

MIDDLE ST. CROIX WATERSHED MANAGEMENT ORGANIZATION

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



Regular Meeting of the Middle St. Croix Watershed Management Organization *Bayport Public Library* Thursday, May 12th, 2022 6:00PM

1. Call to Order – 6:00PM
 - a. Approval of Agenda
2. Approval of Minutes
 - a. Draft minutes – March 10th, 2022 **pg. 1-3**
3. Treasurer’s Report
 - a. Report of savings account, assets for May 12th, 2022
 - b. Approve payment of bills for May 12th, 2022
4. Public Comment
5. Old Business
6. New Business
 - a. Children’s Water Festival Sponsorship Request **pg. 4-5**
 - b. 2021 Water Monitoring Report Draft **pg. 6-45**
 - c. MCC Buffer Enhancement Agreement **pg. 46-49**
 - d. Riviera Treatment Train Bid Set **pg. 50**
 - e. Lily Lake Alum Treatment Amendment **pg. 51-52**
 - f. St. Croix Valley Regional Trail TAC **pg. 53**
7. Grant and Cost Share Applications
 - a. Goetl Turf to Prairie **pg. 54-55**
 - b. Kelly Native Planting **pg. 56-57**
8. Plan Reviews/Submittals
 - a. Plan Review and Submittal Summary **pg. 58-128**
 - i. MN Party Bus-**INFORM**
 - ii. Baylon Boathouse-**ACTION**
 - iii. Burton Walls-**ACTION**
 - iv. St. Michael’s Cemetery-**INFORM**
 - v. Park Dental-**ACTION**
 - vi. Inspiration-**INFORM**
 - vii. 2022 Stillwater Streets-**ACTION**
 - viii. MNDOT SP 8282-145-**ACTION**
 - ix. Northern Natural Gas-**INFORM**
 - b. Erosion and Sediment Control Inspection Reports **-NONE**

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9. Staff Report **pg. 129-131**
10. 1W1P Updates
 - a. Assign New Policy Committee Representative
11. Other
12. Adjourn

Regular Meeting of the Middle St. Croix Watershed Management Organization
Washington Conservation District
Thursday, March 10th, 2022
6:00PM

Present: Dan Kylo, West Lakeland Township; Ryan Collins, Stillwater; Beth Olfelt-Nelson, St. Mary's Point; Mike Runk, Oak Park Heights; Tom McCarthy, Lake St. Croix Beach; Avis Peters, Baytown Township; John Dahl, Bayport; Dawn Bullera, Lake St. Croix Beach Alternate; Administrator Matt Downing; Amanda Herbrand, WCD

Call to Order

Manager Kylo called the meeting to order at 6:03PM.

Approval of Agenda

Administrator Downing proposed an item under "Other": Consideration of post card mailing for erosion control. Manager Runk motioned to approve the agenda with this addition and Manager Collins seconded this. The motion carried on a roll call vote with all in favor.

Approval of Minutes

Manager Olfelt-Nelson motioned to approve the draft February 17th, 2022 board meeting minutes and Manager Runk seconded this motion. The motion carried on a roll call vote with all in favor.

Treasurer's Report

The treasurer's report and bills to be paid were presented by Manager Kylo. The remaining checking account balance on March 10th for the month of February 2022 was \$278,799.07. First State Bank CDs were valued at \$38,549.15. The ending balance in the RBC savings account for January was \$76,968.40 and \$76,972.32 for February.

Bills to be approved this month are: Metro Watershed Partners: \$500; People's Congregational Church: \$304.41; Washington Conservation District (4th Qtr 21 Grant Hours): \$5,426.49; Washington Conservation District (Administration): \$3,048.00; Washington Conservation District (Technical Services): \$6,630.00; Washington Conservation District (Grant Hours): \$2,472.42; Total: \$18,381.32.

Manager Runk motioned to accept the treasurer's report and pay the bills. Manager Collins seconded this motion. The motion carried on a roll call vote with all in favor.

Public Comment

There was no public comment.

Old Business

There was no old business.

3M PFAS Reimbursement Request

Administrator Downing requested board approval to submit a request of \$676.00 to the state for

PFAS work reimbursement. Manager Olfelt-Nelson motioned to approve the submittal of the reimbursement request. Manager Collins seconded the motion. The motion carried on a roll call vote with all in favor.

2021 Annual Report Draft

Administrator Downing presented the MSCWMO 2021 Annual Report Draft and invited board members to submit any comments. Manager Olfelt-Nelson asked a question regarding page 7 of the report: the page has a project map showing four projects installed in 2021. On the left side of the map, there are two boxes that indicate “65.3 lbs TP removed per year” and “16k lbs TSS removed per year.” In the paragraph above the map, TP is written out as total phosphorus, but TSS is not defined anywhere on the page. Administrator Downing agreed to make a change in the report to define the acronym, which stands for total suspended solids. Administrator Downing also made note that the map on this page is from the new previously approved database, and mentioned that a staff member from WCD would be attending an upcoming board meeting to give board members a tutorial on the database. Manager Runk motioned to approve the 2021 Annual Report Draft and Manager Olfelt-Nelson seconded the motion. The motion carried on a roll call vote with all in favor.

Grand and Cost Share Applications

There were no updates.

Plan Reviews/Submittals

MN Party Bus – INFORM

The applicant submitted a new plan on March 10th, the day of the meeting. The plan had not been reviewed at the time of the meeting.

Baylon Boathouse – INFORM

Nothing new has been received from the project. The applicant requested to go directly to the Lakeland Shores City Council.

Jambois Hillside Lift – INFORM

The contractor for the project was out of town and has since returned and is expected to provide the necessary items for approval.

Burton Walls and Patio – INFORM

The applicant has submitted some preliminary designs that are being reviewed.

Erosion and Sediment Control Inspection Reports

There were no new erosion and sediment control inspection reports.

Staff Report

Administrator Downing presented the staff report. He mentioned that Bryan Pynn of WCD, who has worked on numerous projects for MSCWMO over the years has resigned and accepted another position elsewhere. Through the transition of his leaving, he will continue to be involved as a consultant through an agreement with the WCD and his new employer.

1W1P Updates

Assign New Policy Committee Representative

Manager Fellegy was the representative to the Policy Committee for the Lower St. Croix Watershed Partnership, also referred to as One Watershed One Plan (1W1P). A new representative is needed as Manager Fellegy is no longer a member of the board. After some discussion, it was decided that Manager Runk will attend the upcoming meeting as the representative and the board will revisit assigning a new permanent committee representative. Manager Kylo motioned for Manager Runk to be the MSCWMO representative for the 1W1P Partnership for the upcoming meeting. Manager Olfelt-Nelson seconded the motion. The motion carried on a roll call vote with all in favor.

Other

Erosion Control Post Card Mailing

Last year there was a request from the board to create some informational post cards for bluff residents reminding them of what they should be doing to take care of the bluff and informing them of some potential indicators of problems with the bluff, with information on some action items they can perform and some contact information if they need assistance. It was decided that MSCWMO should have a new logo for the post card, and now that the logo has been decided and the post card has been created, they can be mailed. Administrator Downing is seeking final approval to mail out the post cards. Final cost for the printing and mailing is \$585. Manager Olfelt-Nelson motioned to spend \$585 to print and send out the cards. Manager Collins seconded the motion. The motion carried on a roll call vote with all in favor.

Adjourn

Manager Collin motioned to adjourn the meeting and Manager Kylo seconded this. The meeting was adjourned at 6:38.



April 12, 2022

Dear Matt Downing,

We are kicking off the fund-raising campaign for the **25th annual Metro Children's Water Festival (MCWF)**. Our last in-person festival was in 2019, before the Covid-19 pandemic. At that festival, we hosted 1,925 students from 24 schools around the metro area. Due to the Covid-19 pandemic, the festival switched to a virtual format for 2020 and 2021. The 2021 virtual festival hosted 1,892 students. The planning committee (committee), who organizes the MCWF, is hoping to hold the festival in-person for 2022. The committee is having conversations with school administrators, principals and teachers, along with public health officials, to discuss safe-guards that would need to be put in place for to ensure a safe festival for all. As this planning is taking place, the committee is fully prepared to switch to an on-line festival at any time it is necessary. But we are cautiously optimistic and excited at the idea of hosting at least some student's in-person.

What is the Children's Water Festival?

The festival is an interactive, hands-on, educational outreach program. The festival educates, motivates and challenges children to understand, conserve and protect water resources. It is one of the premier K-12 education events in the metro area and helps teachers achieve state and school district science standards for 4th grade. The festival is one of the largest education collaborations in the metro area and has been increasing awareness of water issues and solutions in students and adults for almost 25 years. Since it began in 1998 over 26,100 and 1,003 teachers have attended the in-person festivals.

Why sponsor the Children's Water Festival?

- It provides free education on water resources to 4th graders in the metro area.
- It inspires students to learn more about water resources and protect clean water for future generations.
- It provides science enrichment that helps teachers meet state education standards.
- It creates enthusiasm and awareness around one of our most precious resources.
- Be recognized as a business or entity that supports water and environmental learning. Sponsors are recognized at the festival, in the festival booklet, on <https://metrocnwf.org/sponsors/>, through press releases and articles, and receive a certificate of sponsorship. We can provide the CWF logo to put on your website.

How will funds be used?

The festival is provided free to students. Sponsored funds cover rental charges for the State Fair Grounds where it's hosted, presenter fees, food & beverages for volunteers and presenters, materials for certain activities, and website hosting and maintenance. Sponsorship also covers some busing costs for schools that cannot afford transportation. Most organizers and the planning committee members are from public and private agencies that volunteer their time and expertise.

How to sponsor

Fill out and return the enclosed sponsor form. Thank you for supporting this event that gives so much to the children of Minnesota and identifies the metro area as a national leader in environmental stewardship.

Learn more at <https://metrocnwf.org/>

Thank you,

Jessica Collin-Pilarski

Metro Children's Water Festival Planning Committee

651-430-6703 or jessica.collin-pilarski@co.washington.mn.us

Middle St. Croix Watershed Management Organization 2021 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, Secretary

John Dahl

Avis Peters

Brian Zeller, Chair

Joe Paiement

Tom McCarthy, Vice Chair

Mike Runk

Beth Olfelt-Nelson

Ryan Collins

Dan Kylo, Treasurer

Washington Conservation District

Matthew Downing, MSCWMO Administrator

Metropolitan Council

Brian Johnson

Monica Lorentz

Steven Louwerse

Mike Moger

Patricia Phua

Mallory Vanous

Sarah Voth

Minnesota Department of Natural Resources (MN DNR)

Sandy Fecht

Source Molecular Corporation

The WCD would also like to thank the volunteers and landowners who assist with data collection and allow property access.

TABLE OF CONTENTS

| | |
|---|----|
| ABBREVIATIONS, DEFINITIONS, ACRONYMS, AND SYMBOLS | 4 |
| EXECUTIVE SUMMARY | 5 |
| LAKE MONITORING | 8 |
| A. METHODS, RESULTS AND DISCUSSION..... | 8 |
| 1. LILY LAKE | 11 |
| 2. MCKUSICK LAKE | 12 |
| STREAM AND STORMWATER MONITORING..... | 17 |
| A. LILY LAKE INLET TARGETED MONITORING | 17 |
| B. PERRO CREEK MONITORING..... | 21 |
| C. BROWN’S CREEK DIVERSION STRUCTURE..... | 27 |
| MSCWMO: CONCLUSIONS AND RECOMMENDATIONS | 30 |
| A. LAKES..... | 30 |
| B. TARGETED MONITORING..... | 32 |
| C. STREAMS..... | 33 |
| APPENDIX A..... | A1 |
| WATER QUALITY DATA – LILY LAKE AND MCKUSICK LAKE | A1 |
| LILY LAKE..... | A3 |
| MCKUSICK LAKE..... | A5 |

ABBREVIATIONS, DEFINITIONS, 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- α | Chlorophyll- α |
| 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 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 |
| 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 |
| VSS | Volatile suspended solids |
| 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 2021, as well as previous years. In 2021 the Middle St. Croix Watershed Management Organization (MSCWMO) monitored water quality and water surface elevation on McKusick Lake and Lily Lake, and flow and water quality at the Greeley Street Inlet to Lily Lake and at Perro Creek at the Diversion Structure (Figure 1). The purpose of this monitoring is to assess and document current water quality conditions of the lakes and streams, as well as continuation of 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. Also included in this report is data collected at the Brown's Creek Diversion Structure, which is a tributary to McKusick Lake that is monitored by the WCD for the Brown's Creek Watershed District (BCWD).

Lake Monitoring

Lily Lake was classified as eutrophic and received a C+ grade in 2021 (APPENDIX A). Two samples exceeded the Minnesota Pollution Control Agency's (MPCA) standard for total phosphorus (TP), four samples exceeded the MPCA standard for chlorophyll- α (chl- α) corrected for pheophytin, three Secchi disk transparency readings exceeded the MPCA standard (APPENDIX A).

In 2021 McKusick Lake was classified as eutrophic and received a grade of B- (APPENDIX A). No samples exceeded the MPCA shallow lake standard for TP. One sample exceeded the MPCA standard for chl- α corrected for pheophytin and two Secchi disk transparency measurements exceeded the MPCA shallow lake standard (APPENDIX A).

Stream and Stormwater Monitoring

Monitoring continued at the Greeley Street inlet to Lily Lake in 2021 and the total recorded discharge was the second lowest recorded at the site at 4,747,103 cubic feet. This was due in large part to severe drought conditions. The average TP concentration from baseflow samples

was 0.081 mg/L, which was the highest since 2015. However, two samples had the lowest sampled concentrations for TP since monitoring began in 2015. The average total suspended solids (TSS) from baseflow samples was 5 mg/L, which was the highest since monitoring began in 2015, but still within the normal range for baseflow concentrations for the site. The average TP concentration from storm samples collected in 2021 was 0.360 mg/L, which was the highest storm average since 2016. The average TSS concentration from storm samples was 49 mg/L, which was the highest since 2018. TP and TSS loads to Lily Lake were calculated during monitored periods, and in 2021 the TP load was 27.1 lbs and the TSS load was 1,968 lbs.

Water quality sampling resumed on Perro Creek at the Diversion Structure in 2021, after no sampling occurred in 2020. Recorded discharge to the St. Croix River was 29,891,691 cubic feet, which included discharge through the overflow structure, and was a decrease from 2020. The average TP concentration from baseflow samples was 0.035 mg/L, which was similar to 2018 and 2019. The average baseflow TSS concentration was 2 mg/L, which was similar to 2019. The average storm sample TP concentration in 2021 was 0.427 mg/L, which was the highest since 2016. The average storm sample TSS was 217 mg/L, which was the highest since monitoring began in 2016. TP and TSS loads to the St. Croix River were calculated during monitored periods, and in 2021 the TP load was 81.5 lbs and the TSS load was 12,601 lbs.

Discharge at the Brown's Creek Diversion Structure site decreased from 2020 to 2021 due to drought conditions, with a volume of 46,792,341 cubic feet exported to McKusick Lake. The total annual TP load also decreased and was 446 lbs. while the annual TSS load increased and was 401,069 lbs. Concentrations of metals tended to be lower in 2021. There were three copper results and five lead results that exceeded MPCA chronic standards.

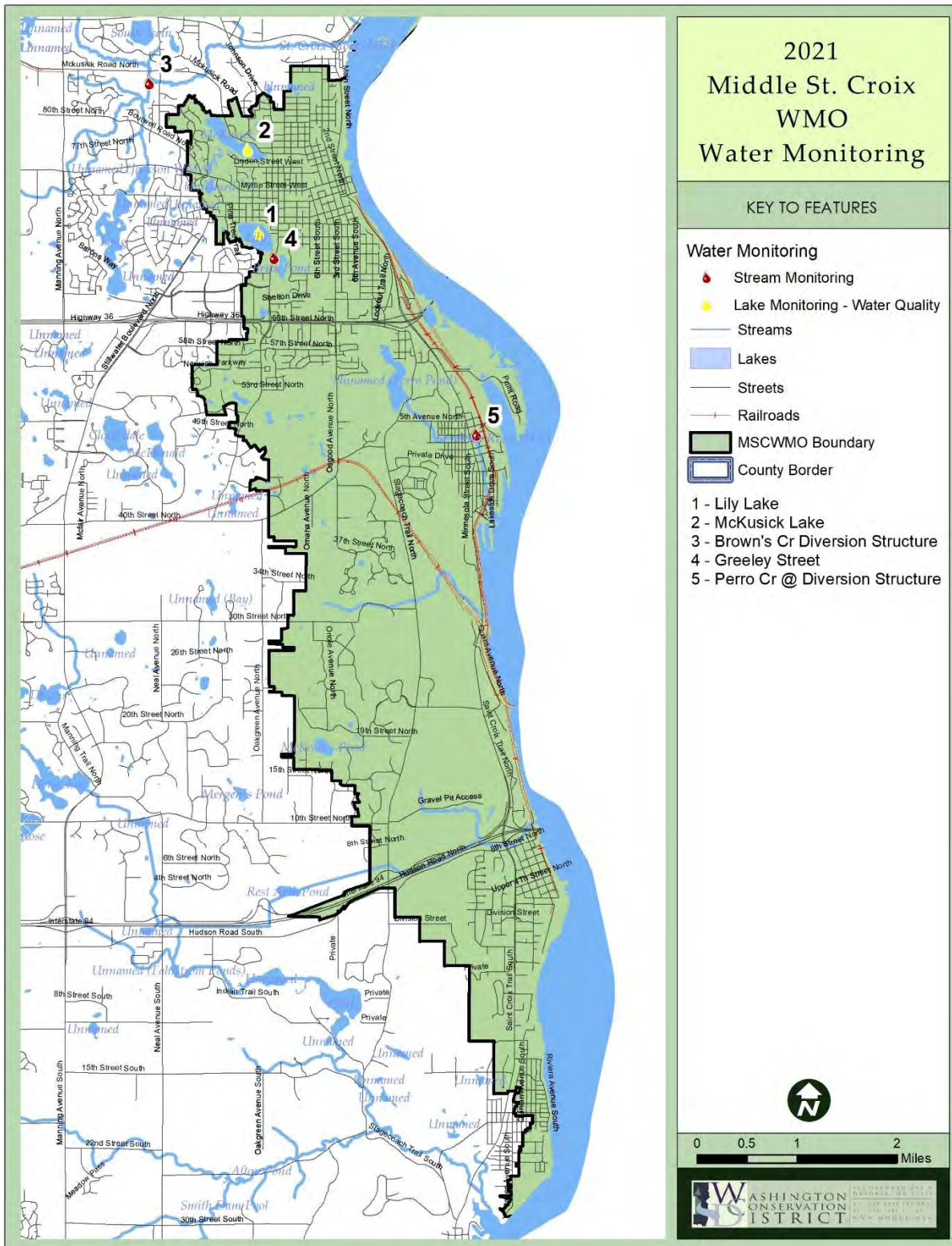


Figure 1. MSCWMO 2021 Water Monitoring Locations

LAKE MONITORING

A. METHODS, RESULTS AND DISCUSSION

In 2021 water quality data was collected biweekly on Lily Lake and McKusick Lake, over seven consecutive months (April–October) by the WCD. 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 2 through Figure 5, 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 (SOP) is available on the Washington Conservation District website at <http://www.mnwcd.org/water-monitoring>. The Metropolitan Council Environmental Services (MCES) Laboratory analyzed the surface water samples for TP, chl- α , and total Kjeldahl nitrogen (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 2021 summer average of TP values of MSCWMO lakes can be found in Figure 2.

