levels and covering all ditches and storm sewers. Access easements to these drainage easements and to other stormwater management facilities shall also be shown.
  - f. Minimum building elevation for each lot.
  - g. Identification of downstream water body.
- Permanent Stormwater Management System in compliance with the requirements of the NPDES SDS Construction Stormwater Permit and MSCWMO Performance Standards.
  - a. Impervious areas (Pre- and Post-Construction).
  - b. Construction plans and specifications for all proposed stormwater management facilities.
  - c. Location(s) of past, current or future onsite well and septic systems (if applicable).
- Other exhibits required to show conformance to these Performance Standards
- A Stormwater Pollution Prevention Plan in compliance with the requirements of the NPDES SDS Construction Stormwater Permit

**Middle St. Croix Watershed Management Organization**

MEMBER COMMUNITIES:

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- Grading Plan/Mapping Exhibits:
- a. Delineation of the subwatersheds contributing runoff from off-site, proposed and existing on-site subwatersheds, and flow directions/patterns.
  - b. Location, alignment, and elevation of proposed and existing stormwater facilities.
  - c. Existing and proposed normal water elevations and the critical (the highest) water level produced from the 100-year 24-hour storms.
  - d. Location of the 100-year flood elevation, natural overflow elevation, and lowest floor elevations.
- Hydrologic/Hydraulic Design Exhibits:
- a. All hydrologic and hydraulic computations completed to design the proposed stormwater management facilities shall be submitted. Model summaries must be submitted. The summaries shall include a map that corresponds to the drainage areas in the model and all other information used to develop the model.
  - b. A table (or tables) must be submitted showing the following:
    - i. A listing of all points where runoff leaves the site and the existing and proposed stormwater runoff rates and volumes.
    - ii. A listing of the normal water levels under existing and proposed conditions and the water levels produced from the storm and runoff events listed above for all on-site wetlands, ponds, depressions, lakes, streams, and creeks.
- Dedications or easements for the portions of the property which are adjacent to the facility and which lie below the 100 year flood level. For sites within public right-of-way, no easement is required.
- A proposed maintenance agreement, which may be in the format of Appendix K, or other form approved by the city.

## **HISTORY & CONSIDERATIONS:**

## **SPECIAL OR IMPAIRED WATER**

- This site drains to, and is within one mile of special or impaired water and complies with enhanced protections.
- a. Scenic or Recreational river C.1., C.2., C.3.
  - b. Scientific and Natural area C.1., C.2., C.3.
  - c. Waterbody with a TMDL C.1., C.2.
    - C.1. Stabilization initiated immediately and all soils protected in seven days/provide temp basin for five acres draining to common location.
    - C.2. Treat water quality volume of one inch of runoff by retaining on site unless not feasible due to site conditions (See Part III.D.1. design requirements).
    - C.3. Maintain buffer zone of 100 linear feet from Special Water.

### **Middle St. Croix Watershed Management Organization**

#### MEMBER COMMUNITIES:

Afton, Bayport, Baytown Township, Lakeland, Lakeland Shores, Lake St. Croix Beach, Oak Park Heights, St. Mary's Point, Stillwater and West Lakeland Township

## EROSION AND SEDIMENT CONTROL [A checked box indicates compliance]

- A Stormwater Pollution Prevention Plan (SWPPP) that meets the National Pollutant Discharge Elimination System (NPDES) requirements.

### Narrative

- Identify the person knowledgeable and experienced who will oversee the implementation of the SWPPP; the installation, inspection, and maintenance of the BMPs.
- a. Identifies the person who will oversee the BMP inspection and maintenance.
  - b. Identify the training requirements are satisfied.
  - c. Inspections performed once every 7 days.
  - d. Inspections performed within 24 hours of a rain event greater than 0.5 in/24 hours.
  - e. Inspection and Maintenance records include:
    - i. Date and time of inspection.
    - ii. Name of person(s) conducting inspections.
    - iii. Finding of inspections, including the specific location where corrective actions are needed.
    - iv. Corrective actions taken (including dates, times, and party completing maintenance activities).
    - v. Date and amount of rainfall events greater than 0.5 in/24 hours.
    - vi. Rainfall amounts must be obtained by a properly maintained rain gauge installed onsite, or by a weather station that is within one mile or by a weather reporting system.
    - vii. Requirements to observe, describe, and photograph any discharge that may be occurring during the inspection.
    - viii. All discovered nonfunctional BMPs must be repaired, replaced, or supplemented with functional BMPs within 24 hours after discovery, or as soon as field conditions allow.
- Describes procedures to amend the SWPPP and establish additional temporary ESC BMPs as necessary for site conditions.
- Describes the installation timing for all Erosion Sediment Control (ESC) Best Management Practices (BMPs).
- Describes final stabilization methods for all exposed areas.
- Methods used to minimize soil compaction and preserve topsoil must be described.
- Describes dewatering technique to prevent nuisance conditions, erosion, or inundation of wetlands?
- NA Identifies any specific chemicals and the chemical treatment systems that may be used for enhancing the sedimentation process on the site, and how compliance will be achieved with the permit requirements.
- Describes pollution prevention management measures
- a. Storage, handling, and disposal of construction products, materials, and wastes.

## **Middle St. Croix Watershed Management Organization**

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- b. Fueling and maintenance of equipment or vehicles; spill prevention and response.
- c. Vehicle and equipment washing.
- d. No engine degreasing allowed on site.
- e. Containment of Concrete and other washout waste.
- f. Portable toilets are positioned so that they are secure.

#### *Plan sheets*

NA Temporary Sediment Basins required (10 acres draining to common location or **5 acres App. A**)  
Basin design meets the following criteria:

- a. Adequately sized – 2-year, 24-hour storm, minimum 1,800 feet/acre; or no calculative minimum 3,600ft<sup>3</sup>/acre.
- b. Designed to prevent short circuiting.
- c. Outlets designed to remove floating debris.
- d. Outlets designed to allow complete drawdown.
- e. Outlets designed to withdraw water from the surface
- f. Outlets have energy dissipation.
- g. Have a stabilized emergency spillway.
- h. Situated outside of surface waters and any natural buffers.
- Locations and types of all temporary and permanent Erosion Control BMPs.
  - a. Exposed soils have erosion protection/cover initiated immediately and finished within 7 days.
  - b. Wetted perimeters of ditches stabilized within 200 feet of surface water within 24 hours.
  - c. Pipe outlets have energy dissipation within 24 hours of connecting.
- Locations and types of all temporary and permanent Sediment Control BMPs.
  - a. Sediment control practices established on down gradient perimeters and upgradient of any buffer zones.
  - b. All inlets are protected.
  - c. Stockpiles have sediment control and placed in areas away from surface waters or natural buffers.
  - d. Construction site entrances minimize street tracking?

### **Middle St. Croix Watershed Management Organization**

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e. Plans minimize soil compaction and, unless infeasible to preserve topsoil.

f. 50 foot natural buffers preserved or (if not feasible) provide redundant sediment controls when a surface water is located within 50 feet of the project’s earth disturbances and drains to the surface water.

**Tabulated quantities of all erosion prevention and sediment control BMPs.**

Stormwater flow directions and surface water divides for all pre- and post-construction drainage areas.

Locations of areas not to be disturbed (buffer zones).

Location of areas where construction will be phased to minimize duration of exposed soil areas.

NA Blufflines are protected from construction activities in urban (40 foot buffer) areas and rural areas (100-foot buffer).

**LAKE, STREAM AND WETLAND BUFFERS**

NA A buffer zone of unmowed natural vegetation is maintained or created upslope of all water bodies (wetlands, streams, lakes).

NA A 50 foot natural buffer or (if a buffer is infeasible) provide redundant sediment controls when a surface water is located within 50 feet of the project’s earth disturbances and stormwater flows to the surface water.

NA If adjacent to a Special or Impaired Water an undisturbed buffer zone of not less than 100 linear feet from the special water is maintained both during construction and as a permanent feature post construction.

**STORMWATER MANAGEMENT** *[A checked box indicates compliance]*

Water quality treatment is provided prior to direct discharge of stormwater to wetlands and all other water bodies.

***Rate and Flood Control Standards***

The peak rate of stormwater runoff from a newly developed or redeveloped site shall not exceed the 2-, 10-, and 100-year 24-hour storms with respective 2.8, 4.2, and 7.3-inch rainfall depths with MSCWMO approved time distribution based on Atlas 14 for existing and proposed conditions. The runoff curve number for existing agriculture areas shall be less than or equal to the developed condition curve number. The newly developed or redeveloped peak rate shall not exceed the existing peak rate of runoff for all critical duration events, up to and including the 100-year return frequency storm event for all points where discharges leave a site during all phases of development.

**Predevelopment conditions assume “good hydrologic conditions” for appropriate land covers** as identified in TR-55 or an equivalent methodology. Runoff curve numbers have been increased where predevelopment land cover is cropland:

- Hydrologic Soil Group A: Runoff Curve Number 56
- Hydrologic Soil Group B: Runoff Curve Number 70
- Hydrologic Soil Group C: Runoff Curve Number 79
- Hydrologic Soil Group D: Runoff Curve Number 83

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Computer modeling analyses includes secondary overflows for events exceeding the storm sewer systems level-of-service up through the critical 100-year event.

NA In sub-areas of a landlocked watershed, the proposed project does not increase the predevelopment volume or rate of discharge from the sub-area for the 10-year return period event.

Flowage easements up to the 100-yr flood level have been secured for stormwater management facilities (such as ditches and storm sewers).

Lowest floor elevations of structures built adjacent to stormwater management features and other water bodies are a minimum of two feet above the 100-year flood elevation and a minimum of two feet above the natural overflow of landlocked basins.

**Volume Control Standards**

Calculations/computer model results indicate stormwater volume is controlled for new development and redevelopment requirements per the MSCWMO Design Standards.

1. New Nonlinear Development 1.1" \* new impervious surfaces
2. Reconstruction/Redevelopment Projects 1.1" \* reconstructed impervious surfaces
3. Linear Projects 0.55" \* new and/or fully reconstructed impervious surface and 1.1" from net increase in impervious area
4. Sites with Restrictions- flexible treatment options documentation has been provided.

Volume Retention Required (cu. ft.)	Volume Retention Provided (cu. ft.)	
21040 sf *1.1" = 1929 cu. ft.	<b>BMP</b>	<b>Volume</b>
	BMP #1	3974 cu. ft.
<b>Total Required</b>	<b>Total Proposed</b>	<b>3974 cu.ft.</b>
<b>1929cu. ft.</b>		

**Flexible Treatment Options (when applicable)**

NA Applicant demonstrated qualifying restrictions as defined in Section 7.2.2 (4) of the 2015 MSCWMO Watershed Management Plan that prohibits the infiltration of the entire required volume.

NA MIDS calculator submission removes 75% of the annual total phosphorous.

**Infiltration/Filtration Design Standards**

Proposed stormwater management features meet or exceed NPDES General Construction Permit requirements are designed in conformance with the most recent edition of the State of Minnesota Stormwater Manual.

None of the following conditions exist that prohibit infiltration of stormwater on the site

**Middle St. Croix Watershed Management Organization**

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- a. **Areas where vehicle fueling and maintenance occur.**
- b. Areas with less than three (3) feet of separation distance from the bottom of the infiltration system to the elevation of the seasonally saturated soils or the top of bedrock.
- c. Areas where industrial facilities are not authorized to infiltrate industrial stormwater under an National Pollutant Discharge Elimination System (NPDES)/State Disposal System (SDS) Industrial Stormwater Permit issued by the MPCA.
- d. Areas where contaminants in soil or groundwater will be mobilized by infiltrating stormwater.
- e. Areas of Hydrologic Soil Group D (clay) soils
- f. Areas within 1,000 feet up-gradient, or 100 feet down-gradient of active karst features unless allowed by a local unit of government with a current MS4 permit.