Chlorophyll- α is measured because it’s the photosynthetic component found in algae and aquatic plants and is an indicator of algal productivity. The MPCA standard for pheophytin-corrected

chl- α is 14 $\mu\text{g/L}$ for deep lakes and 20 $\mu\text{g/L}$ for shallow lakes. The 2021 summer average chl- α concentrations of MSCWMO lakes can be found in Figure 3.

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 2021 summer average TKN concentrations of MSCWMO lakes can be found in Figure 4.

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. The 2021 summer average transparency of MSCWMO lakes can be found in Figure 5.

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 <https://webapp.pca.state.mn.us/surface-water/search>.

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- α , 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

| Grade | Percentile | TP ($\mu\text{g/L}$) | Chl-α ($\mu\text{g/L}$) | SD (m) |
|--------------|-------------------|--|---|---------------|
| 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- α , 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 2021. Lake elevation readings are compared to the lake's Ordinary High Water level (OHW)¹. 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 2021 for Lily Lake occurred on 7/7/2021 at 845.70 ft. and on 3/29/2021 at 854.35 ft. for McKusick Lake. Complete lake elevation data for 2021 can be found in APPENDIX A. 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 2021 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- α ($p < 0.05$). Lily Lake had a statistically significant improving trend for TP, and no trend was found for average Secchi disk transparency and chl- α . Lily Lake had an average summertime TP concentration of 0.039 mg/L, which was higher than 2020 (Figure 2). Two of the nine summertime results were greater than the MPCA lake nutrient impairment standard for TP. The 2021 average summertime concentration of chl- α was 14.1 $\mu\text{g/L}$, lower than the 15.4 $\mu\text{g/L}$ measured in 2020 (Figure 3). Four of the nine water quality results for chl- α impairment exceeded the MPCA lake standard (APPENDIX A). Lily Lake had an average summertime TKN concentration of 0.88 mg/L in 2019; higher than the average of 0.76 mg/L in 2020 (Figure 4). Secchi disk readings were measured in 2021 with a summertime average of 2.40 meters (Figure 5), with three of the nine water quality readings exceeding the MPCA lake standard for Secchi disk transparency (APPENDIX A). Lily Lake received a grade of C+ in 2021, a decline from the B it received in 2020. Temperature and DO profiles indicate that Lily

¹ 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.

Lake exhibited thermal stratification during the summer months with the thermocline between 5 and 7 meters; therefore, the lake was less likely to completely mix throughout the summer. The elevation was above the OHW for the entire monitoring season, reaching its highest recorded level on 7/7/2021 with a level of 845.70 ft. The lowest recorded level of the monitoring season occurred on 4/5/2021 with an elevation of 844.86 ft. A summary of all lake results is presented in APPENDIX A.

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- α . The McKusick Lake summertime average TP concentration in 2021 was 0.039 mg/L; lower than the 0.065 mg/L observed in 2020 (Figure 2), with no water quality samples exceeding the MPCA TP impairment standard for shallow lakes (APPENDIX A). McKusick Lake had a summertime average chl- α concentration of 8.7 $\mu\text{g/L}$; higher than the chl- α average of 7.3 $\mu\text{g/L}$ from 2020 (Figure 3). One of the nine summertime samples collected in 2021 exceeded the MPCA shallow lake standard for chl- α . The average summertime TKN concentration in 2021 was 0.78 mg/L, higher than the 0.71 mg/L in 2020 (Figure 4). The 2021 summertime average water transparency measured by Secchi disk was 1.77 meters (Figure 5). Two of the nine summertime Secchi disk readings in 2021 were worse than the MPCA shallow lake impairment standard. McKusick Lake received a grade of a B- in 2021, the same as 2019-2020. No temperature and DO profiles were collected so the occurrence of thermal stratification in the deepest part of the lake cannot be determined. 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 3/29/2021 with a level of 854.35 ft. and the lowest recorded level of the season occurred on 10/12/2021 with an elevation of 853.97 ft. A summary of all lake results is presented in APPENDIX A.

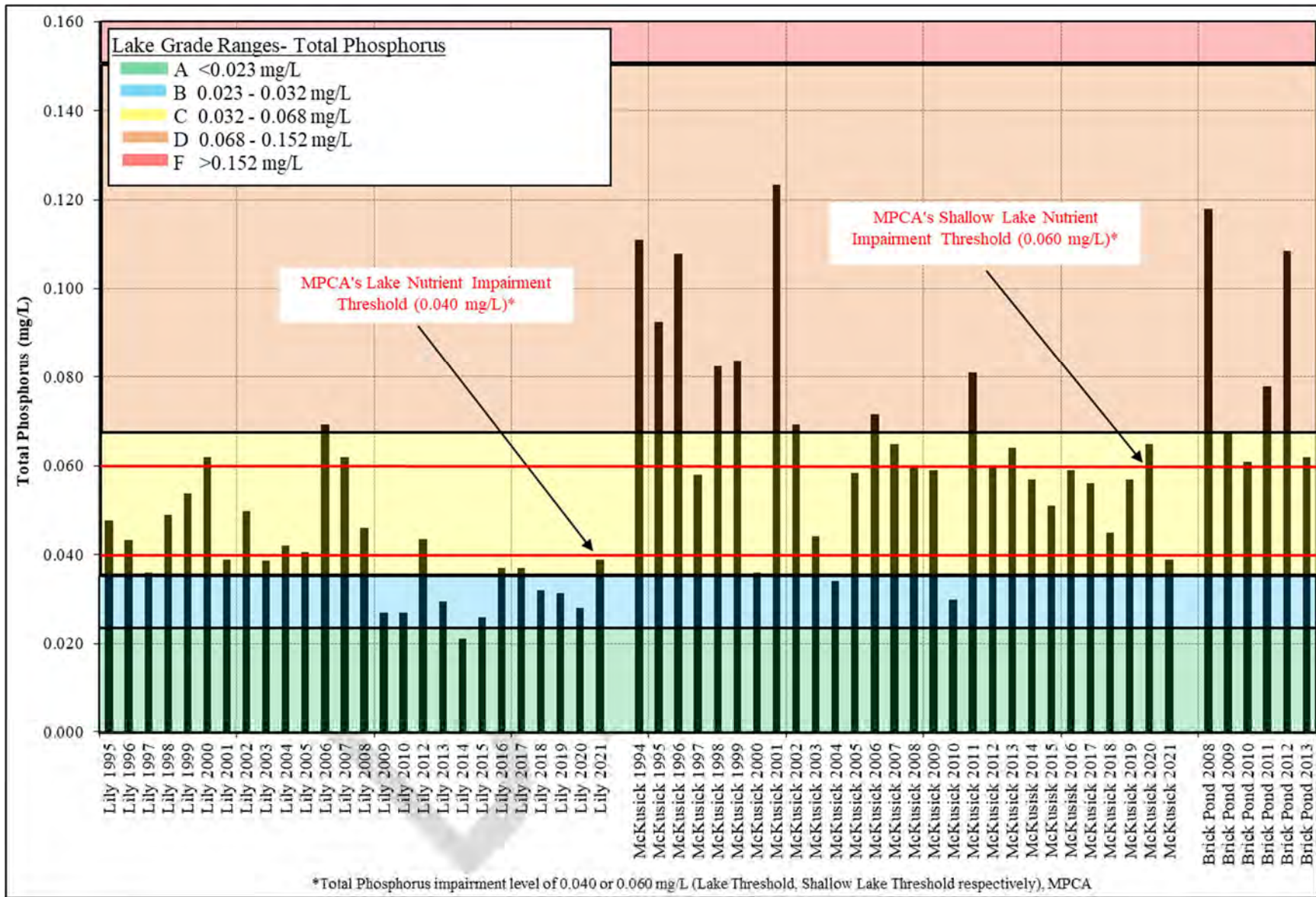


Figure 2. MSCWMO Historic Summer Average Total Phosphorus

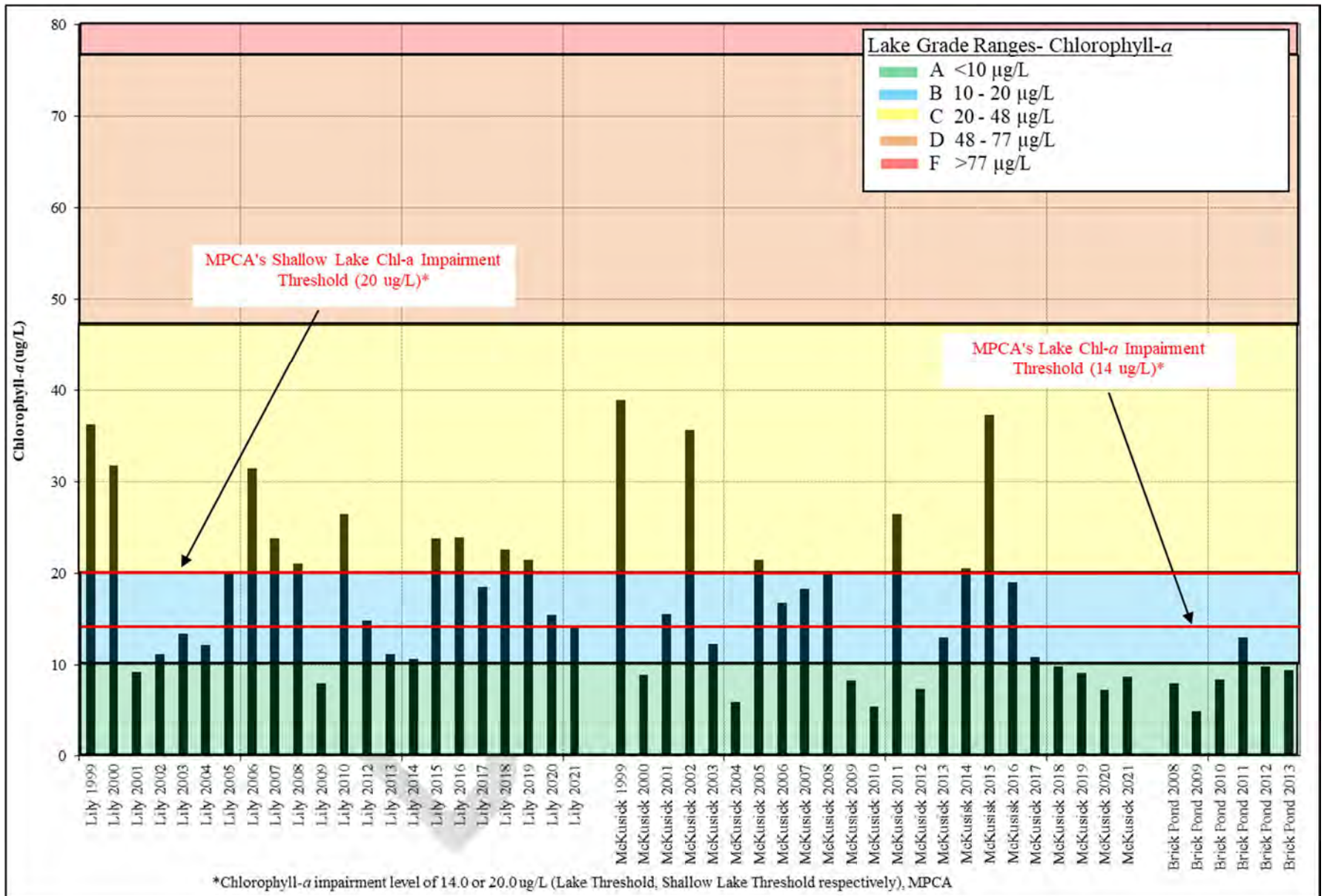


Figure 3. MSCWMO Historic Summer Average Chlorophyll-a

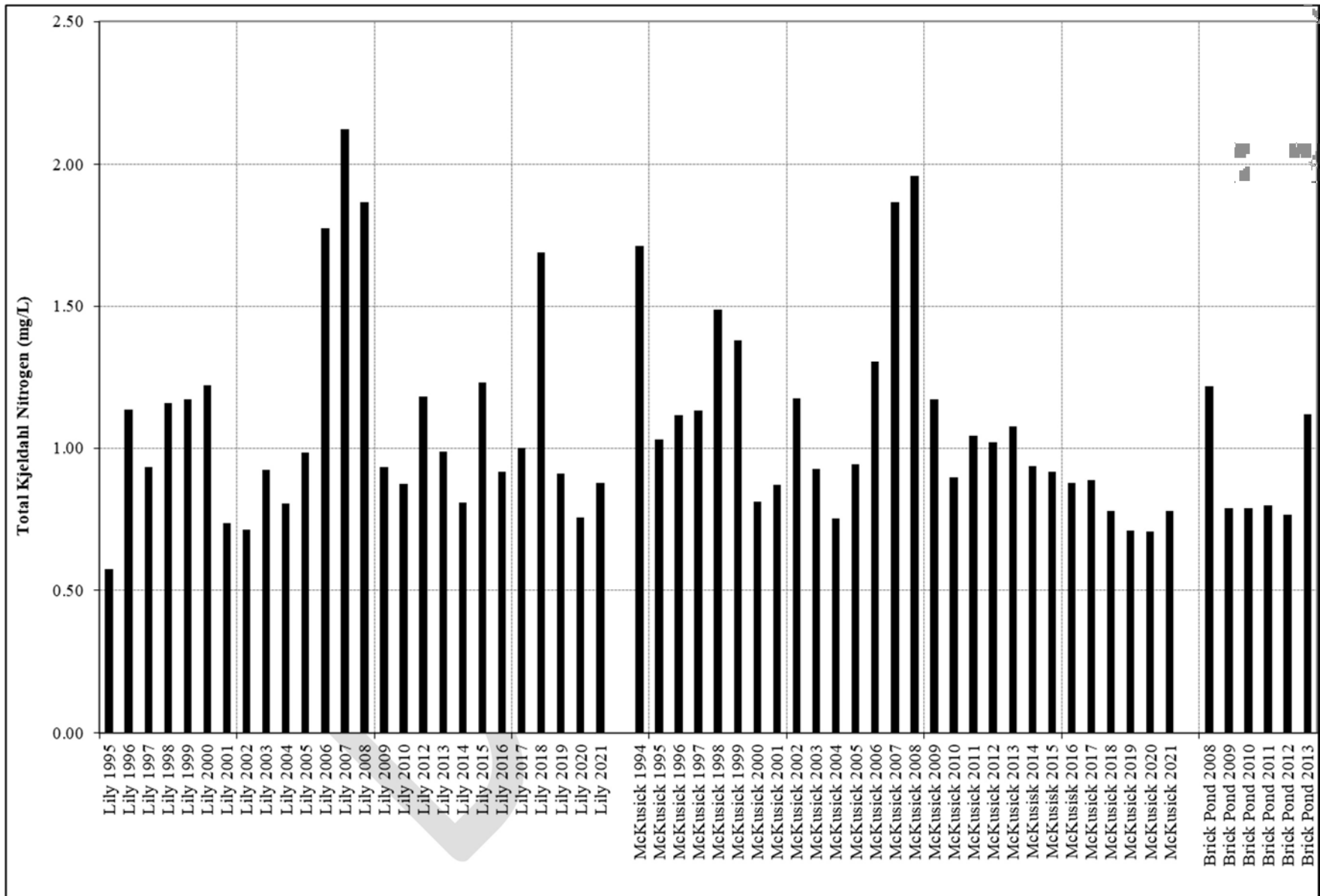


Figure 4. MSCWMO Historic Summer Average Total Kjeldahl Nitrogen

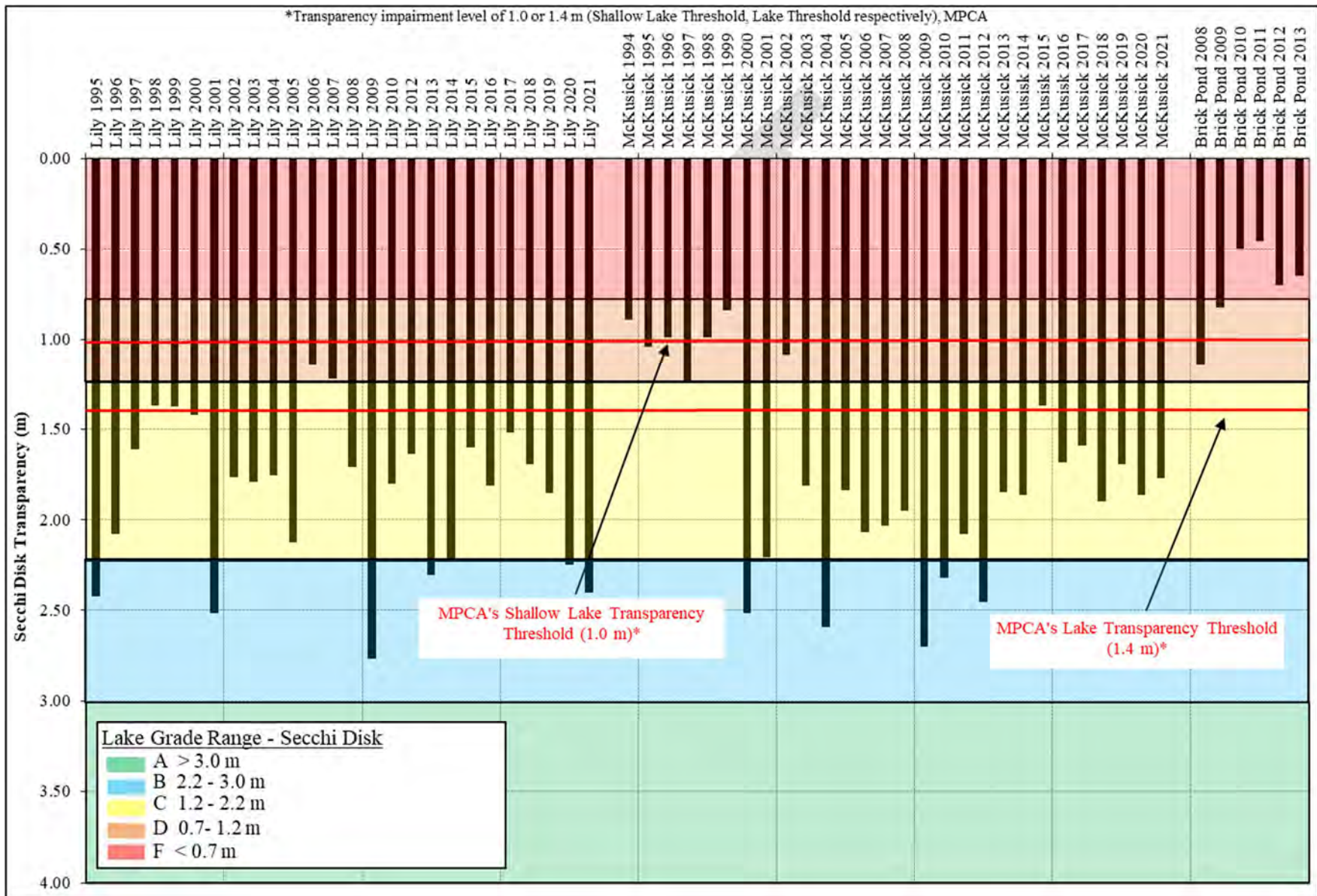


Figure 5. MSCWMO Historic Summer Average Secchi Disk Transparency

STREAM AND STORMWATER MONITORING

A. LILY LAKE INLET TARGETED 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.

As in prior years, the monitoring in 2021 focused on the Greeley Street catchment. Continuous 15-minute stage and velocity data were collected in the catchment basin from 4/21/21 – 10/26/21. Discharge was calculated using an area/velocity relationship and the recorded discharge to Lily Lake in 2021 was 4,747,103 cubic feet, which was a decrease from 2020 (Table 2, Figure 6, and Figure 7) and was due in large part to severe drought conditions. There were periods of low or no flow throughout the entire monitoring season, with an extended period in late September and October. Eight water quality grab samples were collected and analyzed for total phosphorus, total Kjeldahl nitrogen, and total suspended solids (Table 3). Similar to previous years, storm sampling in 2021 was limited by the nature of the site as storm events at the Greeley Street catchment can be flashy. Urban storm runoff is transported quickly and this makes capturing a sample more difficult during these periods.