Minimum setbacks from the Minnesota Department of Health for infiltration practices are met

Setback	Minimum Distance (ft)
Property line	10
Building foundation*	10
Private well	35
Public water supply well	50
Septic system tank/leach field	35
*Minimum with slopes directed away from the building	

Pretreatment devices(s) remove at least 50% of sediment loads. If downstream from a potential hot spot, a skimmer is in place to facilitate cleanup.

**Water quality volume will be discharged through infiltration or filtration media in 48 hours or less.**

- a. For bioretention (biofiltration and bioinfiltration) volume control management facilities above ground with vegetation the period of inundation shall be calculated using the maximum water depth below the surface discharge elevation and the soil infiltration rate.
- b. For infiltration basin volume control management facilities the period of inundation shall be calculated using the maximum water depth below the surface discharge elevation and the soil infiltration rate.

**Appropriate soil borings have been conducted that meet the minimum standards.**

- a. A minimum of one boring was conducted at the location of the infiltration facility for facilities up to 1,000 ft<sup>2</sup>; between 1,000 and 5,000 ft<sup>2</sup>, two borings, between 5,000 and 10,000 ft<sup>2</sup>, three borings and greater than 10,000 ft<sup>2</sup> 4 borings plus an additional boring for every 2,500 ft<sup>2</sup> beyond 12,500 ft<sup>2</sup>
- b. Soil borings extend a minimum of five feet below the bottom of the infiltration practice. If fractured bedrock is suspected, the soil boring goes to a depth of at least ten feet below the proposed bottom of the volume control facility.
- c. A minimum of three feet of separation to the seasonal water table and/or bedrock.

**Middle St. Croix Watershed Management Organization**

MEMBER COMMUNITIES:

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d. Identify unified soil classification.

The least permeable soils horizon identified in the soil boring dictated the infiltration rate.

Additional flows are bypassed and are routed through stabilized discharge points.

NA Filtration basin demonstrates a basin draw down between 24 hours and 48 hours.

NA Filtration system Iron Enhanced Sand Filter is sized to bind soluble phosphorous removal for 30 year functional life of the system using the published value of 17lbs.phosphorous removal per 20 yards of 5% by weight iron filings to 95% sand.

Identify as build survey and method to demonstrate infiltration or filtration basin is functioning.

Construction plans provide adequate construction guidance to prevent clogging or compaction and demonstrate performance.

a. Excavation within 2.0 feet of final grade for infiltration/filtration systems is prohibited until contributing drainage areas are constructed and fully stabilized.

b. Rigorous sediment and erosion controls planned to divert runoff away from the system.

c. Installation of volume control facilities must occur in dry soil conditions. Excavation, soil placement and rapid stabilization of perimeter slopes must be accomplished prior to the next precipitation event.

d. Excavation shall be performed by an excavator with a toothed bucket. Use excavator bucket to place materials. Construction equipment shall not be allowed into the basin.

e. Prior to the release of any remaining fee or security, the permit holder must provide documentation that constructed volume control facilities perform as designed.

There is a way to visually verify the system is operating as designed.

A minimum 8.0' maintenance access is provided to all stormwater facilities.

## **WETLAND PERFORMANCE STANDARDS**

NA Direct discharge of stormwater to wetlands and all other water bodies without water quality treatment is prohibited.

NA Any potential changes to the hydrology of the wetland (i.e. changes to the outlet elevation or contributing drainage area) must be reviewed to evaluate the impact of both the existing and proposed wetland conditions and approved by the MSCWMO.

## **Middle St. Croix Watershed Management Organization**

### MEMBER COMMUNITIES:

Afton, Bayport, Baytown Township, Lakeland, Lakeland Shores, Lake St. Croix Beach, Oak Park Heights, St. Mary's Point, Stillwater and West Lakeland Township

NA Land-altering activities shall not increase the bounce in water level or duration of inundation from a 2.0-inch 24-hour storm for any downstream wetland beyond the limit specified in Table 7.2 for the individual wetland susceptibility class.

**Middle St. Croix Watershed Management Organization**

MEMBER COMMUNITIES:

Afton, Bayport, Baytown Township, Lakeland, Lakeland Shores, Lake St. Croix Beach, Oak Park Heights, St. Mary's Point, Stillwater and West Lakeland Township

**MIDDLE ST. CROIX WATERSHED MANAGEMENT  
ORGANIZATION CONSTRUCTION SITE  
INSPECTION PROGRAM**

Middle St. Croix WMO  
c/o Washington Conservation District  
455 Hayward Ave N  
Oakdale, MN 55128  
Phone: (651) 330-8220 x29  
[www.mscwmo.org](http://www.mscwmo.org)



**EROSION & SEDIMENT CONTROL  
INSPECTION REPORT**

Thomas Scanlan  
125 Lakeland Shores Rd  
Lakeland Shores, MN 55043

May 5, 2020  
MSCWMO Permit #: **UNKNOWN**  
Electronic-Mailed (x)

**Project: 125 Lakeland Shores Rd- Scanlan Residence**

Dear Mr. Scanlan,

The Middle St. Croix Watershed Management Organization (MSCWMO) conducted an inspection for erosion and sedimentation control issues at the site noted above on **5-5-2020**. The following report summarizes the field inspection findings and describes areas of compliance/non-compliance. Our inspections will be using the procedures and protocols defined in the Minnesota Pollution Control Agency (MPCA) National Pollutant Discharge Elimination System (NPDES) General Stormwater Permit for Construction Activity.