Four water quality grab samples were collected during monthly baseflow sampling from Brick Pond (6/28, 7/26, 8/25, and 9/27) and four grab samples were collected during storm events or immediately following (5/20, 5/27, 7/6, and 8/24). All samples were collected during low flow periods (<1.0 cfs). The 6/28 baseflow sample had very high TP, TKN, and TSS concentrations. This sample contained large amounts of duckweed flowing from Brick Pond and was considered to be representative of the conditions at the time of sampling. The TP and TSS results were excluded from the baseflow averages because it was an outlier. The 7/26 and 9/27 baseflow samples had the lowest sampled concentrations for TP since sampling began in 2015. The TSS results for these two samples were also low and were within historic ranges. The 8/25 sample had higher than average TP and TKN results, but a low TSS concentration that was within

historic ranges for baseflow. The 2021 average TP during baseflow was 0.081 mg/L, which was the highest since 2015 (Table 4). The 2021 baseflow average TSS concentration was 5 mg/L, which was the highest since monitoring began in 2015, but still within the normal range for baseflow concentrations. The average TP concentration from storm samples collected in 2021 was 0.360 mg/L, which was the highest storm average since 2016 (Table 4). The average TSS concentration from storm samples was 49 mg/L, which was the highest since 2018 (518 mg/L) and similar to 2015 (48 mg/L). TP and TSS loads to Lily Lake were calculated during monitored periods, and in 2021 the TP load was 27.1 lbs (Table 2 and Figure 6) and the TSS load was 1,968 lbs (Table 2 and Figure 7).

Table 2. Greeley Street 2021 Monitored Discharge and TP & TSS Loading

| Site | Date range | Discharge (cf) | Discharge (ac-ft) | Percent of Total Discharge | TP Load (lbs) | Percent of TP Load | TSS Load (lbs) | Percent of TSS Load |
|-----------------------------------|--------------------|------------------|-------------------|----------------------------|---------------|--------------------|----------------|---------------------|
| Greeley St. Baseflow ¹ | 4/21/21 - 10/26/21 | 4,570,051 | 104.97 | 96% | 23.1 | 85% | 1426 | 72% |
| Greeley St. Stormflow | 4/21/21 - 10/26/21 | 177,052 | 4.07 | 4% | 4.0 | 15% | 542 | 28% |
| Total | | 4,747,103 | 109.04 | 100% | 27.1 | 100% | 1,968 | 100% |

¹ 6/28 results were excluded from the TP/TSS averages used for load calculations

Table 3. Greeley Street 2021 Water Quality Results

| Date | Sample Type | TP (mg/L) | TSS (mg/L) | TKN (mg/L) | Discharge (cfs) |
|---------------|---------------------|-----------|------------|------------|-----------------|
| 5/20/21 10:05 | Storm | 0.218 | 88 | 1.30 | 0.37 |
| 5/27/21 9:21 | Storm | 0.214 | 32 | 1.70 | 0.54 |
| 6/28/21 10:43 | Base ^{1,2} | 2.090 | 220 | 13.00 | 0.42 |
| 7/6/21 9:29 | Storm | 0.593 | 40 | 2.90 | 0.18 |
| 7/26/21 10:13 | Base | <0.020 | 8 | 0.92 | 0.06 |
| 8/24/21 9:03 | Storm | 0.413 | 36 | 2.00 | 0.83 |
| 8/25/21 16:01 | Base | 0.206 | 5 | 1.40 | 0.27 |
| 9/27/21 8:47 | Base | ~0.026 | ~2 | 0.61 | 0.09 |

¹ Results excluded from averages

² Sample contained duckweed flowing from Brick Pond

Table 4. Greeley Street Historical TP and TSS Averages and Ranges

| Greeley Street Sample Type | 2015 | 2016 | 2017 | 2018 ^a | 2019 ^a | 2020 ^a | 2021 |
|--------------------------------|---------------|---------------|---------------|-------------------|-------------------|-------------------|---------------|
| TP (mg/L) - Baseflow Average | 0.091 | 0.070 | 0.060 | 0.066 | 0.077 | 0.046 | 0.081 |
| Baseflow Range | 0.028 - 0.210 | 0.029 - 0.122 | 0.045 - 0.083 | 0.040 - 0.126 | 0.046 - 0.134 | 0.036 - 0.791 | <0.020 - 2.09 |
| TP (mg/L) - Stormflow Average | 0.219 | 0.437 | 0.104 | 0.316 | 0.110 | 0.199 | 0.360 |
| Stormflow Range | 0.063 - 0.382 | 0.059 - 0.744 | 0.089 - 0.119 | NA | NA | NA | 0.214 - 0.593 |
| TSS (mg/L) - Baseflow Average | 4 | 2 | 3 | 4 | 2 | 2 | 5 |
| Baseflow Range | 1 - 9 | 1 - 6 | 1 - 7 | 1 - 8 | 1 - 3 | 1 - 3 | 2 - 220 |
| TSS (mg/L) - Stormflow Average | 48 | 233 | 35 | 518 | 8 | 38 | 49 |
| Stormflow Range | 2 - 132 | 10 - 616 | 28 - 41 | NA | NA | NA | 32 - 88 |

^a Only 1 storm sample was collected for the year



Figure 6. Greeley Street Monitored Discharge and Total Phosphorus Load

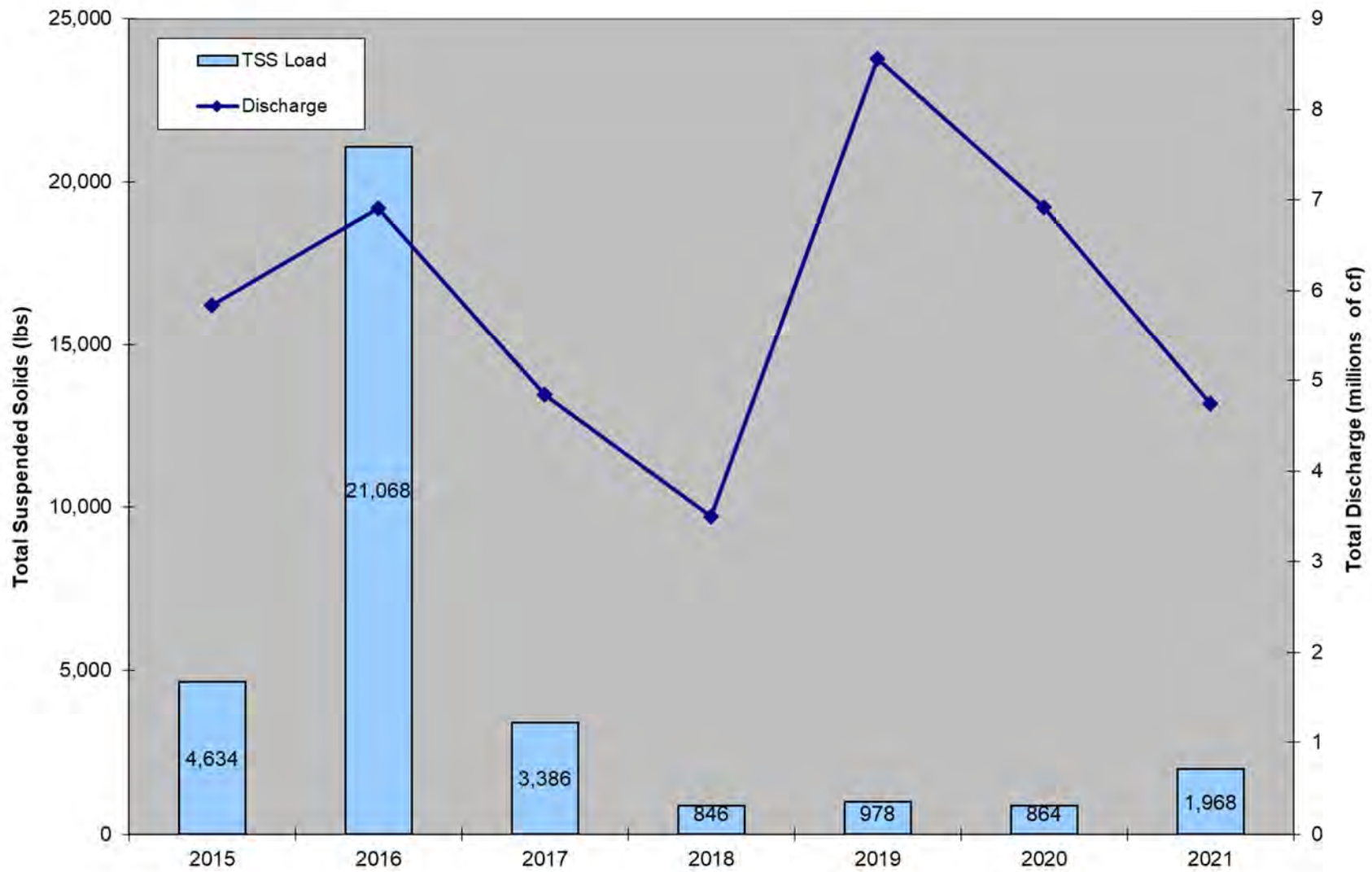


Figure 7. Greeley Street Monitored Discharge and Total Suspended Solids Load

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 St. Croix River was occurring. Monitoring continued in 2018 and 2019 to further refine previous observations. In 2020 water monitoring activities were reduced on Perro Creek and no traditional water quality samples were collected. In 2021 water quality sampling resumed at the Perro Creek at the Diversion Structure site by collecting in-stream grabs samples during baseflow periods and using an automated sampler to collect flow-weighted composite storm samples. The automated sampler allowed for multiple samples to be collected during storm events, which were then combined into one sample representing the storm event. This methodology can provide more accurate data for calculating nutrient loads during storm events than grab samples alone. Continuous 15-minute stage and velocity data were collected at the site and in the Diversion Structure Overflow from 5/3/21 – 10/25/21. Discharge was calculated using an area/velocity relationship, and the recorded discharge in 2021 to the St. Croix River was 29,891,691 cubic feet (Table 5).

Fourteen water quality samples were collected and analyzed for several parameters, including total phosphorus, total Kjeldahl nitrogen, and total suspended solids (Table 6). Five were monthly baseflow grab samples collected June – October, one was a baseflow composite sample collected in May when the Perro Pond outlet was opened for the year, and eight were composite storm samples collected June – September. The average TP concentration in 2021 during baseflow was 0.035 mg/L, which was similar to the baseflow averages in 2018 and 2019 (Table 7). A baseflow sample was collected on 6/23 that had TP and TSS results that were more than twice the average. This sample was considered an outlier and the results were excluded from the baseflow averages used for calculating loads. Also excluded were the results from the automated composite sample collected after the pond outlet was opened in May, since the sample was not an in-stream grab sample. The 2021 baseflow average TSS concentration was 2 mg/L, which was similar to the baseflow average in 2019 and less than the average in 2018. The average TP concentration from storm samples collected in 2021 was 0.427 mg/L, which was the highest storm average since 2016 (Table 7). The average TSS concentration from storm samples was 217 mg/L, which was the highest since monitoring began in 2016. TP and TSS loads to the St. Croix

River were calculated for both the creek and the diversion structure overflow during monitored periods. In 2021 the TP load was 81.5 lbs (Table 5 and Figure 8) and the TSS load was 12,601 lbs (Table 5 and Figure 9).

Perro Creek is listed as impaired for TSS on the MPCA's 303(d) Impaired Waters List. The stream is in the Central River Nutrient Region and the MPCA standard is 30 mg/L. The MPCA's protocols for assessments are as follows:

“A stream is considered to exceed the standard for TSS if 1) the standard is violated more than 10% of the days of the assessment season (April through September) as determined from a data set that gives an unbiased representation of conditions over the assessment season, and 2) at least three measurements violate the standard. A stream is considered to meet the standard for TSS if the standard is met at least 90% of the days of the assessment season. A designation of meeting the standard for TSS generally requires at least 20 suitable measurements from a data set that gives an unbiased representation of conditions over at least two different years. However, if it is determined that the data set adequately targets periods and conditions when exceedances are most likely to occur, a smaller number of measurements may suffice.”

Perro Creek is also listed as impaired for *E. coli* bacteria on the MPCA's 303(d) Impaired Waters List. *E. coli* is used as an indicator in waterbodies for the possible presence of fecal contamination, including pathogens. The primary source of *E. coli* is human and animal waste, making high *E. coli* presence a concern for human health. A summary table by month can be found in Table 8. The MPCA standard is defined as follows, and is based on the latest ten years of data as per 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 5. Perro Creek 2021 Monitored Discharge and TP & TSS Loading

| Site | Date range | Discharge (cf) | Discharge (ac-ft) | Percent of Total Discharge | TP Load (lbs) | Percent of TP Load | TSS Load (lbs) | Percent of TSS Load |
|---|-------------------|----------------|-------------------|----------------------------|---------------|--------------------|----------------|---------------------|
| Perro at Diversion Structure Baseflow ¹ | 5/3/21 - 10/25/21 | 24,657,934 | 566.36 | 82% | 53.9 | 66% | 3079 | 24% |
| Perro at Diversion Structure Stormflow | 5/3/21 - 10/25/21 | 305,612 | 7.02 | 1% | 8.1 | 10% | 4140 | 33% |
| Perro at Diversion Overflow Baseflow ^{1,2} | 5/3/21 - 10/25/21 | 4,572,966 | 105.04 | 15% | 10.0 | 12% | 571 | 5% |
| Perro at Diversion Overflow Stormflow ² | 5/3/21 - 10/25/21 | 355,179 | 8.16 | 1% | 9.5 | 12% | 4811 | 38% |
| Total to the St. Croix River | | 29,891,691 | 686.58 | 100% | 81.5 | 100% | 12,601 | 100% |

¹ 5/17 and 6/23 results were excluded from the TP/TSS averages used for load calculations

² Results averages from samples collected in-stream at the Diversion Structure were used for Diversion Overflow loading calculations