**Inspection information**

Is this inspection routine or in response to a storm event:  7 day  Rain

Rainfall amount (if applicable): \_\_\_\_\_

Is site within one aerial mile of special or impaired water that can potentially receive discharge from the site?  Yes  No

**St. Croix River**

**Note:** If NA is selected at any time, specify **why** in the comment area for that section.

**Erosion prevention requirements**

	<b>Yes</b>	<b>No</b>	<b>NA</b>
1. Are soils stabilized where no construction activity has occurred for 14 days (including stockpiles)? (7 days where applicable, or 24 hours during Minnesota Department of Natural Resources [DNR] Fish Spawning restrictions)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2. Has the need to disturb steep slopes been minimized?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. If steep slopes are disturbed, are stabilization practices designed for steep slopes used?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4. All ditches/swales stabilized 200' back from point of discharge or property edge within 24 hours? (Mulch, hydromulch, tackifier, or similar best management practices [BMPs] are not acceptable in ditches/swales if the slope is greater than 2%)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5. Do pipe outlets have energy dissipation (within 24 hours of connection)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
6. Is construction phasing being followed in accordance with the approved construction plans?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
7. Are areas not to be disturbed marked off (flags, signs, etc.)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**Comments:**

**Bluff is not disturbed. All current work is on detached garage upslope of bluff.**

## Sediment control requirements

	Yes	No	NA
1. Are perimeter sediment controls installed properly on all down gradient perimeters?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Are appropriate BMPs installed protecting inlets, catch basins, and culvert inlets?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3. Is a required buffer preserved around all streams, lakes, and wetlands during construction?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Has buffer monumentation been installed?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4. Do all erodible stockpiles have perimeter control in place?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5. Is there a temporary sediment basin on site, and is it built as shown in the approved stormwater management plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
6. Is soil compaction being minimized where not designed for compaction?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
7. Is topsoil being preserved unless infeasible?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

### Comments:

**Biologs were used on west side of disturbed area, additional biologs on site were about to be placed on the east side of disturbed area for garage and to protect existing rain garden. Confirmed with talk with contractor Tony on site.**

## Maintenance and inspections

	Yes	No	NA
1. Are all previously stabilized areas maintaining ground cover?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2. Are perimeter controls maintained and functioning properly, sediment removed when one-half full?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Are inlet protection devices maintained and adequately protecting inlets?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4. Are the temporary sediment basins being maintained and functioning properly?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5. Are vehicle tracking BMPs at site exists in place and maintained and functioning properly?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
6. Is all tracked sediment being removed within 24 hours?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Have all surface waters, ditches, conveyances, and discharge points been inspected?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
8. Were any discharges seen during this inspection (i.e., sediment, turbid water, or otherwise)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

If yes, record the location of all points of discharge. Photograph and describe the discharge (size, color, odor, foam, oil sheen, time, etc.). Describe how the discharge will be addressed. Was the discharge a sediment delta? If yes, will the delta be recovered within seven days and in accordance with item 11.5 of the NPDES permit?

### Comments:

**Driveway is paved, no tracking.**



## Other

	Yes	No	NA
1. Are pollution prevention management measures for solid waste, hazardous material, concrete, and truck washing in place?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2. Is any dewatering occurring on site?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
If yes, what BMPs are being used to ensure that clean water is leaving the site and the discharge is not causing erosion or scour?			
3. If chemical flocculants are used, is there a chemical flocculant plan in place?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4. Will a permanent stormwater management system be created for this project if required and in accordance with Section 15 of the NPDES permit?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
If yes, describe:			
5. If infiltration/filtration systems are being constructed, are they marked and protected from compaction and sedimentation?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
6. Description of areas of non-compliance noted during the inspection, required corrective actions, and recommended date of completion of corrective actions: <b>None at this time.</b>			
7. Potential areas of future concern: <b>Continue monitoring for potential sediment moving over bluff. Site is in good condition at this time.</b>			

## Maintenance and Compliance Summary

Overall Site Grade: **A**

A status described above as non-compliant indicates a permit violation that must be addressed in accordance with the NPDES Permit. Follow-up inspections will be conducted on a regular basis. Please contact me or Matt Downing at 651-330-8220 x29 if you have any questions.

Respectfully,

Aaron DeRusha  
612-816-7995  
MSCWMO Inspector  
Cc: Matt Downing, MSCWMO

### GRADE DESCRIPTIONS

**A** The site is in full compliance, all practices are in place, and the site is well maintained.

**B** The site is in compliance, but normal maintenance activities are required.

**C** The site is not in compliance. Maintenance or supplemental practices are required.

**D** The site is not in compliance. Erosion and sediment control practices are in poor condition and controllable water resource or off-site impacts are likely. Contact the District for a follow up inspection as soon as correction measures have been taken.

**F** The site is in severe non-compliance.

**MIDDLE ST. CROIX WATERSHED MANAGEMENT  
ORGANIZATION CONSTRUCTION SITE  
INSPECTION PROGRAM**

Middle St. Croix WMO  
c/o Washington Conservation District  
455 Hayward Ave N  
Oakdale, MN 55128  
Phone: (651) 330-8220 x29  
[www.mscwmo.org](http://www.mscwmo.org)



**EROSION & SEDIMENT CONTROL  
INSPECTION REPORT**

Matt and Shannon Stordahl  
16884 Island Terr  
Lakeland, MN 55044

May 5, 2020  
MSCWMO Permit #: **19-006**  
Electronic-Mailed (x)

**Project: Stordahl Home Reconstruction**

Dear Mr. & Mrs. Stordahl:

The Middle St. Croix Watershed Management Organization (MSCWMO) conducted an inspection for erosion and sedimentation control issues at the site noted above on **5-5-2020**. The following report summarizes the field inspection findings and describes areas of compliance/non-compliance. Our inspections will be using the procedures and protocols defined in the Minnesota Pollution Control Agency (MPCA) National Pollutant Discharge Elimination System (NPDES) General Stormwater Permit for Construction Activity.

**Inspection information**

Is this inspection routine or in response to a storm event:  7 day  Rain

Rainfall amount (if applicable): \_\_\_\_\_

Is site within one aerial mile of special or impaired water that can potentially receive discharge from the site?  Yes  No

**St. Croix River**

**Note:** If NA is selected at any time, specify **why** in the comment area for that section.

**Erosion prevention requirements**

	Yes	No	NA
1. Are soils stabilized where no construction activity has occurred for 14 days (including stockpiles)? (7 days where applicable, or 24 hours during Minnesota Department of Natural Resources [DNR] Fish Spawning restrictions)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2. Has the need to disturb steep slopes been minimized?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. If steep slopes are disturbed, are stabilization practices designed for steep slopes used?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4. All ditches/swales stabilized 200' back from point of discharge or property edge within 24 hours? (Mulch, hydromulch, tackifier, or similar best management practices [BMPs] are not acceptable in ditches/swales if the slope is greater than 2%)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5. Do pipe outlets have energy dissipation (within 24 hours of connection)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
6. Is construction phasing being followed in accordance with the approved construction plans?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
7. Are areas not to be disturbed marked off (flags, signs, etc.)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

**Comments:**

**Small area of disturbance where utilities were ran should get covered or seeded.**

**Areas where rain gardens are to be constructed are not flagged, but contractor is aware compaction may become an issue and will rip soil before constructing rain gardens if necessary.**

## Sediment control requirements

	Yes	No	NA
1. Are perimeter sediment controls installed properly on all down gradient perimeters?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Are appropriate BMPs installed protecting inlets, catch basins, and culvert inlets?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3. Is a required buffer preserved around all streams, lakes, and wetlands during construction?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Has buffer monumentation been installed?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4. Do all erodible stockpiles have perimeter control in place?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5. Is there a temporary sediment basin on site, and is it built as shown in the approved stormwater management plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
6. Is soil compaction being minimized where not designed for compaction?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Is topsoil being preserved unless infeasible?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**Comments:**

**Silt fence enhanced with wood chip biologs are being used in downgradient areas.**

**Rain garden areas have not been significantly disturbed yet.**

## Maintenance and inspections

	Yes	No	NA
1. Are all previously stabilized areas maintaining ground cover?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2. Are perimeter controls maintained and functioning properly, sediment removed when one-half full?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Are inlet protection devices maintained and adequately protecting inlets?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4. Are the temporary sediment basins being maintained and functioning properly?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5. Are vehicle tracking BMPs at site exists in place and maintained and functioning properly?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Is all tracked sediment being removed within 24 hours?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Have all surface waters, ditches, conveyances, and discharge points been inspected?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
8. Were any discharges seen during this inspection (i.e., sediment, turbid water, or otherwise)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

If yes, record the location of all points of discharge. Photograph and describe the discharge (size, color, odor, foam, oil sheen, time, etc.). Describe how the discharge will be addressed. Was the discharge a sediment delta? If yes, will the delta be recovered within seven days and in accordance with item 11.5 of the NPDES permit?

**Comments:**

**Perimeter controls are in good condition.**

## Other

	Yes	No	NA
1. Are pollution prevention management measures for solid waste, hazardous material, concrete, and truck washing in place?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2. Is any dewatering occurring on site?  If yes, what BMPs are being used to ensure that clean water is leaving the site and the discharge is not causing erosion or scour?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3. If chemical flocculants are used, is there a chemical flocculant plan in place?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4. Will a permanent stormwater management system be created for this project if required and in accordance with Section 15 of the NPDES permit?  If yes, describe: <b>2 raingardens- NW corner and SE corner</b>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. If infiltration/filtration systems are being constructed, are they marked and protected from compaction and sedimentation?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
6. Description of areas of non-compliance noted during the inspection, required corrective actions, and recommended date of completion of corrective actions:  <b>Small area of disturbed soil near road where utilities were ran should get covered or seeded if work is complete in this area.</b>			
7. Potential areas of future concern:  <b>Monitor silt fence and biologs near bluff frequently and address any failures as they occur.</b> <b>Monitor for compaction in proposed rain garden areas.</b> <b>Continue street sweeping as necessary.</b> <b>Ground cover (straw mulch, hydromulch, etc) should be placed on any areas not being driven on by machinery.</b>			

## Maintenance and Compliance Summary

Overall Site Grade: **B**

A status described above as non-compliant indicates a permit violation that must be addressed in accordance with the NPDES Permit. Follow-up inspections will be conducted on a regular basis. Please contact Matt Downing at 651-330-8220 x29 if you have any questions.

Respectfully,

Aaron DeRusha  
MSCWMO Inspector  
Cc: Matt Downing, MSCWMO

### GRADE DESCRIPTIONS

**A** The site is in full compliance, all practices are in place, and the site is well maintained.

**B** The site is in compliance, but normal maintenance activities are required.

**C** The site is not in compliance. Maintenance or supplemental practices are required.

**D** The site is not in compliance. Erosion and sediment control practices are in poor condition and controllable water resource or off-site impacts are likely. Contact the District for a follow up inspection as soon as correction measures have been taken.

**F** The site is in severe non-compliance.

**MIDDLE ST. CROIX WATERSHED MANAGEMENT  
ORGANIZATION CONSTRUCTION SITE  
INSPECTION PROGRAM**

Middle St. Croix WMO  
c/o Washington Conservation District  
455 Hayward Ave N  
Oakdale, MN 55128  
Phone: (651) 330-8220 x29  
[www.mscwmo.org](http://www.mscwmo.org)



**EROSION & SEDIMENT CONTROL  
INSPECTION REPORT**

Robert Lind  
MN Party Bus  
1445 Neal Ave  
West Lakeland, MN 55042

May 5, 2020

MSCWMO Permit #: **18-010**  
Electronic-Mailed (x)

**Project: 2<sup>nd</sup> Street Commercial Development- MN Party Bus**

Dear Mr. Lind,

The Middle St. Croix Watershed Management Organization (MSCWMO) conducted an inspection for erosion and sedimentation control issues at the site noted above on **5-5-2020**. The following report summarizes the field inspection findings and describes areas of compliance/non-compliance. Our inspections will be using the procedures and protocols defined in the Minnesota Pollution Control Agency (MPCA) National Pollutant Discharge Elimination System (NPDES) General Stormwater Permit for Construction Activity.