Table 6. Perro Creek at Diversion Structure 2021 Water Quality Results

| Start | End | Sample Type | TP (mg/L) | TSS (mg/L) | VSS (mg/L) | TKN (mg/L) | Ammonia Nitrogen (mg/L) | Nitrate N (mg/L) | Nitrite N (mg/L) | E. coli (mpn/100 mL) | Cadmium (ug/L) | Chromium (ug/L) | Copper (ug/L) | Lead (ug/L) | Nickel (ug/L) | Zinc (ug/L) | Hardness (mg/L CaCO3) |
|----------------|----------------|-----------------------------|-----------|------------|------------|------------|-------------------------|------------------|------------------|----------------------|----------------|-----------------|---------------|-------------|---------------|-------------|-----------------------|
| 5/17/21 14:41 | 5/17/21 17:11 | Base Composite ¹ | 0.210 | 33 | | 1.00 | 0.17 | 0.22 | <0.06 | | <0.10 | 1.3 | 4.2 | 2.3 | 1.4 | 16.7 | 176.0 |
| 6/23/21 9:15 | 6/23/21 9:15 | Base Grab ¹ | 0.078 | 19 | 9 | 0.80 | 0.09 | <0.20 | <0.06 | 172 | | | | | | | |
| 7/21/21 8:34 | 7/21/21 8:34 | Base Grab | ~0.049 | ~2 | ~1 | 0.49 | 0.07 | 0.23 | <0.06 | 119 | | | | | | | |
| 8/17/21 14:10 | 8/17/21 14:10 | Base Grab | ~0.035 | 3 | ~2 | 0.42 | <0.06 | <0.20 | <0.06 | 248 | | | | | | | |
| 9/23/21 8:55 | 9/23/21 8:55 | Base Grab | ~0.024 | ~1 | ~1 | 0.27 | <0.06 | 0.21 | <0.06 | 166 | | | | | | | |
| 10/12/21 14:40 | 10/12/21 14:40 | Base Grab | ~0.032 | ~1 | | 0.36 | <0.06 | 0.28 | <0.06 | 569 | | | | | | | |
| 6/27/21 18:13 | 6/27/21 19:57 | Storm Composite | 0.341 | 190 | | 2.20 | 0.12 | 0.33 | <0.06 | | <0.10 | 4.2 | 10.7 | 12.3 | 3.2 | 42.2 | 133.0 |
| 7/13/21 20:28 | 7/13/21 21:07 | Storm Composite | 0.862 | 429 | 100 | 5.00 | 0.83 | 0.57 | <0.06 | | 0.22 | 9.6 | 20.9 | 35.2 | 7.4 | 91.0 | 154.0 |
| 7/14/21 13:04 | 7/14/21 13:32 | Storm Composite | 0.331 | 207 | 47 | 2.80 | | 3.12 | <0.06 | | 0.11 | 4.7 | 11.8 | 19.5 | 3.8 | 47.7 | 115.0 |
| 8/5/21 23:34 | 8/5/21 23:51 | Storm Composite | 0.600 | 282 | 66 | 3.10 | | | | | 0.15 | 6.3 | 14.9 | 23.4 | 5.2 | 66.4 | 136.0 |
| 8/8/21 6:10 | 8/8/21 6:57 | Storm Composite | 0.185 | 102 | 25 | 1.30 | 0.19 | 0.26 | <0.06 | | 0.11 | 2.8 | 5.8 | 8.0 | 1.9 | 24.0 | 61.5 |
| 8/24/21 7:37 | 8/24/21 9:14 | Storm Composite | 0.283 | 75 | 24 | 1.40 | 0.13 | 0.41 | <0.06 | | <0.10 | 2.2 | 6.5 | 6.0 | 1.8 | 24.1 | 117.0 |
| 8/29/21 1:05 | 8/29/21 1:35 | Storm Composite | 0.235 | 116 | | 1.10 | 0.09 | 0.69 | <0.06 | | 0.25 | 3.0 | 6.7 | 12.8 | 2.5 | 29.9 | 71.0 |
| 9/17/21 3:44 | 9/17/21 4:02 | Storm Composite | 0.578 | 338 | 90 | 2.80 | 0.51 | 0.5 | <0.06 | | 0.20 | 6.5 | 15.3 | 24.9 | 5.1 | 66.9 | 78.7 |

¹ Results excluded from averages

Table 7. Perro Creek Historical TP and TSS Averages and Ranges

| Perro @ Diversion Sample Type | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 ^a |
|--|-------------------------|-------------------------|------------------------|------------------------|------------|------------------------|
| TP (mg/L) - Baseflow Average <i>Baseflow Range</i> | 0.051 ~0.023 - 0.090 | 0.046 <0.020 - 0.120 | 0.036 0.020 - 0.058 | 0.034 0.021 - 0.065 | No Samples | 0.035 0.024 - 0.210 |
| TP (mg/L) - Stormflow Average <i>Stormflow Range</i> | 0.435 0.126 - 1.330 | 0.108 ~0.023 - 0.218 | 0.124 0.047 - 0.252 | 0.372 0.133 - 0.597 | No Samples | 0.427 0.185 - 0.862 |
| TSS (mg/L) - Baseflow Average <i>Baseflow Range</i> | 16 <1 - 77 | 12 ~1 - 60 | 4 1 - 16 | 2 1 - 3 | No Samples | 2 1 - 33 |
| TSS (mg/L) - Stormflow Average <i>Stormflow Range</i> | 118 32 - 308 | 36 12 - 76 | 20 8 - 31 | 58 21 - 97 | No Samples | 217 75 - 429 |

^a Results from base composite sample excluded from averages (Sampled during initial opening of Perro Pond outlet)

Table 8. Monthly Geometric Means of *E. coli*- Latest Ten Years

| Site | April | May | June | July | August | September | October |
|---|--|-------------------|------|------|--------|-----------|-------------------|
| Perro at Diversion Structure ¹ | Insufficient Data | Insufficient Data | 392 | 215 | 167 | 814 | Insufficient Data |
| | Exceeds geometric mean of 126 #/100mL from not less than 5 samples in a calendar month | | | | | | |

¹ 10% of samples taken in the last 10 years exceed 1,260 #/100mL (Doesn't necessarily exceed geometric mean standard)

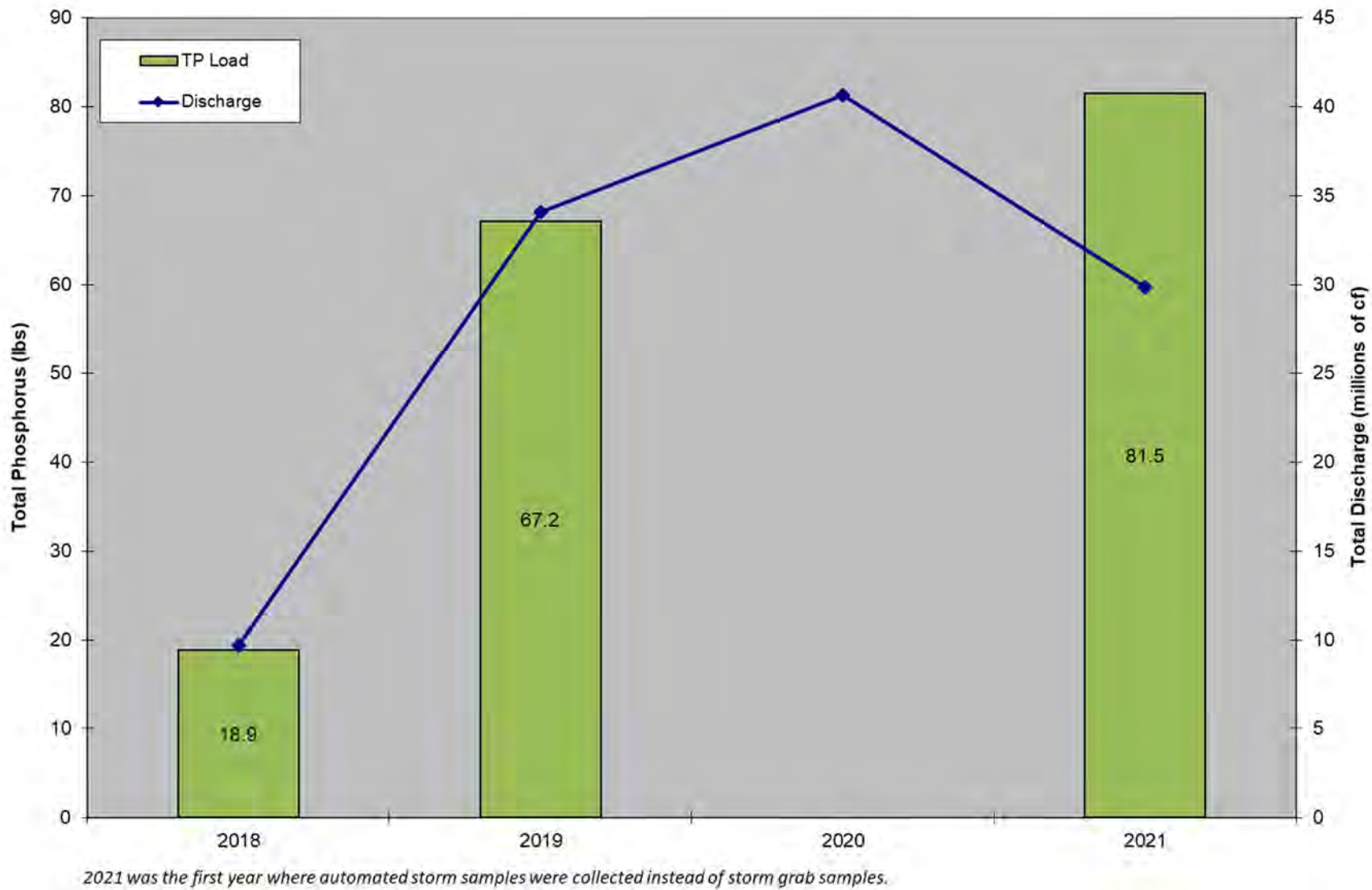


Figure 8. Perro Creek at Diversion Structure Monitored Discharge and Total Phosphorus Load

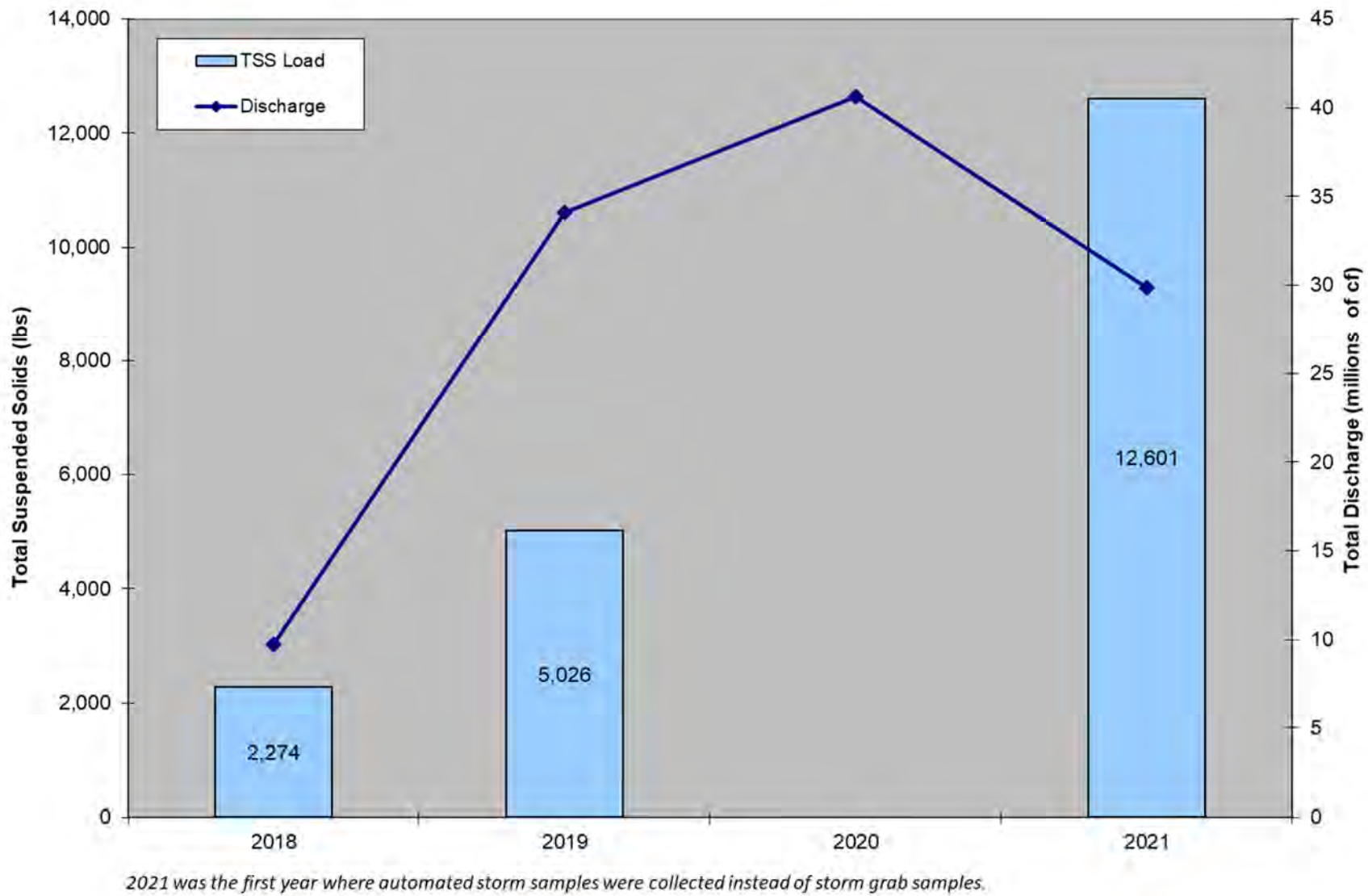


Figure 9. Perro Creek at Diversion Structure Monitored Discharge and Total Suspended Solids Load

C. 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 baseflow and storm event conditions at the Brown's Creek Diversion Structure for BCWD in 2021, 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 does 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. Discharge decreased from 2020 to 46,792,341 cubic feet exported to McKusick Lake, due to drought conditions in 2021 (Table 9). All stream flow and chemistry data from 2021 can be found in Table 9 and Table 10.

The TP load to McKusick Lake was 446 lbs., or 0.116 lbs. of phosphorus per acre of watershed land, and the TSS load was 401,069 lbs. of sediment, or 104.01 lbs. per acre (Table 9). Erosional head cuts on the tributary branches of the creek have been identified as a source of TP and TSS loads. BCWD repaired one large head cut in 2018 and additional rock vanes were installed between September and October of 2021 to reconnect the drainage tributaries with their floodplains and stabilize the stream bed. The Iron Enhanced Sand Filter (IESF) upstream of the monitoring site also continues to operate to reduce TP loads in the drainage. In early 2021 the City of Stillwater removed 1,246 cubic yards of sediment from the wetland complex at the head of McKusick Lake, in the area where the Diversion Structure drainage discharges to the lake.

There were eight exceedances of the MPCA metal standards in 2021. The calculation of metal standards is 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. There were three copper results and five lead results that exceeded the chronic standards for those parameters, and no results exceeded the maximum or FAV standards for any parameters. The number and severity of exceedances of metals standards at this site in 2021 were the fifth lowest observed since metals analysis began in 2007, likely primarily due to the dry conditions during a large portion of the year. In most cases, more severe exceedances of metals seem to be associated with extreme TSS concentrations in this drainage. Sources of metals in the drainage may include improperly disposed wastes, such as deep cycle batteries. The combination and concentration of metals observed over time appear to point to this as a possible source.

DRAFT

Table 9. Brown's Creek Diversion Historic Annual Discharge and Loading- Latest Ten Years

| | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 |
|--|------------|------------|------------|------------|------------|------------|------------|-------------|------------|------------|
| Brown's Creek Diversion Structure | | | | | | | | | | |
| Discharge (cf) | 21,810,789 | 46,435,271 | 53,519,017 | 46,276,327 | 70,780,581 | 39,625,672 | 45,453,990 | 112,468,888 | 68,165,935 | 46,792,341 |
| Total pounds of Phosphorus exported | 251 | 527 | 392 | 1,837 | 1,574 | 784 | 964 | 3,598 | 760 | 446 |
| TP (lbs/ac/yr) | 0.065 | 0.137 | 0.102 | 0.447 | 0.408 | 0.203 | 0.250 | 0.933 | 0.197 | 0.116 |
| Total pounds of TSS exported | 127,435 | 211,977 | 99,532 | 1,008,346 | 1,533,496 | 596,382 | 505,314 | 2,707,186 | 246,238 | 401,069 |
| TSS (lbs/ac/yr) | 33.06 | 54.99 | 25.82 | 261.57 | 397.79 | 154.70 | 131.08 | 702.25 | 63.87 | 104.01 |

Table 10. Brown's Creek Diversion 2021 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 | 3/8/2021 14:25 | 3/8/2021 14:25 | 79 | 24 | 1.70 | 0.348 | 0.077 | 0.00260 | 0.00240 | 0.00170 | 0.00960 | <0.00010 | 0.00200 | 34.8 | <0.06 | 0.33 | 0.16 | 107.00 |
| Storm Grab | 3/11/2021 10:56 | 3/11/2021 10:56 | 101 | 27 | 2.30 | 6.261 | ~0.029 | 0.00420 | 0.00360 | 0.00220 | 0.01610 | 0.00011 | 0.00310 | 48.6 | <0.06 | 0.27 | 0.28 | 71.10 |
| Storm Composite | 4/6/2021 23:16 | 4/7/2021 7:58 | 2,410 | 752 | 14.00 | 2.070 | ~0.047 | 0.02380 | 0.02600 | 0.01840 | 0.08990 | 0.00061 | 0.02770 | 43.2 | <0.06 | 0.47 | <0.06 | 177.00 |
| Unexplained Event Grab | 5/26/2021 8:12 | 5/26/2021 8:12 | 21 | 6 | 0.70 | 0.119 | 0.069 | 0.00094 | 0.00130 | 0.00110 | <0.00500 | <0.00010 | <0.00100 | 47.1 | <0.06 | 0.68 | <0.06 | 242.00 |
| Storm Composite | 5/27/2021 16:51 | 5/27/2021 23:26 | 2,610 | 1,060 | 0.92 | 0.150 | 0.056 | 0.02250 | 0.02680 | 0.01570 | 0.08530 | 0.00065 | 0.02290 | 41.4 | <0.06 | 0.23 | <0.06 | 233.00 |
| Storm Composite | 8/8/2021 7:47 | 8/8/2021 23:58 | 1,390 | 460 | 3.00 | 0.475 | 0.060 | 0.01930 | 0.01950 | 0.01280 | 0.08340 | 0.00052 | 0.01990 | 43.2 | <0.06 | 0.43 | <0.06 | 221.00 |
| Storm Composite | 8/26/2021 15:42 | 8/27/2021 8:05 | 631 | 209 | 3.10 | 0.517 | 0.151 | 0.00940 | 0.00920 | 0.00620 | 0.03110 | 0.00024 | 0.00970 | 40.5 | <0.06 | 0.34 | <0.06 | 138.00 |
| Base Grab | 4/22/2021 9:24 | 4/22/2021 9:24 | 7 | ~1 | 0.30 | 0.063 | ~0.044 | <0.00050 | 0.00057 | <0.00050 | <0.00500 | <0.00010 | <0.00100 | 51.1 | <0.06 | 0.54 | <0.06 | 220.00 |
| Base Grab | 6/15/2021 11:22 | 6/15/2021 11:22 | 16 | 5 | 0.70 | 0.083 | 0.060 | 0.00089 | <0.00050 | <0.00050 | <0.00500 | <0.00010 | 0.00120 | 67.6 | <0.06 | 0.39 | <0.06 | 123.00 |
| Base Grab | 7/26/2021 9:24 | 7/26/2021 9:24 | 23 | 8 | 0.44 | 0.100 | ~0.048 | 0.00098 | 0.00074 | 0.00053 | <0.00500 | <0.00010 | 0.00120 | 41.1 | <0.06 | 1.12 | <0.06 | 268.00 |
| Base Grab | 8/25/2021 9:28 | 8/25/2021 9:28 | 22 | 8 | 0.67 | 0.122 | ~0.045 | 0.00066 | 0.00096 | <0.00050 | <0.00500 | <0.00010 | <0.00100 | 58.5 | <0.06 | 0.62 | <0.06 | 260.00 |
| Base Grab | 9/23/2021 9:23 | 9/23/2021 9:23 | 3 | ~1 | 0.56 | 0.056 | ~0.033 | 0.00052 | 0.00050 | <0.00050 | <0.00500 | <0.00010 | <0.00100 | 90.1 | <0.06 | 0.27 | <0.06 | 124.00 |
| Base Grab | 10/14/2021 8:39 | 10/14/2021 8:39 | 9 | 3 | 0.39 | 0.079 | ~0.030 | <0.00100 | 0.00056 | <0.00050 | <0.00500 | <0.00010 | <0.00100 | 48.4 | <0.06 | 0.54 | <0.06 | 268.00 |

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

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 have listed both Lily and McKusick Lake on the 303(d) Impaired Waters list for nutrient/eutrophication impairment; however, McKusick Lake was delisted in 2012, and Lily Lake is scheduled to be delisted in 2022. 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 was 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.