**Inspection information**

Is this inspection routine or in response to a storm event:  7 day  Rain

Rainfall amount (if applicable): \_\_\_\_\_

Is site within one aerial mile of special or impaired water that can potentially receive discharge from the site?  Yes  No

**St. Croix River**

**Note:** If NA is selected at any time, specify **why** in the comment area for that section.

**Erosion prevention requirements**

	Yes	No	NA
1. Are soils stabilized where no construction activity has occurred for 14 days (including stockpiles)? (7 days where applicable, or 24 hours during Minnesota Department of Natural Resources [DNR] Fish Spawning restrictions)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2. Has the need to disturb steep slopes been minimized?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3. If steep slopes are disturbed, are stabilization practices designed for steep slopes used?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4. All ditches/swales stabilized 200' back from point of discharge or property edge within 24 hours? (Mulch, hydromulch, tackifier, or similar best management practices [BMPs] are not acceptable in ditches/swales if the slope is greater than 2%)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5. Do pipe outlets have energy dissipation (within 24 hours of connection)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
6. Is construction phasing being followed in accordance with the approved construction plans?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
7. Are areas not to be disturbed marked off (flags, signs, etc.)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

**Comments:**

**Site is open, sand and fill materials recently brought in.**

**Area where rain garden is proposed on NE corner is not protected- will need to be monitored for compaction and infiltration rate.**

## Sediment control requirements

	Yes	No	NA
1. Are perimeter sediment controls installed properly on all down gradient perimeters?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Are appropriate BMPs installed protecting inlets, catch basins, and culvert inlets?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3. Is a required buffer preserved around all streams, lakes, and wetlands during construction?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Has buffer monumentation been installed?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4. Do all erodible stockpiles have perimeter control in place?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5. Is there a temporary sediment basin on site, and is it built as shown in the approved stormwater management plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
6. Is soil compaction being minimized where not designed for compaction?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
7. Is topsoil being preserved unless infeasible?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

### Comments:

**Silt fence has been repaired since last inspection. Bottom flap is buried along boulder wall in combination with landscaping fabric on the site-side of the boulders. Dried fine sediments pooled in front of silt fence and lack of sediment on the off-site side of the boulder wall show perimeter control is working as intended.**

**One additional wood chip log or silt fence section should be placed in NW corner of site.**

## Maintenance and inspections

	Yes	No	NA
1. Are all previously stabilized areas maintaining ground cover?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2. Are perimeter controls maintained and functioning properly, sediment removed when one-half full?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Are inlet protection devices maintained and adequately protecting inlets?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4. Are the temporary sediment basins being maintained and functioning properly?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5. Are vehicle tracking BMPs at site exists in place and maintained and functioning properly?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Is all tracked sediment being removed within 24 hours?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Have all surface waters, ditches, conveyances, and discharge points been inspected?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
8. Were any discharges seen during this inspection (i.e., sediment, turbid water, or otherwise)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

If yes, record the location of all points of discharge. Photograph and describe the discharge (size, color, odor, foam, oil sheen, time, etc.). Describe how the discharge will be addressed. Was the discharge a sediment delta? If yes, will the delta be recovered within seven days and in accordance with item 11.5 of the NPDES permit?

### Comments:

**No sediment tracking observed at time of inspection. Rock entrance is installed.**

## Other

	Yes	No	NA
1. Are pollution prevention management measures for solid waste, hazardous material, concrete, and truck washing in place?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2. Is any dewatering occurring on site?  If yes, what BMPs are being used to ensure that clean water is leaving the site and the discharge is not causing erosion or scour?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3. If chemical flocculants are used, is there a chemical flocculant plan in place?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4. Will a permanent stormwater management system be created for this project if required and in accordance with Section 15 of the NPDES permit?  If yes, describe: <b>3 raingardens providing 1,545 cf of treatment with sediment pretreatment devices.</b>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. If infiltration/filtration systems are being constructed, are they marked and protected from compaction and sedimentation?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
6. Description of areas of non-compliance noted during the inspection, required corrective actions, and recommended date of completion of corrective actions:  <b>One additional section of silt fence or biolog is needed to seal in NW corner of site. Plan/timeline for final grade and stabilization should be provided as soils remain open and exterior work is mostly complete.</b>			
7. Potential areas of future concern:  <b>Proposed rain garden areas are not protected and being worked in- compaction and infiltration rate will need to be checked before project completion.</b>			

## Maintenance and Compliance Summary

Overall Site Grade: **B**

A status described above as non-compliant indicates a permit violation that must be addressed in accordance with the NPDES Permit. Follow-up inspections will be conducted on a regular basis. Please contact me or Matt Downing at 651-330-8220 x29 if you have any questions.

Respectfully,

Aaron DeRusha  
612-816-7995  
MSCWMO Inspector  
Cc: Matt Downing, MSCWMO

### GRADE DESCRIPTIONS

**A** The site is in full compliance, all practices are in place, and the site is well maintained.

**B** The site is in compliance, but normal maintenance activities are required.

**C** The site is not in compliance. Maintenance or supplemental practices are required.

**D** The site is not in compliance. Erosion and sediment control practices are in poor condition and controllable water resource or off-site impacts are likely. Contact the District for a follow up inspection as soon as correction measures have been taken.

**F** The site is in severe non-compliance.

**MIDDLE ST. CROIX WATERSHED MANAGEMENT  
ORGANIZATION CONSTRUCTION SITE  
INSPECTION PROGRAM**

Middle St. Croix WMO  
c/o Washington Conservation District  
455 Hayward Ave N  
Oakdale, MN 55128  
Phone: (651) 330-8220 x29  
[www.mscwmo.org](http://www.mscwmo.org)



**EROSION & SEDIMENT CONTROL  
INSPECTION REPORT**

Thomas & Judith Savage  
65 Lakeland Shores Road  
Lakeland, MN 55043

May 5, 2020  
MSCWMO Permit #: **NO PERMIT**  
Electronic-Mailed (x)

**Project: 65 Lakeland Shores Rd- Savage Bluff Retaining Wall**

Dear Mr. Lind,

The Middle St. Croix Watershed Management Organization (MSCWMO) conducted an inspection for erosion and sedimentation control issues at the site noted above on **5-5-2020**. The following report summarizes the field inspection findings and describes areas of compliance/non-compliance. Our inspections will be using the procedures and protocols defined in the Minnesota Pollution Control Agency (MPCA) National Pollutant Discharge Elimination System (NPDES) General Stormwater Permit for Construction Activity.

**Inspection information**

---

Is this inspection routine or in response to a storm event:  7 day  Rain

Rainfall amount (if applicable): \_\_\_\_\_

Is site within one aerial mile of special or impaired water that can potentially receive discharge from the site?  Yes  No

**St. Croix River**

**Note:** If NA is selected at any time, specify **why** in the comment area for that section.

**Erosion prevention requirements**

	Yes	No	NA
1. Are soils stabilized where no construction activity has occurred for 14 days (including stockpiles)? (7 days where applicable, or 24 hours during Minnesota Department of Natural Resources [DNR] Fish Spawning restrictions)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2. Has the need to disturb steep slopes been minimized?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. If steep slopes are disturbed, are stabilization practices designed for steep slopes used?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
4. All ditches/swales stabilized 200' back from point of discharge or property edge within 24 hours? (Mulch, hydromulch, tackifier, or similar best management practices [BMPs] are not acceptable in ditches/swales if the slope is greater than 2%)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5. Do pipe outlets have energy dissipation (within 24 hours of connection)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
6. Is construction phasing being followed in accordance with the approved construction plans?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
7. Are areas not to be disturbed marked off (flags, signs, etc.)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**Comments:**

**Slope itself was not disturbed, but the crest of the bluff was disturbed for replacement of the retaining wall.**



## Sediment control requirements

	Yes	No	NA
1. Are perimeter sediment controls installed properly on all down gradient perimeters?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Are appropriate BMPs installed protecting inlets, catch basins, and culvert inlets?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3. Is a required buffer preserved around all streams, lakes, and wetlands during construction?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Has buffer monumentation been installed?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4. Do all erodible stockpiles have perimeter control in place?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5. Is there a temporary sediment basin on site, and is it built as shown in the approved stormwater management plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
6. Is soil compaction being minimized where not designed for compaction?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
7. Is topsoil being preserved unless infeasible?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

### Comments:

**Silt fence was installed. Bottom flap was not buried, but contractor buried flap during inspection. Contractor agreed to add wood chip logs and keep in place until final shaping, seeding, and re-vegetation is complete. Final shaping is expected to be done in next few days, possibly end of day.**

## Maintenance and inspections

	Yes	No	NA
1. Are all previously stabilized areas maintaining ground cover?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2. Are perimeter controls maintained and functioning properly, sediment removed when one-half full?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3. Are inlet protection devices maintained and adequately protecting inlets?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4. Are the temporary sediment basins being maintained and functioning properly?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5. Are vehicle tracking BMPs at site exists in place and maintained and functioning properly?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
6. Is all tracked sediment being removed within 24 hours?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
7. Have all surface waters, ditches, conveyances, and discharge points been inspected?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
8. Were any discharges seen during this inspection (i.e., sediment, turbid water, or otherwise)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

If yes, record the location of all points of discharge. Photograph and describe the discharge (size, color, odor, foam, oil sheen, time, etc.). Describe how the discharge will be addressed. Was the discharge a sediment delta? If yes, will the delta be recovered within seven days and in accordance with item 11.5 of the NPDES permit?

### Comments:

## Other

	Yes	No	NA
1. Are pollution prevention management measures for solid waste, hazardous material, concrete, and truck washing in place?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2. Is any dewatering occurring on site?  If yes, what BMPs are being used to ensure that clean water is leaving the site and the discharge is not causing erosion or scour?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3. If chemical flocculants are used, is there a chemical flocculant plan in place?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4. Will a permanent stormwater management system be created for this project if required and in accordance with Section 15 of the NPDES permit?  If yes, describe:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5. If infiltration/filtration systems are being constructed, are they marked and protected from compaction and sedimentation?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
6. Description of areas of non-compliance noted during the inspection, required corrective actions, and recommended date of completion of corrective actions:  <b>Inspection was completed at request of WMO for an unpermitted/unreviewed site. Contractor had added silt fence at top of bluff. Contractor also agreed to add wood chip logs and keep in place until final shaping, seeding, and revegetation is complete.</b>			
7. Potential areas of future concern:			

## Maintenance and Compliance Summary

Overall Site Grade: **B**

A status described above as non-compliant indicates a permit violation that must be addressed in accordance with the NPDES Permit. Follow-up inspections will be conducted on a regular basis. Please contact me or Matt Downing at 651-330-8220 x29 if you have any questions.

Respectfully,

Aaron DeRusha  
612-816-7995  
MSCWMO Inspector  
Cc: Matt Downing, MSCWMO

### GRADE DESCRIPTIONS

**A** The site is in full compliance, all practices are in place, and the site is well maintained.

**B** The site is in compliance, but normal maintenance activities are required.

**C** The site is not in compliance. Maintenance or supplemental practices are required.

**D** The site is not in compliance. Erosion and sediment control practices are in poor condition and controllable water resource or off-site impacts are likely. Contact the District for a follow up inspection as soon as correction measures have been taken.

**F** The site is in severe non-compliance.

65 Lakeland Shores Rd,  
Savage Bluff Retaining Wall





125 Lakeland Shores Rd,  
Scanlan Garage



1635 Rivercrest Stordahl Home



1635 Rivercrest Stordahl Home



1635 Rivercrest Stordahl Home

2<sup>nd</sup> St Commercial- MN Party  
Bus





2<sup>nd</sup> St Commercial- MN Party  
Bus



2<sup>nd</sup> St Commercial- MN Party  
Bus



# MIDDLE ST. CROIX WATERSHED MANAGEMENT ORGANIZATION

455 HAYWARD AVENUE, OAKDALE, MINNESOTA 55082  
Phone 651.330.8220 x22 fax 651.330.7747 www.mscwmo.org



## Staff Report- April 2020

### Administration

- Prepared May meeting materials
- Performed required work to secure Lily Lake Grant

### Project Reviews

- 3rd and Myrtle Development-ACTION
- CenterPoint Energy Natural Gas-Quinlan Ave N.-ACTION
- Central Automotive-ACTION

### Lily Lake Phosphorus Reductions for Delisting – CWF Grant C20-6055

**Description:** Awarded \$513,500 for in-lake alum treatment and filtration basin to remove 120lbs of phosphorus from Lily Lake.