Summertime (June-September) TP, chlorophyll- α , 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 2, Figure 3, and Figure 5). In 2001 phosphorus and chl- α levels dropped and the lake grade improved significantly. In 2006-2008, summer average TP, chl- α , and Secchi disk transparency deteriorated when compared to the averages seen from 2001 to 2005. In 2021 Lily Lake received a grade of a C+, the long-term average lake grade.

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 2018-2021 the City of Stillwater and the Lily Lake Association did not request any large-scale herbicide and algaecide treatments but individual landowner treatments have occurred. In 2010 a native buffer planting was installed at the public access and the Lily Lake watershed underwent a subwatershed assessment. 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. Construction began for a large infiltration basin in 2021, which is expected to be completed in 2022, along with an alum treatment. The effects of these BMPs may have been seen from 2012 to 2021 monitoring seasons with the 2016-2021 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 planned to be installed in the McKusick Lake watershed in 2013 but were not due to issues with utilities; instead, six larger raingardens were

installed in 2014. The impacts of previously installed raingardens may have been seen in 2017-2021 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, approximately 78% of phosphorus loading to Lily Lake occurs during storm events and the Greeley Street catchment was one of the highest contributing stormwater catchments during those events. The remaining 22% of the phosphorus load was from Brick Pond discharging to Lily Lake during baseflow conditions. Baseflow from Brick Pond accounted for 65% of the total discharge to the lake in 2016 but the average TP concentrations during those periods were lower than during storm events.

The results in 2021 support previous years' conclusions that TP and TSS concentrations from samples collected during baseflow are on average lower than concentrations during storm events. The drought conditions in 2021 caused a decrease in flow and affected baseflow and stormflow sampling. Both baseflow and stormflow average results were higher than in recent years and all samples were collected during periods with discharge < 1.0 cfs. Of the four base sample results for TP, one was considered an outlier, one was near the top end of the historic range, and two had the lowest concentrations since sampling began in 2015. Stormflow periods in 2021 accounted for only 4% of the monitored discharge to Lily Lake, but 15% of the TP load and 28% of the TSS load occurred during these periods.

Baseflow samples should continue to be collected during all flow periods to help evaluate possible changes in TP and TSS loading to Lily Lake. More storm samples should also be collected to calculate more accurate TP and TSS loadings and to better characterize storm events. Continued monitoring will also help assess the impact of potential BMPs installed in the Greeley Street catchment.

C. STREAMS

In 2021 water quality sampling resumed at the Perro Creek at the Diversion Structure site by collecting in-stream grab samples during baseflow periods and using an automated sampler to collect flow-weighted composite storm samples. The average TP and TSS concentrations from baseflow samples were similar to previous years while the stormflow averages were the highest for TSS and second highest for TP since sampling began in 2016. This is directly connected to the automated sampler collecting samples throughout entire storm events, leading to a better characterization of storm concentrations and more accurate load calculations. In 2021, stormflow periods accounted for only 2% of the monitored discharge to the St. Croix River but 22% of the TP load and 71% of the TSS load occurred during these periods. Flow-weighted composite samples should continue to be collected to more accurately calculate TP and TSS loads during storm events.

Perro Creek is listed as impaired for TSS on the MPCA's 303(d) Impaired Waters List and is assessed using an unbiased dataset. Flow-weighted composite samples are considered biased towards higher flow periods because more samples are collected during the higher flows, and these samples are therefore not used for TSS assessments. In 2021 there were no TSS results from grab samples that exceeded the MPCA standard of 30 mg/L. Water quality grab samples should continue to be collected at Perro Creek during different levels of flow to provide an unbiased dataset for assessing the stream for the TSS impairment.

Perro Creek is listed as impaired for *E. coli* bacteria on the MPCA's 303(d) Impaired Waters List. Samples collected in 2021 at the Diversion Structure in June, July, and September were less than the monthly geometric means from the last 10 years of data for that site, while the August sample was higher than the monthly geometric mean. The sample collected in October had the highest *E. coli* result in 2021 but there currently is an insufficient dataset to calculate a geometric mean for October at that site. The 10-year geometric means in June, July, August, and September exceed the MPCA standard. Monthly *E. coli* samples should continue to be collected from May through October at Perro Creek to expand the dataset for calculating monthly geometric means.

APPENDIX A
WATER QUALITY DATA – LILY LAKE AND MCKUSICK LAKE

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DRAFT

LILY LAKE

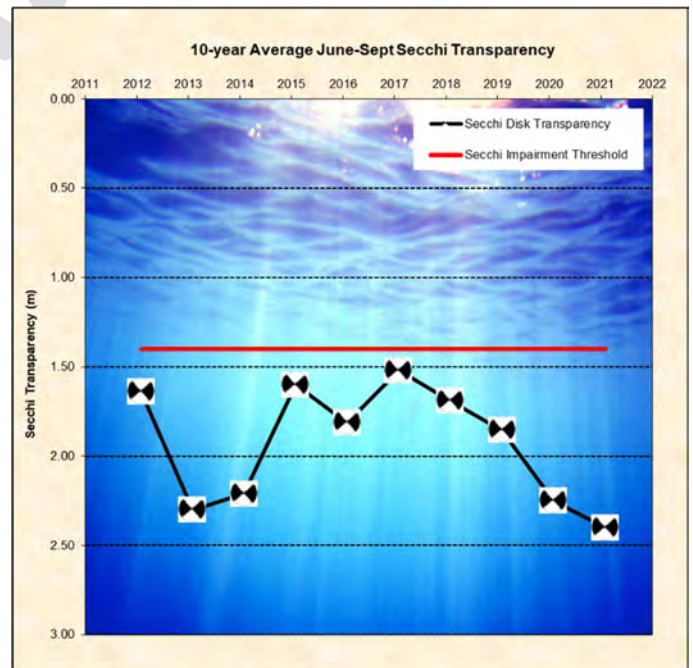
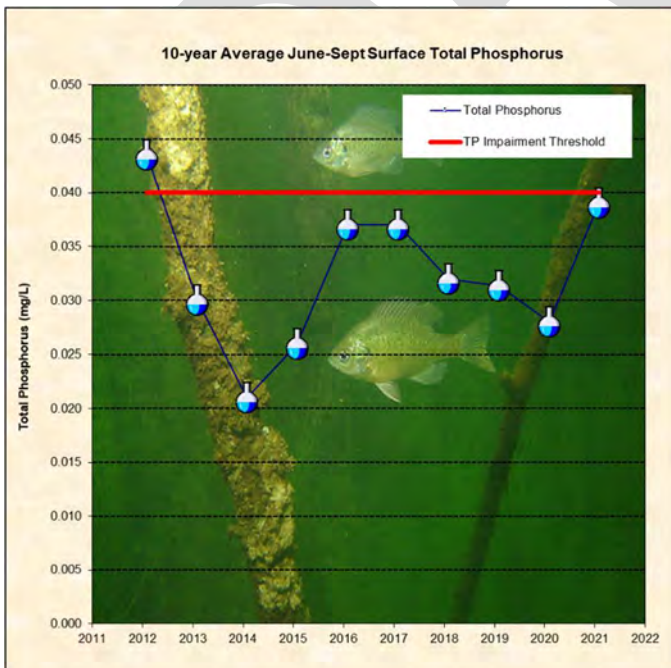
2021 Lake Grade: C+

- DNR ID #: 820023
- Municipality: City of Stillwater
- Location: NE ¼ Section 32, T30N-R20W
- Lake Size: 35.90 Acres
- Maximum Depth (2021): 47 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.
- Publicly accessible



Summary Points

- Based on the chlorophyll- α results Lily Lake was considered eutrophic in 2021, 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, and no trend is present for average Secchi transparency or average chlorophyll- α .
- The major land use is urban/residential.
- The lake stratified in 2021 with the thermocline between 5-7 meters deep.
- Lily Lake is listed as impaired for nutrients on the Minnesota Pollution Control Agency’s Impaired Waters List but is scheduled to be delisted in 2022.

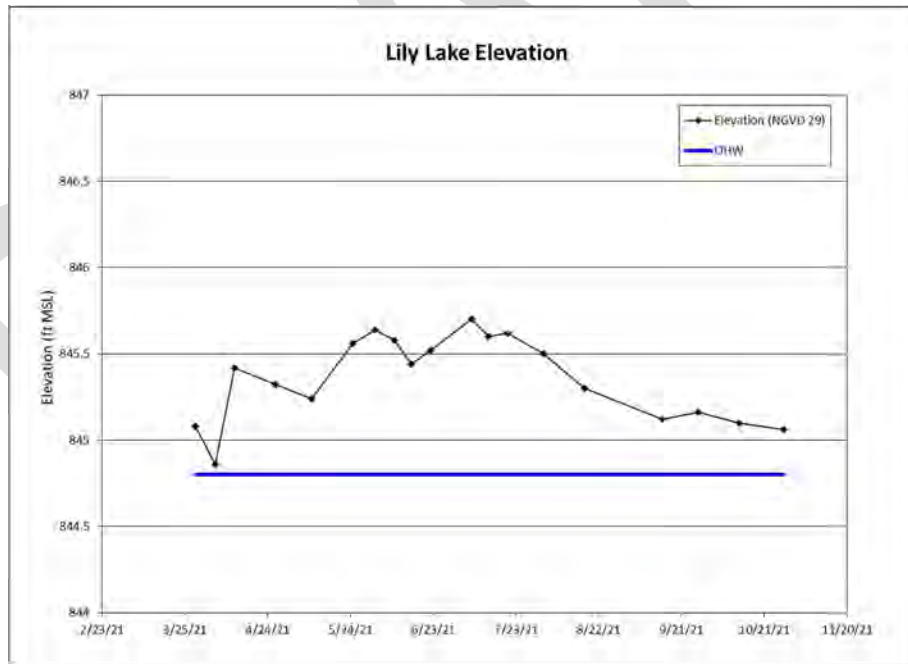


| Date/Time | Total Phosphorus (mg/L) | Uncorrected Trichromatic Chlorophyll-a (ug/L) | Pheophytin-Corrected Chlorophyll-a (ug/L) | Total Kjeldahl Nitrogen (mg/L) | Secchi Disk Depth (m) | Surface Temperature (Celsius) | Surface Dissolved Oxygen (mg/L) |
|----------------------------|-------------------------|---|---|--------------------------------|-----------------------|-------------------------------|---------------------------------|
| 4/12/2021 11:17 | 0.159 | 19.0 | 18.0 | 1.40 | 2.13 | 11.4 | 11.25 |
| 4/27/2021 7:58 | 0.025 | 23.0 | 22.0 | 0.91 | 2.74 | 9.1 | 12.16 |
| 5/10/2021 11:45 | 0.058 | 33.0 | 30.0 | 1.00 | 1.37 | 15.1 | 12.61 |
| 5/25/2021 8:36 | 0.025 | 1.1 | 1.0 | 0.76 | 3.81 | 22.9 | 7.77 |
| 6/9/2021 8:51 | 0.063 | 2.8 | 2.4 | 0.77 | 3.81 | 27.6 | 8.42 |
| 6/22/2021 8:15 | 0.032 | 4.7 | 4.3 | 0.73 | 4.27 | 22.1 | 7.64 |
| 7/7/2021 8:49 | 0.054 | 8.3 | 7.2 | 0.69 | 3.05 | 25.9 | 6.39 |
| 7/20/2021 7:56 | 0.027 | 6.0 | 5.3 | 0.75 | 2.59 | 26.6 | 8.41 |
| 8/2/2021 10:39 | 0.040 | 37.0 | 36.0 | 1.30 | 0.91 | 25.4 | 7.65 |
| 8/17/2021 7:58 | 0.040 | 23.0 | 22.0 | 0.97 | 1.22 | 24.3 | 7.88 |
| 8/30/2021 9:41 | 0.039 | 26.0 | 24.0 | 0.95 | 1.07 | 23.9 | 7.36 |
| 9/14/2021 10:50 | 0.025 | 11.0 | 10.0 | 0.82 | 2.90 | 21.1 | 7.63 |
| 9/27/2021 8:30 | 0.032 | 17.0 | 16.0 | 0.96 | 1.83 | 18.4 | 9.11 |
| 10/12/2021 8:12 | 0.033 | 14.0 | 13.0 | 0.82 | 2.29 | 19.0 | 8.10 |
| 2021 Average | 0.047 | 16.1 | 15.1 | 0.92 | 2.43 | 20.9 | 8.74 |
| 2021 Summer Average | 0.039 | 15.1 | 14.1 | 0.88 | 2.40 | 23.9 | 7.83 |

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 |
|----------------------------|--------|-----------|--------|----------|---------|
| 2021 Elevation (ft) | 845.70 | 7/7/2021 | 844.86 | 4/5/2021 | 845.36 |

*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) | | | | | | | | | |
| | 2021 | 2020 | 2019 | 2018 | 2017 | 2016 | 2015 | 2014 | 2013 | 2012 |
| Total Phosphorus (mg/L) | C | B | B | B | C | C | B | A | B | C |
| Chlorophyll-a (ug/L) | C | B | B | B | B | C | C | B | B | B |
| Secchi depth (ft) | B | B | C | C | C | B | C | B | B | C |
| Overall | C+ | B | B- | B- | C+ | C+ | C+ | B+ | B | C+ |

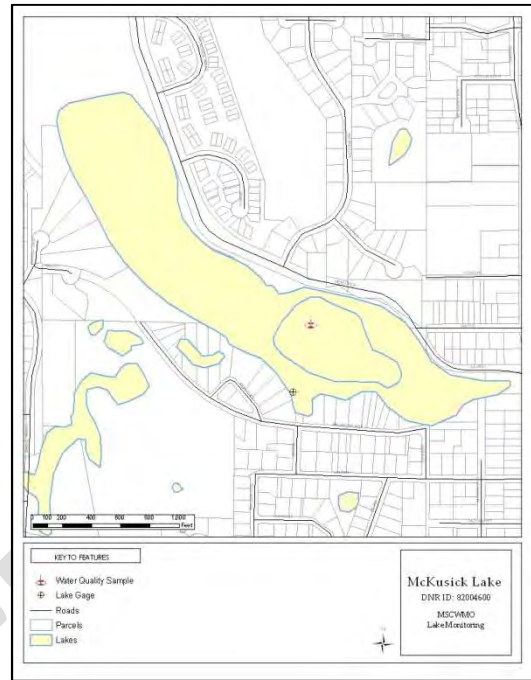
MCKUSICK LAKE

2021 Lake Grade: B-

DNR ID #: 820020

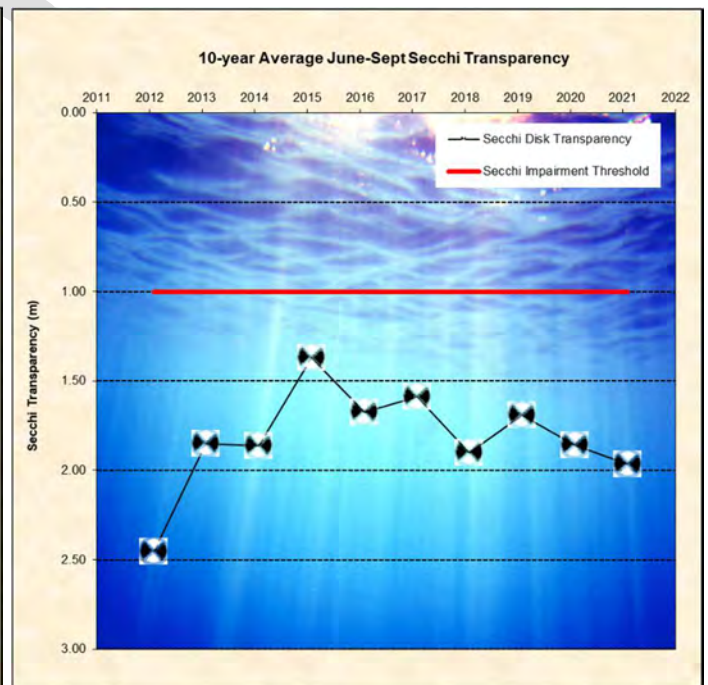
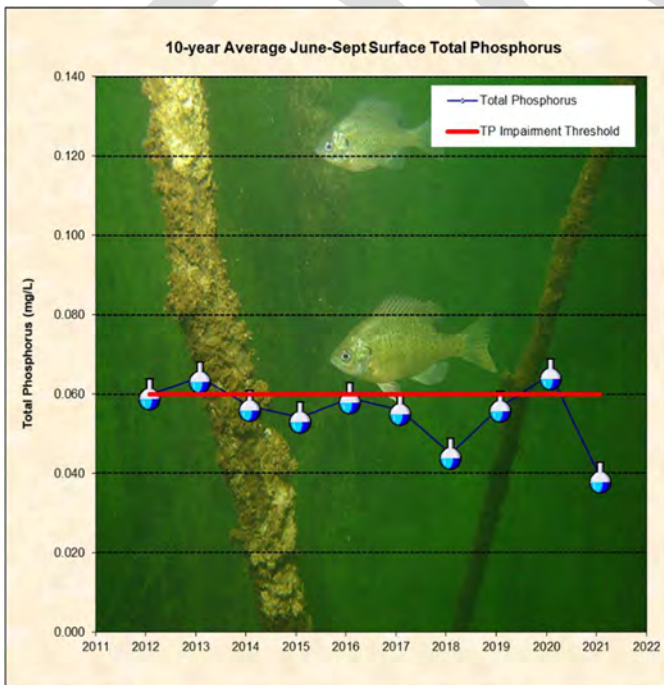
- Municipality: City of Stillwater
- Location: NE ¼ Section 29, T30N-R20W
- Lake Size: 46 Acres
- Maximum Depth (2021): 15 ft
- Ordinary High Water Mark: 851.7 ft
- 100% Littoral

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



Summary Points

- Based on the chlorophyll- α results McKusick Lake was considered eutrophic in 2021, 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- α .
- The major land use is urban/residential.
- Temperature and dissolved oxygen profiles were not collected in 2021 so stratification cannot be determined.
- McKusick Lake was delisted in 2012 for its impairment for nutrients on the Minnesota Pollution Control Agency's Impaired Waters List.