**Activities This Month:** Developed agreement with BWSR for the Alum treatment that is required by BWSR to receive grant funds. Completed the workplan and anticipate receiving grant funds after the May 15<sup>th</sup> deadline.

**Staff:** Bryan Pynn-WCD, Matt Downing-MSCWMO

### Lake St. Croix Direct Discharge Phase II and Phase III

**Description:** \$151,000 (phase II) and a \$34,000 (phase III) grants for stormwater quality improvements in Oak Park Heights, Stillwater and Bayport (2015-2019). Funding was utilized to work in partnership with the Stillwater Country Club to install a basin to reduce 25.0 lbs. of phosphorus per year discharging into Lake St. Croix.

**Activities This Month:** Basins have been planted and grants are closed out. Awaiting final payment.

**Staff:** Bryan Pynn-WCD, Matt Downing-MSCWMO

### Perro Creek Water Quality Improvements Phase I and Watershed Based Funding

**Description:** \$63,000 CWF grant and \$39,124 allocation from CWF Watershed Based Funding to design and install stormwater quality practices to reduce nutrients and bacteria discharging directly into Perro Creek and then to Lake St. Croix.

**Activities This Month:** Remaining items for Spring 2020 include planting basin 3, install mulch and edging on basin 3, observe raingarden function and turfgrass growth. There is a 5% retainage and about 2% of the project cost left to pay once work is complete in Spring 2020. Final reporting has been completed and payment from BWSR is in process. Maintenance was performed on one basin that was used as a yard waste dump by a homeowner.

**Staff:** Bryan Pynn, WCD

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### Watershed Based Funding- Lily Lake Raingardens

**Description:** \$39,636 CWF Watershed Based Funding allocation to improve water quality. The funding is approved to provide the design and installation of two raingardens on Lily Lake in Stillwater.

**Activities This Month:** No Activity - One basin installed; other basin removed from project. Will apply remaining WB funds to another project in 2020. Still looking at install options.

**Staff:** Bryan Pynn, WCD

### Lake St. Croix Small Communities Phosphorus Reduction Grant

**Description:** \$200,000 grant for stormwater quality improvement south of Bayport (2019-2021). Planning to work in partnership with City of Lake St. Croix Beach to stabilize the bluff on the north side of town.

**Activities This Month:** Met with Lake St Croix Beach and SHE multiple times. Reviewing SEH feasibility study on construction of bluff project. Addressing comments from concerned citizens and other agencies. Pushed starting work back to fall due to tree removal restrictions.

**Staff:** Bryan Pynn, WCD Matt Downing, MSCWMO

### 3M PFAS Settlement MPCA Staff Reimbursement Grant

**Description:** Up to \$20,000 reimbursement of staff time for both the Administrator and consultant (Stu Grub with EOR) to participate in the development of the groundwater model for the PFAS contamination in the southern portion of the watershed.

**Activities This Month:** Due to the COVID-19 shutdown little work has been performed.

**Staff:** Matt Downing, MSCWMO Stu Grub, EOR

### Microbial Source Tracking of *E. coli* in Perro Creek

**Description:** The MSCWMO and the City of Bayport agreed to partner on an effort to identify the source of *E. coli* contamination of Perro Creek. 4 locations on the creek were sampled for the presence or absence of human DNA in the bacteria. This effort is above and beyond the concentration monitoring already being conducted by the MSCWMO.

**Activities This Month:** Lab results are being summarized for the 2019 Monitoring Summary. Sampling for 2020 will resume late May/early June.

**Staff:** Rebecca Oldenburg Giebel, WCD

### Water Monitoring Program

**Description:** The MSCWMO water monitoring program includes the monitoring of flow at three sites. These sites have that equipment serves to collect data on the total volume of water flowing into Lily Lake at the Greeley Street Inlet, through Perro Creek at the Diversion Structure, as well as, the Perro Creek Diversion Structure Overflow. Water quality is also collected at the Greeley Street Inlet and the Perro Creek Diversion Structure on a monthly basis, as well as during storm events.

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Additionally, the MSCWMO monitors two lakes, Lily and McKusick for several parameters from April-October. Data is collected on both lakes on a biweekly basis and includes: water level, clarity, pH, temperature and dissolved oxygen profiles, an aesthetics and user profile, and field conditions. Additionally, water quality samples are collected from the surface of the lakes and analyzed for total phosphorus, total Kjeldahl nitrogen, and chlorophyll.

**Activities This Month:** 2019 MSCWMO Monitoring Summary draft is included in the meeting materials. 2020 monitoring activities have started, the Perro Creek and Greely Street flow stations were installed and lake monitoring on Lily and McKusick has begun.

**Staff:** Rebecca Oldenburg Giebel, WCD

### Erosion and Sediment Control Inspections

**Description:** The MSCWMO has contracted with the WCD to conduct erosion and sediment control inspections for construction projects that have been reviewed and recommended for permit approval by partner communities.

**Activities This Month:** Inspections were conducted on May 5 at 1635 Rivercrest-Stordahl Home, 2<sup>nd</sup> St Commercial MN Party Bus, 125 Lakeland Shores Rd- Scanlan Garage, and 65 Lakeland Shores Rd- Savage Bluff Retaining Wall. A minor perimeter control issue was noted at the MN Party Bus site where an additional biolog or silt fence section was recommended. Significant improvements to non-compliant items noted in previous reports has been made and the risk of erosion is now low at this site. No pressing issues were noted at the Stordahl or Scanlan projects. An inspection for unpermitted work done to replace a retaining wall on the crest of the bluff at 65 Lakeland Shores Rd at the Savage property was completed. The contractor had installed silt fence and agreed to add additional wood chip logs and to keep perimeter control in place until final shaping, seeding, and covering is complete. Perimeter control will remain in place with straw blanket and seed over disturbed areas until at least 70% of the disturbed area is re-vegetated. Inspection reports and photos are attached.

**Staff:** Aaron DeRusha WCD

### Meetings

- Lily Lake Delisting Strategy -Ongoing at will (remote)