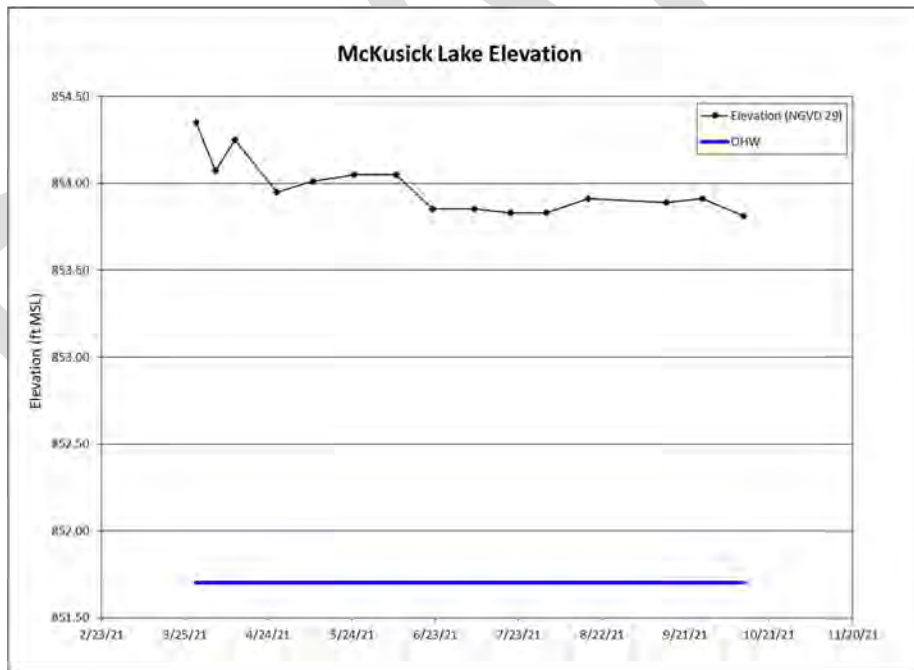


| Date/Time | Total Phosphorus (mg/L) | Uncorrected Trichromatic Chlorophyll-a (ug/L) | Pheophytin-Corrected Chlorophyll-a (ug/L) | Total Kjeldahl Nitrogen (mg/L) | Secchi Disk Depth (m) | Surface Temperature (Celsius) | Surface Dissolved Oxygen (mg/L) |
|----------------------------|-------------------------|---|---|--------------------------------|-----------------------|-------------------------------|---------------------------------|
| 4/12/2021 12:03 | 0.062 | 20.0 | 17.0 | 0.69 | 1.37 | 11.3 | 8.84 |
| 4/27/2021 8:20 | 0.052 | 17.0 | 15.0 | 0.84 | 1.22 | 8.9 | 10.65 |
| 5/10/2021 12:14 | 0.033 | 8.0 | 6.1 | 0.78 | 1.52 | 15.4 | 9.71 |
| 5/25/2021 9:06 | 0.037 | 4.7 | 3.7 | 0.70 | 2.44 | 23.3 | 8.72 |
| 6/9/2021 9:17 | 0.030 | 3.1 | 2.9 | 0.71 | 3.51 | 27.9 | 9.42 |
| 6/22/2021 8:54 | 0.045 | 10.0 | 9.6 | 0.73 | 1.98 | 21.9 | 5.30 |
| 7/7/2021 9:14 | 0.048 | 11.0 | 9.1 | 0.75 | 0.76 | 24.6 | 2.99 |
| 7/20/2021 8:22 | 0.040 | 4.3 | 4.0 | 0.81 | 1.83 | 25.0 | 3.28 |
| 8/2/2021 9:46 | 0.037 | 6.0 | 5.1 | 0.78 | 0.61 | 24.1 | 1.25 |
| 8/17/2021 8:24 | 0.028 | 4.7 | 3.2 | 0.68 | 2.29 | 23.4 | 5.52 |
| 8/30/2021 9:15 | 0.057 | 26.0 | 22.0 | 0.86 | 1.98 | 22.8 | 6.33 |
| 9/14/2021 11:18 | 0.029 | 11.0 | 10.0 | 0.72 | 2.59 | 19.8 | 5.72 |
| 9/27/2021 9:05 | 0.037 | 7.0 | 6.4 | 0.88 | 2.13 | 17.0 | 8.02 |
| 10/12/2021 8:39 | 0.031 | 5.9 | 4.8 | 0.73 | 1.98 | 18.3 | 5.97 |
| 2021 Average | 0.040 | 9.9 | 8.5 | 0.76 | 1.87 | 20.3 | 6.55 |
| 2021 Summer Average | 0.039 | 9.2 | 8.0 | 0.77 | 1.96 | 22.9 | 5.31 |

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 |
|----------------------------|--------|-----------|--------|------------|---------|
| 2021 Elevation (ft) | 854.35 | 3/29/2021 | 853.81 | 10/12/2021 | 853.97 |

*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) | | | | | | | | | |
| | 2021 | 2020 | 2019 | 2018 | 2017 | 2016 | 2015 | 2014 | 2013 | 2012 |
| Total Phosphorus (mg/L) | C | C | C | C | C | C | C | C | C | C |
| Chlorophyll-a (ug/L) | A | A | A | B | B | B | C | C | B | A |
| Secchi depth (ft) | C | C | C | C | C | C | C | C | C | B |
| Overall | B- | B- | B- | C+ | C+ | C+ | C | C | C+ | B |

**CLEAN WATER GRANT FUND WORK ORDER BETWEEN
Middle St. Croix Watershed Management Organization
AND CONSERVATION CORPS**

Project Number: 220-11154

This work order is between the Project Host, Middle St. Croix Watershed Management Organization ("Project Host") and CONSERVATION CORPS ("The Corps"). This work order is issued under the authority of the Minnesota Session Laws 2021, 1st Special Session, Chapter 2, Article 2, Section (s) which requires the Board to contract with the Conservation Corps for restoration, maintenance, and other activities, for up to \$750,000 in FY22, and is subject to all provisions of the Board of Water and Soil Resources Clean Water Grant Fund Contract No 131838, which is incorporated by reference.

1. TERM OF WORK ORDER

- 1.1 **Effective date:** 05/02/2022, or the date the Corps obtains all required signatures under, whichever is later.
- 1.2 **Expiration date:** 12/31/2022, or until all obligations have been satisfactorily fulfilled, whichever occurs first.

2. DUTIES OF THE CORPS

- 2.1 Complete services as specified in Clean Water Fund Project Request Form, which is attached hereto, and shall be a part of this work order.
- 2.2 Enroll and supervise AmeriCorps members in accordance with program guidelines.
- 2.3 Provide basic orientation and training as appropriate for corpsmembers.
- 2.4 Provide consultation and on-site project review to ensure that service is progressing in accordance with this work order and program guidelines.
- 2.5 Provide personnel and payroll administration for corpsmembers.
- 2.6 Provide all necessary transportation of corpsmembers to and from service sites.
- 2.7 Provide basic tools, safety gear, personal supplies and equipment needed by corpsmembers to meet all PROJECT HOST and federal safety requirements. Provide professional liability and worker's compensation insurance for all corpsmembers.
- 2.8 Track services completed and make this information available to PROJECT HOST upon request.
- 2.9 Report financial information on the use of state funds, and outcome and match information in eLINK using information provided by the PROJECT HOST.

3. DUTIES OF PROJECT HOST

- 3.1 Provide project specific direction and assistance to the corpsmember(s).
- 3.2 Maintain records of and provide any requested project information for purposes of grant reporting consistent with Sections 3.6 and 7 of the FY22 Clean Water Fund Policy (available on the BWSR website - <http://bwsr.state.mn.us/grant-program-policies>)
 - 3.2.1 This includes any records of match, direct expenses, pollution reduction estimates, or other project data which may be completed or collected by a third-party project partner.
- 3.3 Provide at least one media promotion to the public stating that the services(s) are being performed by the Corps. Any publicity regarding the subject matter of this work order must not be released without prior approval from the Corps' Authorized Representative.
- 3.4 Ensure safe working conditions in and around project areas that meet all state and federal standards.
- 3.5 Secure all local, county, and federal permits required by law prior to the commencement of work.
- 3.6 Provide Conservation Corps Crew with training and educational opportunities relevant to the services being performed. This includes an on-site project overview at the outset of the project which outlines project background, goals and overall outcomes expected as a result of the crew efforts.
- 3.7 Provide specialized tools, safety gear, personal supplies and equipment that are not available through the Corps that is needed by corpsmembers to meet all state and federal safety requirements.
- 3.8 Assist in the acquisition of camping/lodging accommodations if necessary.
- 3.9 Provide all project materials, supplies and chemicals.

4. CONSIDERATIONS AND PAYMENT

- 4.1 The Corps will pay for services performed, utilizing its Clean Water Grant Fund accounts. Expenditures from these accounts shall be expended only for the purposes for which they were approved and intended.
- 4.2 Materials (chemicals, lumber, hardware, plant material, etc.) shall be provided by the PROJECT HOST at the expense of the PROJECT HOST.

5. PROJECT MANAGERS

The PROJECT HOST's Project Manager is Matthew Downing, Administrator, , , , or their successor. The PROJECT HOST's Project Manager will certify acceptance on each invoice submitted for payment. If the PROJECT HOST's Project Manager changes at any time during this work order, the PROJECT HOST must immediately notify the Corps.

The Corps' Project Manager is Dorian Hasselmann, District Manager, 60 Plato Blvd E, Suite 210, Saint Paul, MN 55107, or their successor. If the Project Manager changes at any time during this work order, the Corps must immediately notify the PROJECT HOST.

6. DUPLICATION, DISPLACEMENT, SUPPLANTATION

- 6.1 Conservation Corps crews are subject to the provisions of 42 U.S.C. §§ 12501 - 12682 and 45 C.F.R. parts 2500 - 2550. These laws require, in part, that AmeriCorps assistance be used only for a program that:
 - 6.1.1 Does not duplicate, and is in addition to, an activity otherwise available in the locality of the program;
 - 6.1.2 Will not displace an employee or position, including partial displacement such as reduction in hours, wages, or employment benefits; and
 - 6.1.3 Will not create a service opportunity that will infringe on the promotional opportunity of an employee.
- 6.2 An AmeriCorps/Conservation Corps member shall not perform services or duties or engage in activities that:
 - 6.2.1 Would otherwise be performed by an employee as part of the employee's assigned duties.
 - 6.2.2 Will supplant the hiring of employed workers.
 - 6.2.3 Are services or duties with respect to which an individual has recall rights pursuant to a collective bargaining agreement or applicable personnel procedures.
 - 6.2.4 Have been performed by or were assigned to any presently employed worker; an employee who recently resigned or was discharged; an employee who is on leave, on strike, being locked out, subject to a reduction in force, or has recall rights subject to a collective bargaining agreement or applicable personnel procedure.

7. CANCELLATION

- 7.1 This work order may be cancelled by the PROJECT HOST or the Corps at any time, with or without cause, upon 30 days written notice to the other party. In the event of such cancellation, the Corps shall expend dedicated funds for services performed up to date of cancellation.
- 7.2 The Corps reserves the right to withdraw corpsmembers from PROJECT HOST for emergency response work including, but not limited to, natural disasters and wildfire response. THE CORPS will make reasonable efforts to accommodate the needs of the PROJECT HOST to ensure rescheduling.

**CONSERVATION CORPS PROJECT MANAGER PROJECT HOST AUTHORIZED
REPRESENTATIVE**

| | |
|-------------------------|----------------------|
| By: | By: |
| Title: District Manager | Title: Administrator |
| Date: | Date: |

The CORPS and the PROJECT HOST have entered into an agreement to complete the project per the scope of work as derived from the originally submitted project request from:

Contact & Agency Information

1. Project Contact Name: Matthew Downing
2. Project Contact Title: Administrator
3. Agency: Middle St. Croix Watershed Management Organization
4. Phone Number: 1651330822022
5. Email Address: mdowning@mnwcd.org

Project Location Information & Description

1. Project Name: Lake St. Croix Floodplain and Shoreline Buffer Restoration
2. Project Location: Bayport, Lake St. Croix Beach, Saint Mary's Point
3. If applicable, project address: , , MN
4. Project Purpose: The MSCWMO will partner with local municipalities and landowners to restore riparian buffer and habitat along the St. Croix River and Perro Creek. Public property on the bluff area of the river is a prime location to show the value of natural shoreline for long term stability, water quality and ecosystem benefits. The goals of the projects are to stabilize shoreline/bluff without the need for heavily engineer solutions as well as provide increased habitat to riparian species.
5. Project Explanation: Crew will be responsible for brush cutting and clearing, invasive species removal and herbicide application early in the year. Mid summer site prep will occur and a second round of woody removal. Planting of native perennials, shrubs and trees will occur in the fall.

BMP To Be Installed & Priority Level

1. Streambank and shoreline protection, HIGH - New installation or establishment of BMPs
2. Riparian herbaceous cover, HIGH - New installation or establishment of BMPs
3. Restoration and management of declining habitat, HIGH - New installation or establishment of BMPs

Pollution Reduction Estimate

| Pollutant | Amount | Estimation Method |
|---------------------------------------|--------|---|
| Sediment - TSS (tons/yr) | 12.76 | BWSR Estimator (stream and ditch stabilization) |
| Phosphorous - est. reduction (lbs/yr) | 10.85 | BWSR Estimator (stream and ditch stabilization) |
| Bacteria - Estimate | 5% | Other |
| | | |

Project Coordination & Scheduling

1. Detailed description and purpose of project, including desired outcomes:
 The MSCWMO will partner with local municipalities and landowners to restore riparian buffer and habitat along the St. Croix River and Perro Creek. Public property on the bluff area of the river is a prime location to show the value of natural shoreline for long term stability, water quality and ecosystem benefits. The goals of the projects are to stabilize shoreline/bluff without the need for heavily engineer solutions as well as provide increased habitat to riparian species.
2. Educational value and/or on-site education provided to crew: the crew will learn how to identify invasive species, become aware of the dynamic environment present in a major river floodplain and interact with the public on a highly visible project location.
3. Estimated Crew Time Required: 12
4. Preferred Season/Dates: Late March/June/September
5. Description of crew responsibilities and tasks to be carried out Crew will be responsible for brush cutting and clearing, invasive species removal and herbicide application early in the year. Mid summer site prep will occur and a second round of woody removal. Planting of native perennials, shrubs and trees will occur in the fall.
6. List hand tools needed for the project: Shovels, rakes, pruning shears
7. List power tools needed for the project: Chainsaws, string trimmers, brush saws.

Community Planning Information

1. Is all permitting, contracting, and landowner consent completed? Yes
 - a. If not, what is still required that may cause delay or cancellation of this project?
2. Has a TMDL implementation plan, watershed management plan, county comprehensive local water management plan, local surface water management plan, metro groundwater plan, surface water intake plan or well head protection plan been approved and locally adopted? Please explain: Yes, the areas in question are covered under a number of such plans. Lake St. Croix has been identified as a priority under the 2015 MSCWMO WMP for restoration and protection and is referenced as the primary driver of these actions.

3. How will this project ensure practices implemented will be of a long-lasting public benefit with a minimum 10 years effective life? All of the practices are being implemented on public property owned by the local municipality. MSCWMO and the communities partner on a shared maintenance program that will add these practices to the rotation that are under our care.
4. Local financial contribution – itemized description and amount:
MSCWMO Cost Share will be used for purchase of plants and materials (up to \$3k), MSCWMO and City Staff time will be utilized for project oversight and additional site prep outside the scope of work requested under this application.

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: Brett Stolpestad, Landscape Restoration Technician, Washington Conservation District
DATE: May 12, 2022

RE: LSC Direct South Phase II – Riviera Avenue Basins

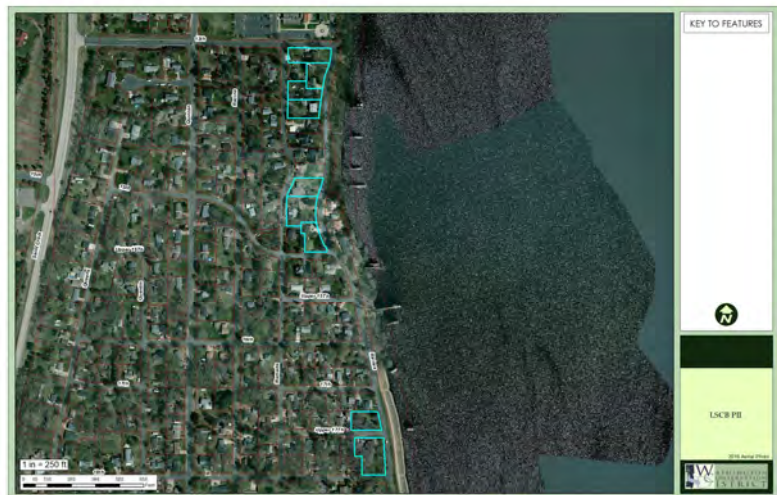
The MSCWMO, City of Lake St. Croix Beach, and residents along Riviera Avenue South are entering into an agreement to construct a series of planted and turfed bioinfiltration basins and swales along the west side of Riviera, opposite the bluff and river. This project will include a total of seven bioinfiltration practices on six parcels, three of which will be constructed entirely within the city right of way. Together, the practices will treat 7.8 acres of residential drainage that is currently discharging directly to Lake St. Croix.

The series of proposed basins and swales will reduce total phosphorus (TP) loading to Lake St. Croix by at least 7.3 pounds per year based on 2022 WinSLAMM modeling.

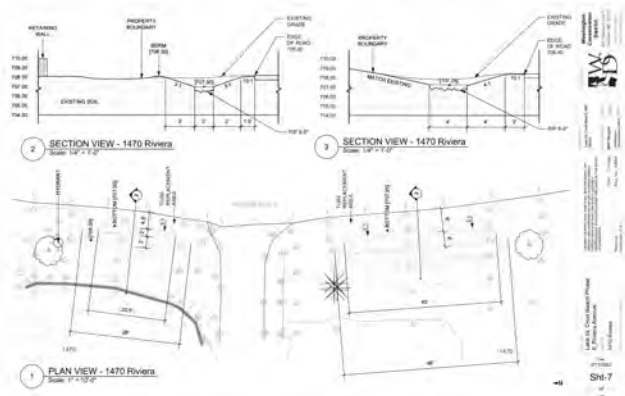
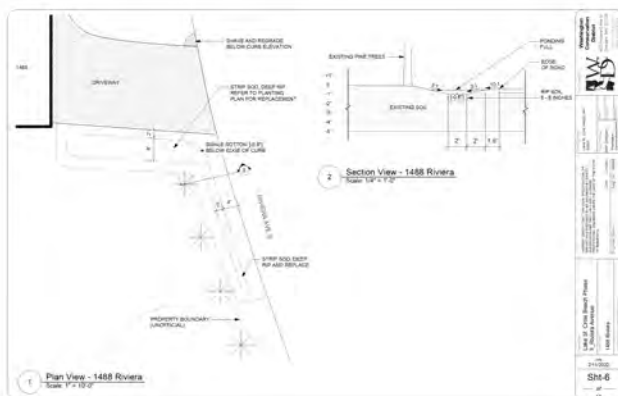
Requested Board Action:

Motion by Board Member 1, seconded by Board Member 2, to approve RFQ and construction bidding procedures.

Motion by Board Member 1, seconded by Board Member 2, to approve agreements with City of Lake St. Croix Beach and individual landowners.



Location & Photos:





May 4, 2022

Matt Downing - Administrator
Middle St. Croix WMO
455 Hayward Ave
Oakdale, MN 55128

Re: Additional Fee for Lily Lake Alum Treatment

Dear Matt:

Since our original quotation in July of 2020 for the alum treatment for Lily Lake, costs, particularly in trucking, have increased dramatically. The original quote was \$124,109.00 and the contractor has requested an additional \$11,964.00 to offset these unforeseen price increases. Our contractor, HAB Aquatic Solutions was recently acquired by SOLitude Lake Management. In spite of this change, they have not increased their mobilization and installation costs. We are planning on completing the alum treatment on May 18th – 20th.

| | |
|---|---------------------|
| Original Contract including EOR services | \$134,784.00 |
| Additional materials and transportation cost request | \$11,964.00 |
| Revised Project Cost | \$146,748.00 |

Thank you very much for the opportunity to offer our services. Please sign and return this document to me.

Sincerely,

A handwritten signature in black ink that reads "Jay Michels". The signature is written in a cursive style.

Jay Michels, Project Manager

Cc: Britta Hansen, Kyle Crawford (EOR)

SIGNATURES

Emmons & Olivier Resources, Inc

Client _____
Client Name

By _____
Signature

By _____
Signature

Printed Name

Printed Name

Its _____
Title

Its _____
Title

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: Matt Downing, Administrator
DATE: May 2nd, 2022

RE: 6f.) St. Croix Valley Regional Trail TAC Membership Request

Washington County is launching a master planning process for the future Middle St Croix Valley Regional Trail. This will be a north-south multiuse trail that will run through eastern Washington County from Downtown Afton to the St. Croix Boom Site in Stillwater. Once fully developed, it will feature vital connections to other state, regional, county and city trails, as well as parks, schools, and businesses in the St. Croix River Valley.

The County is putting together a technical advisory committee (TAC) of key stakeholders along the corridor and would like to have a representative from the Watershed District. They have requested that I attend roughly 4 meetings over a 9-month study period to provide WMO input on the process.

Recommended Board Action- Appoint the Administrator as the WMO Representative to the St. Croix Valley Regional Trail TAC.



MEMORANDUM

TO: Middle St. Croix WMO Board of Managers
FROM: Brett Stolpestad, Landscape Restoration Technician, Washington Conservation District
DATE: May 12, 2022

RE: 820 Rainbow Ct.,
Stillwater, MN 55082

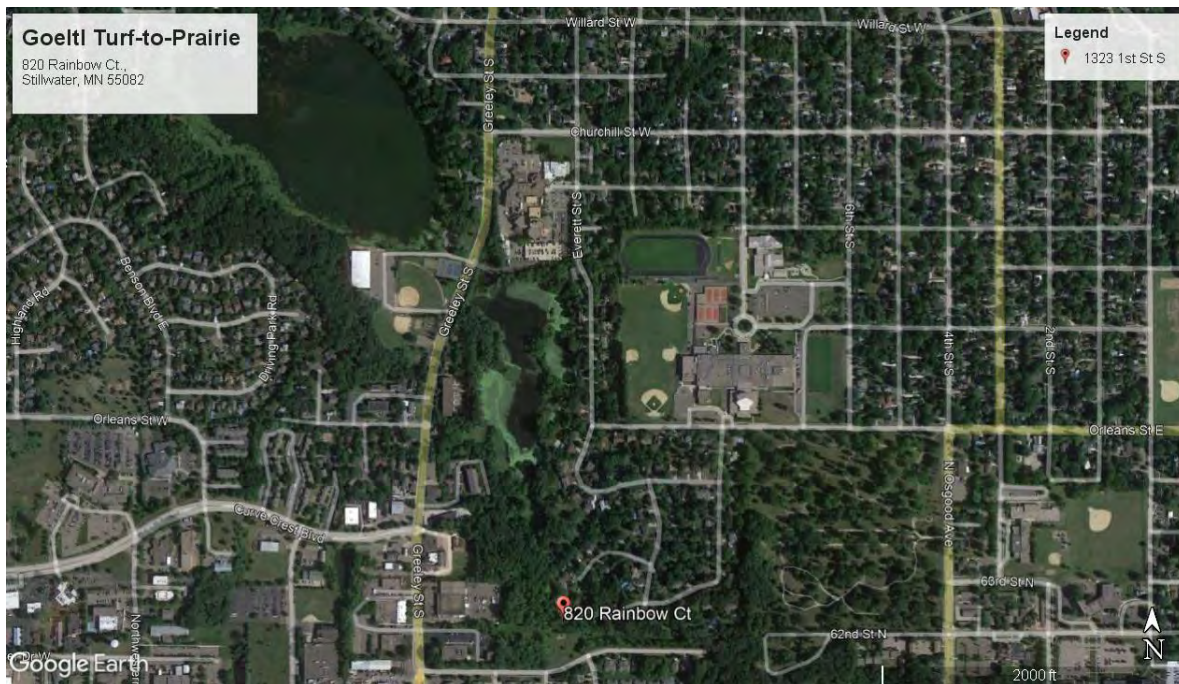
The Goeltl's are applying for a Native Habitat Restoration grant. They would like to convert their existing Kentucky bluegrass lawn to a 5,000 sq. ft. native prairie. Their property is located less than a quarter mile from Brick Pond in Priority Catchment Lily-22 as identified in the Lily Lake Stormwater Retrofit Assessment, making it an ideal location for a water quality and habitat improvement project.

Project Estimate: \$8,241.00 (or refer to Landbridge itemized bid sheet)
Amount of Phosphorus Removed: n/a
Cost Share Requested: \$1,000.00

Requested Board Action:

Motion by Board Member 1, seconded by Board Member 2, to approve encumbrance of \$1,000.00 cost share for the installation of the Goeltl turf-to-prairie conversion.

Location & Photos:







MEMORANDUM

TO: Middle St. Croix WMO Board of Managers
FROM: Brett Stolpestad, Landscape Restoration Technician, Washington Conservation District
DATE: May 12, 2022

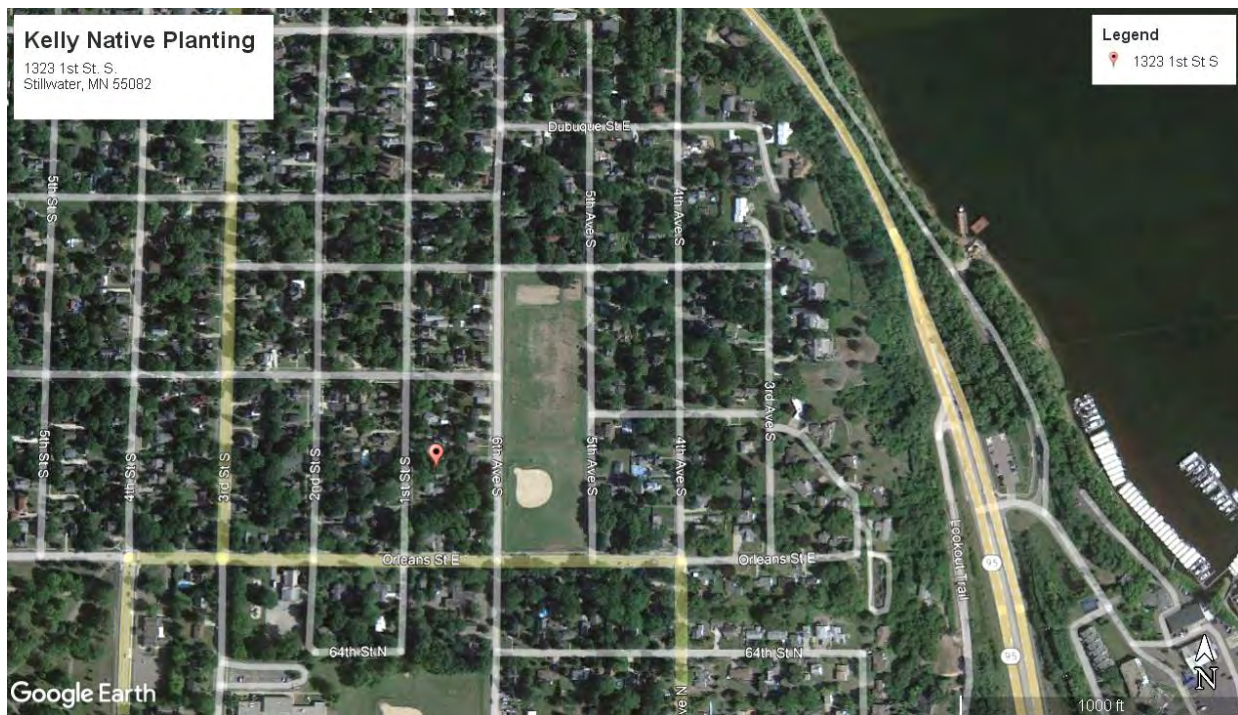
RE: 1323 1st St. S.
Stillwater, MN 55082

The Kelly’s are applying for the Landscaping for Habitat grant. They would like to install a 200 sq. ft. native planting for the back (east) and south side home landscape. Their property is located less than 0.5 miles from the St. Croix River, making it an ideal location for a water quality and habitat improvement project.

Project Estimate: \$331.70 (*Materials Estimate:* \$231.70)
Amount of Phosphorus Removed: n/a
Cost Share Requested: \$250.00

Requested Board Action:
Motion by Board Member 1, seconded by Board Member 2, to approve encumbrance of \$250.00 cost share for the installation of the Kelly native planting.

Location & Photos:







MEMORANDUM

TO: Matt Downing, Administrator
FROM: Rebecca Nestingen, PE
DATE: May 6, 2022

RE: 8a) 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):

- **MN Party Bus.** The applicant was notified after the September MSCWMO meeting by the City of Lakeland Shores that they were not in compliance with their approved site plan and permit. City staff requested the MSCWMO take the lead on enforcement related to permit compliance. The applicant retained the designer of the original site plan to make modifications and complete the resubmittal. The resubmittal was reviewed and meets MSCWMO performance standards. Full and final compliance with standards will be determined upon submittal of as-builts and measured infiltration as well as an executed maintenance agreement.
- **Baylon Boathouse.** Solution Blue submitted a project review application on January 19th, 2022 for a boathouse reconstruction at 165 Lakeland Shores Road, West Lakeland Township, MN. The project is within the St. Croix Riverway but does not add any impervious therefore permanent stormwater management BMPs were not required. There are a number of concerns with the project not meeting the Lakeland Shoreland management and Floodplain ordinances. The project will likely require setback variances and a conditional use permit from the City of Lakeland. The ESC plan is meets all MSCWMO performance standards except for the construction within the bluffline setback. The applicant has applied for City variances and a conditional use permit.
- **Burton Retaining Walls.** The MSCWMO received project review submittal materials on August 27th, 2021 for the repair and replacement of failing retaining walls and the construction of a new patio at 313 Quixote Ave N in Lakeland Shores. The MSCWMO staff meet with the project applicant on August 31st and advised the applicant the MSCWMO prohibits construction within 40 feet of the top of blufflines and requires BMPs to achieve volume control when 500 square feet or more of impervious surface is added. The applicant revised the project scope so that construction within the 40 foot bluffline setback is limited to repair/replacement of existing retaining walls. *MSCWMO staff recommends approval with no conditions.*
- **St. Michael’s Cemetery.** The MSCWMO reviewed and recommended approval on February 23rd, 2022 for the addition of road and sidewalk at the St. Michael’s Cemetery in the City of Bayport. An as-built survey and supporting documents were reviewed by the City Engineer and it was found that the site grading for the stormwater basins was not completed according to the approved grading plan and therefore the project does not meet the MSCWMO performance standards. The City of Bayport has informed the applicant the project requires regrading.
- **Park Dental.** The Middle St. Croix Watershed Management Organization (MSCWMO) received an application for project review on September 15th, 2021 for the demolition of existing building and utilities and reconstruction of a new building and associated improvements at 13961 60th St. N, located within MSCWMO boundaries and in the City of Oak Park Heights. An initial

recommendation of conditional approval was made on November 4th, 2021 but the City of Oak Park Heights did not approve the project based upon the use of infiltration in a high vulnerability DWSMA. The applicant resubmitted the project with a revised the stormwater treatment system to utilize a filtration system and flexible treatment options to comply with the MSCWMO performance standards. *MSCWMO staff recommends approval with three conditions.*

- **Villas of Inspiration.** The developer has been in contact with the WMO and the City of Bayport regarding the looming expiration of the letter of credit. An as-built survey and supporting documents were reviewed by MSCWMO staff in January 2021 and in correspondence with the City of Bayport public works staff and the developer's engineer it was documented that the infiltration basin was short on volume retention required and the basin could be regraded or the outlet raised to remedy the shortage of volume retention. No information has been provided for review.
- **2022 Stillwater Street.** An application for project review was submitted on March 29th, 2022 for the City of Stillwater 2022 Street Improvement project which includes pavement rehabilitation, storm and sanitary sewer repair, curb and gutter repair, and sidewalk replacement for numerous City streets. Also included is the addition of 650 feet of new sidewalk along Brick Street and new curb along Ramsey Street. Additional submittal materials were sent to MSCWMO on April 1st, 2022. The plans did not provide enough information on the proposed rain gardens to determine compliance with MSCWMO performance standards and corrections are needed to the HydroCAD model to determine compliance with rate control standards. The rain gardens are also located in an emergency response area (ERA) that is in a high vulnerability DWSMA so infiltration is prohibited and they will need to be designed as biofiltration practices and supply documentation of compliance with MIDS flexible treatment options. *MSCWMO staff recommends the applicant revise and resubmit the project for further review.*
- **MNDOT SP8282-145.** An application for project review and required submittal items were received on April 4th, 2022 for the grading, shoulder rehabilitation, and temporary crossovers along TH94 located within MSCWMO boundaries and in the Cities of Afton and Lakeland and West Lakeland Township. The project disturbs 12.1 acres within the MSCWMO which consists of mostly pavement rehabilitation, not full reconstruction and temporary added impervious for traffic crossovers. The added impervious will be utilized during the construction of future project SP 8282-132 and will be removed thereafter in approximately one year. The project demonstrates compliance with erosion and sediment control performance standards. *MSCWMO staff recommends approval with no conditions.*
- **Northern Natural Gas.** An application for project review and required submittal items were received on April 29th, 2022 for the replacement of 2,320 feet of natural gas pipeline and install a pipeline inspection gauge receiver at the existing Stillwater #1 TBS within MSCWMO boundaries and in the City of Oak Park Heights and Baytown Township. The project disturbs 6.31 acres within the MSCWMO which consists of excavating for the installation of piping, adjacent temporary workspace for equipment staging, and expansion of the gravel impervious surfaces at the Stillwater #1 MN TBS facility by 0.06 acres. The project requires compliance with erosion and sediment control performance standards but is below the threshold for requiring compliance with stormwater management performance standards. *MSCWMO staff recommends approval with no conditions.*

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 6, 2022

Kim Points
City Administrator
City of Lakeland Shores
P.O. Box 246
Lakeland Shores, MN 55043

RE: Baylon Boathouse

Dear Ms. Points,

The Middle St. Croix Watershed Management Organization (MSCWMO) received an application for project review on January 19th, 2022 for a boathouse reconstruction at 165 Lakeland Shores Road located within MSCWMO boundaries and in the City of Lakeland Shores. The proposed project qualifies for full review under the MSCWMO 2015 MSCWMO Watershed Management Plan (WMP). The project is within the St. Croix Riverway but does not add any impervious therefore permanent stormwater management BMPs were not required. There are a number of concerns with the project not meeting Shoreland Management ordinance and Floodplain ordinance. The project will likely require a variance and conditional use permit. The project does not comply with Section 7.3.1.H of the MSCWMO Watershed Management Plan which prohibits construction within the bluffline setback. **The MSCWMO recommends the applicant demonstrate compliance or obtain variances to City Ordinances.**

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 if you have any questions regarding these comments.

Sincerely,

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

Matt Downing
MSCWMO, Administrator

Enclosure



MSCWMO PROJECT REVIEW- SINGLE LOT RESIDENTIAL SUBMITTALS

This document is for guidance. Applicants should consult the MSCWMO Watershed Management Plan for specific requirements. MSCWMO may request other items during the review process in addition to those listed.

MSCWMO Project Review ID: 22-003

Project Name: Baylon Boathouse

Applicant: John Hink

Purpose: Replace Boathouse

Location: 165 Lakeland Shores Road, Lakeland Shores, MN

Review date: 5/6/2022

Recommendation: Demonstrate compliance or obtain variances to City Shoreland and Floodplain ordinances.

ALL SUBMITTALS MUST CONTAIN THE FOLLOWING ITEMS:

- 1. Review Fee: Single lot residential \$350 fee.
- 2. Grading plan showing grading limits, existing and proposed contours related to NAVD 1988 datum (preferred) or NGVD 1929.
- 3. Location of existing and proposed permanent structures.
- 4. Ordinary High Water (OHW) elevations and location of all existing water bodies.
- 5. Location of all bluff lines. **A variance will likely be required from City Zoning Ordinances for construction within the bluffline setback.**



- 6. Lowest floor elevations of structures built adjacent to stormwater management features and other water bodies must be a minimum of two feet above the 100-year flood elevation. *FFE is 685.5' and RFPE is 694.0' so the low floor elevation does not meet requirements. A properly flood-proofed lower level and conditional use permit will likely be required. The structure is also in a Zone AE floodplain that does not have a delineated floodway so applicants will need to provide certification prepared by experienced Professional Engineers that show the site is food fringe and encroachment will not cause a rise greater than allowable.*
- 7. Delineation of existing wetland, shoreland, ordinary high water levels, drain tiling, and floodplain areas.
- 8. Details of proposed buffer upslope of water resources including size and vegetation characteristics (when applicable).
- 9. Erosion/sediment control plan demonstrating locations, specifications, and details of the following items:
 - A. Erosion Prevention
 - i. Stabilize all exposed soil areas (including stockpiles) with temporary erosion control (seed and mulch or blanket) within 7 days after construction activities in the area have temporarily or permanently ceased.
 - ii. Identify location, type and quantity of temporary erosion prevention practices.
 - iii. Identify permanent vegetation.
 - B. Sediment Control
 - i. Sediment control practices will be placed down-gradient before up-gradient land disturbing activities begin.
 - ii. Identify the location, type and quantity of sediment control practices.
 - iii. Vehicle tracking practices must be in place to minimize track out of sediment from the construction site. Streets must be cleaned if tracking practices are not adequate to prevent sediment from being tracked onto the street.
 - C. Inspections and Maintenance
 - i. Applicant must inspect all erosion prevention and sediment control practices once every 7 days or after a ½" rain event to ensure integrity and effectiveness. All nonfunctional practices must be repaired, replaced or enhanced the next business day after discovery.



- ii. Plans shall include contact information including email and a phone number of the person responsible for inspection and compliance with erosion and sediment control.

D. Pollution Prevention

- i. Solid waste must be stored, collected and disposed of in accordance with state law.
- ii. Provide effective containment for all liquid and solid wastes generated by washout operations (concrete, stucco, paint, form release oils, curing compounds).
- iii. Hazardous materials that have potential to leach pollutants must be under cover to minimize contact with stormwater.

E. Final Stabilization

- i. For residential construction only, individual lots are considered final stabilized if the structures are finished and temporary erosion protection and downgradient sediment control has been completed.
- ii. Grading and landscape plans shall include soil tillage and soil bed preparation methods that are employed prior to landscape installation to a minimum depth of 8" and incorporate amendments to meet Minnesota State Stormwater Manual predevelopment soil type bulk densities.
 - 1. Observe minimum setbacks for areas within the dripline of existing trees, over utilities within 30 in of the surface, where compaction is required by design and inaccessible slopes.

NA 10. Details of proposed structural stormwater practices (Meets Minnesota Stormwater Manual guidelines) – *NA, less than 500 sf new/reconstructed impervious*

- A. Stormwater flows are diverted away from bluffs whenever feasible.
- B. Volume control facilities must drain down within 48 hours, as required by the MPCA NPDES Construction Stormwater Permit.
 - i. The period of inundation shall be calculated using the maximum water depth below the surface discharge elevation and the soil infiltration rate.
- C. The maximum water depth for volume control facilities is 1.5 feet.
- D. Planting plan identified vegetation suitable for the hydrology of the basin.
- E. Separation from seasonally saturated soils or bedrock is 3 feet or more for bioretention and infiltration practices.

MIDDLE ST. CROIX WATERSHED MANAGEMENT ORGANIZATION

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



F. Volume control facilities meet the following setback requirements:

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

G. Volume control is provided for the first 1.1” inch of runoff for all impervious:

| Volume Retention Required (cu. ft.) | Volume Retention Provided (cu. ft.) |
|-------------------------------------|-------------------------------------|
| XXX sf * 1.1”= XXX cf | BMP #1 Volume = |
| XXX cf total required | BMP #2 Volume = |
| | Total = |

H. Construction Standards

- i. To prevent soil compaction, the proposed volume control facility must be staked off and marked during construction to prevent heavy equipment and traffic from traveling over it.
- ii. Facilities may not be excavated within 2.0 feet of final grade until the contributing drainage area has been constructed and fully stabilized.
- iii. Facilities are in-place during construction activities, all sediment and runoff must be diverted away the facility, using practices such as pipe capping or diversions.
- iv. Facilities installation must occur in dry soil conditions. Excavation, soil placement and rapid stabilization of perimeter slopes must be accomplished prior to the next precipitation event.
- v. 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.
- vi. Prior to the release of any remaining fee or security, the owner must provide documentation that constructed volume control facilities perform as designed.

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I. Details

- i. Include a standard cross section of the infiltration device similar to those identified in the Minnesota Stormwater Manual
http://stormwater.pca.state.mn.us/index.php/Bioretention_plan_and_section_drawings
- ii. The cross section must detail the infiltration media used in the device. Typically, devices use Mix B as described in the Minnesota Stormwater Manual: A well-blended, homogenous mixture of 70 to 85 percent washed construction sand; and 15 to 30 percent [MnDOT Grade 2 compost](#).

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May 5, 2022

Kim Points
City Administrator
City of Lakeland Shores
P.O. Box 246
Lakeland Shores, MN 55043

RE: Burton Retaining Walls

Dear Ms. Points,

The Middle St. Croix Watershed Management Organization (MSCWMO) received an application for project review on August 27th, 2021 for repair and replacement of failing retaining walls at 313 Quixote Ave N located within MSCWMO boundaries and in the City of Lakeland Shores. The proposed project qualifies for full review under the MSCWMO 2015 MSCWMO Watershed Management Plan (WMP). The project is within the St. Croix Riverway but does not add any impervious therefore permanent stormwater management BMPs were not required. The applicant has limited construction within 40 feet of the top of the bluffline to the repair/replacement of failing retaining walls and is not proposing any significant grading within the bluffline setback. **The MSCWMO recommends approval with no conditions.**

This recommended approval is based on the technical review of MSCWMO performance standards and does not constitute approval by the Lakeland Shores. 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 if you have any questions regarding these comments.

Sincerely,

A handwritten signature in black ink, appearing to read 'Matt Downing', written over a light blue circular stamp.

Matt Downing
MSCWMO, Administrator

Enclosure



PROJECT REVIEW FOR SINGLE LOT RESIDENTIAL

MSCWMO Review ID: 21-008

Project Name: Burton Retaining Wall

Applicant: Libby Montreui

Purpose: Replace existing failing retaining walls with boulder retaining walls

Location: 313 Quixote Ave N

Review Date: 5/6/2022

Recommendation: Approval with no conditions.

Submittal Items:

- A completed and signed project review application form and \$350 review fee.
- Grading plan showing grading limits, existing and proposed site contour elevations related to NAVD 1988 datum (preferred) or NGVD, 1929.
- Location of proposed and existing permanent structures.
- Ordinary High Water (OHW) elevations and location of all existing water bodies.
- Location of all bluff lines. **Construction is prohibited within 40' of the top of blufflines according to MSCWMO standard 7.3.1.H. MSCWMO will make an exception for repair/replacement of existing retaining walls to keep the existing grade stabilized.**
- Lowest floor elevations of structures built adjacent to stormwater management features and other water bodies must be a minimum of two feet above the regulator flood protection elevation.
- Delineation of existing wetlands, shoreland, ordinary high water levels, drain tiling, and floodplain areas.
- Details of proposed buffer upslope of water resources including site and vegetation characteristics (when applicable).
- Location of the 100-year flood elevation, natural overflow elevation, and lowest floor elevations.
- Erosion and sediment control plan demonstrating locations, specifications, and details of the following items:
 - A. Erosion Prevention
 - i. Stabilize all exposed soil areas (including stockpiles) with temporary erosion control (seed and mulch or blanket) within 7 days after construction activities in the area have temporarily or permanently ceased.
 - ii. Identify location, type and quantity of temporary erosion prevention practices.
 - iii. Identify permanent vegetation.
 - B. Sediment Control
 - i. Sediment control practices will be placed down-gradient before up-gradient land disturbing activities begin.

- ii. Identify the location, type and quantity of sediment control practices.
- iii. Vehicle tracking practices must be in place to minimize track out of sediment from the construction site. Streets must be cleaned if tracking practices are not adequate to prevent sediment from being tracked onto the street.

C. Inspections and Maintenance

- i. Applicant must inspect all erosion prevention and sediment control practices once every 7 days or after a ½” rain event to ensure integrity and effectiveness. All nonfunctional practices must be repaired, replaced or enhanced the next business day after discovery.
- ii. Plans shall include contact information including email and a phone number of the person responsible for inspection and compliance with erosion and sediment control.

D. Pollution Prevention

- i. Solid waste must be stored, collected and disposed of in accordance with state law.
- ii. Provide effective containment for all liquid and solid wastes generated by washout operations (concrete, stucco, paint, form release oils, curing compounds).
- iii. Hazardous materials that have potential to leach pollutants must be under cover to minimize contact with stormwater.

E. Final Stabilization

- i. For residential construction only, individual lots are considered final stabilized if the structures are finished and temporary erosion protection and down gradient sediment control has been completed.
- ii. Grading and landscape plans shall include soil tillage and soil bed preparation methods that are employed prior to landscape installation to a minimum depth of 8” and incorporate amendments to meet Minnesota State Stormwater Manual predevelopment soil type bulk densities.
 - 1. Observe minimum setbacks for areas within the dripline of existing trees, over utilities within 30 in of the surface, where compaction is required by design and inaccessible slopes.

NA Details of proposed structural stormwater practices (Meets Minnesota Stormwater Manual guidelines)

- A. Stormwater flows are diverted away from bluffs whenever feasible.
- B. Volume control facilities must drain down within 48 hours, as required by the MPCA NPDES Construction Stormwater Permit.
 - i. The period of inundation shall be calculated using the maximum water depth below the surface discharge elevation and the soil infiltration rate.
- C. The maximum water depth for volume control facilities is 1.5 feet.
- D. Planting plan identified vegetation suitable for the hydrology of the basin.
- E. Separation from seasonally saturated soils or bedrock is 3 feet or more for bioretention and infiltration practices.
- F. Volume control facilities meet the following setback requirements:

| 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

- G. Volume control is provided for the first 1.1” inch of runoff for all impervious:

| Volume Retention Required (cu. ft.) | Volume Retention Provided (cu. ft.) | | | | | | |
|---|---|------------|---------------|--------|---------------|--------|---------------|
| $XX,XXX \text{ sq. ft.} \times \frac{1.1 \text{ in}}{12 \text{ in/ft}} = X,XXX \text{ cu. ft.}$ | <table border="0"> <tr> <td>BMP</td> <td>Volume</td> </tr> <tr> <td>BMP #1</td> <td>X,XXX cu. ft.</td> </tr> <tr> <td>BMP #2</td> <td>X,XXX cu. ft.</td> </tr> </table> | BMP | Volume | BMP #1 | X,XXX cu. ft. | BMP #2 | X,XXX cu. ft. |
| BMP | Volume | | | | | | |
| BMP #1 | X,XXX cu. ft. | | | | | | |
| BMP #2 | X,XXX cu. ft. | | | | | | |
| Total Required Volume Retention = X,XXX cu. ft. | Total Provided Volume Retention = X,XXX cu. ft. | | | | | | |

H. Construction Standards

- i. To prevent soil compaction, the proposed volume control facility must be staked off and marked during construction to prevent heavy equipment and traffic from traveling over it.
- ii. Facilities may not be excavated within 2.0 feet of final grade until the contributing drainage area has been constructed and fully stabilized.
- iii. Facilities are in-place during construction activities, all sediment and runoff must be diverted away the facility, using practices such as pipe capping or diversions.
- iv. Facilities installation must occur in dry soil conditions. Excavation, soil placement and rapid stabilization of perimeter slopes must be accomplished prior to the next precipitation event.
- v. 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.
- vi. Prior to the release of any remaining fee or security, the owner must provide documentation that constructed volume control facilities perform as designed.

I. Details

- i. Include a standard cross section of the infiltration device similar to those identified in the Minnesota Stormwater Manual (https://stormwater.pca.state.mn.us/index.php/Bioretenction_plan_and_section_drawings)
- ii. The cross section must detail the infiltration media used in the device. Typically, devices use Mix B as described in the Minnesota Stormwater Manual: A well-blended, homogenous mixture of 70 to 85 percent washed construction sand; and 15 to 30 percent MnDOT Grade 2 compost.

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 2, 2022

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

RE: Park Dental, Oak Park Heights

Dear Mr. Johnson,

The Middle St. Croix Watershed Management Organization (MSCWMO) received an application for project review on September 15th, 2021 for the demolition of existing building and utilities and reconstruction of a new building and associated improvements at 13961 60th St. N, 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). After the initial MSCWMO staff review the applicant was asked to revise and resubmit H&H model materials as well as provide a higher level of engineering review for the suitability of infiltration in a high vulnerability DWSMA on September 17th, 2021. The higher level of engineering review was received on October 19th, 2021 and revised H&H model submittal materials were received November 3rd, 2021. The City of Oak Park Heights has more restrictive standards prohibiting infiltration in the high vulnerability DWSMA so a revised submittal was provided on March 31st that utilizes flexible treatment options to comply with the performance standards identified in Section 7.0 of the MSCWMO Watershed Management Plan. The MSCWMO recommends approval with the following three conditions:

1. Flowage easements up to the 100-yr flood level have been secured for stormwater management facilities.
2. A proposed maintenance agreement approved by the city is provided.
3. Methods to demonstrate filtration basin is functioning as designed prior to the release of any remaining fee or security are identified in the plans.

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 if you have any questions regarding these comments.

Sincerely,

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

Matt Downing
MSCWMO, Administrator

Enclosure



PROJECT REVIEW

MSCWMO Project Review ID: 21-010

Project Name: Park Dental St. Croix Valley

Applicant: Vicki VanDell

Purpose: Demolition of existing buildings and utilities, reconstruction of a new building with associated improvements.

Location: 13961 60th St N, Oak Park Heights

Review date: 4/12/22

Recommendation: Approval with the following conditions:

1. Flowage easements up to the 100-yr flood level have been secured for stormwater management facilities.
2. A proposed maintenance agreement approved by the city is provided.
3. Methods to demonstrate infiltration or filtration basin is functioning as designed prior to the release of any remaining fee or security are identified in the plans.

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
- 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.

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.
 - 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 3,600ft³/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.

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
- 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.) | |
|-------------------------------------|-------------------------------------|---------------|
| 0.882 ac *1.1” = 3,522 cu. ft. | BMP | Volume |
| | BMP #1 | 15 cu. ft. |
| | BMP #2 | 12 cu. ft. |

| | | | |
|-----------------------|---------------------|-----------------------|------------------|
| Total Required | 3,522cu. ft. | Total Proposed | 27 cu.ft. |
|-----------------------|---------------------|-----------------------|------------------|

Flexible Treatment Options (when applicable)

- 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.
- MIDS calculator submission removes 60% 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. [Higher level of engineering review completed for DWSMA.](#)
 - 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 ft²; between 1,000 and 5,000 ft², two borings, between 5,000 and 10,000 ft², three borings and greater than 10,000 ft² 4 borings plus an additional boring for every 2,500 ft² beyond 12,500 ft²
- 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.

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.
- 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

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



May 5, 2022

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

RE: 2022 Stillwater Street Improvement Project

Dear Mr. Sanders:

The Middle St. Croix Watershed Management Organization (MSCWMO) received a project review application on March 29th, 2022 and additional submittal items on April 1st, 2022 for the City of Stillwater 2022 Street Improvement project 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 project involves approximately 13,000 square feet of new and/or reconstructed impervious surface and must demonstrate compliance with MSCWMO stormwater management volume/rate control and erosion and sediment control performance standards. The plans did not provide enough information on the proposed rain gardens to determine compliance with MSCWMO performance standards and corrections are needed to the HydroCAD model to determine compliance with rate control standards. The rain gardens are also located in an emergency response area (ERA) that is in a high vulnerability DWSMA so infiltration is prohibited and they will need to be designed as biofiltration practices and supply documentation of compliance with MIDS flexible treatment options. **The MSCWMO recommends the project is revised and resubmitted to include and address highlighted items and comments in the attached review checklist.**

MSCWMO review process information can be downloaded from www.mscwmo.org. Please contact me at 651-275-1136 x22 or mdowning@mnwcd.org if you have any questions regarding these comments.

Sincerely,

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

Matt Downing
Administrator
Middle St. Croix Watershed Management Organization



PROJECT REVIEW

MSCWMO Review ID: 22-006

Project Name: 2022 Street Improvement Project

Applicant: Reabar Abdullah

Purpose: Brick Street Reconstruction and addition of sidewalk on west side of the street

Location: 100-198 Brick Street S, Stillwater

Review Date: 5/3/2022

Recommendation: Revise and resubmit to include and address highlighted items and comments in the following checklist.

Applicability:

- Any project undertaking grading, filling, or other land alteration activities which 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 reconstruct 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, grading within public waters, grading within buffers or 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 add 500 square feet 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:

- A completed and signed project review application form and review fee.
- Grading Plan/Mapping Exhibits:
 - Property lines and delineation of lands under ownership of the applicant.
 - Delineation of existing on-site wetlands, shoreland and/or floodplain areas (including any buffers).
 - Ordinary High Water (OHW) elevations and datum, as determined by the MDNR (if applicable).

- Existing and proposed site contour elevations related to NAVD 1988 datum (preferred) or NGVD, 1929. Datum must be noted on exhibits.

NA 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. (Not required for sites within public right-of-way)

NA Minimum building elevation for each lot.

- Identification of downstream water body.
- Delineation of the subwatersheds contributing runoff from off-site, proposed and existing on-site subwatersheds, and flow directions/patterns.
- Location, alignment, and elevation of proposed and existing stormwater facilities.

NA Existing and proposed normal water elevations and the critical (the highest) water level produced from the 100-year 24-hour storms.

NA Location of the 100-year flood elevation, natural overflow elevation, and lowest floor elevations.

- A Stormwater Pollution Prevention Plan in compliance with the requirements of the NPDES SDS Construction Stormwater Permit. SWPPP needs to be updated with 2022 proposed project work, receiving waters, and plan locations of SWPPP components.
- Permanent Stormwater Management System in compliance with the requirements of the NPDES SDS Construction Stormwater Permit and MSCWMO Performance Standards.
 - Impervious areas (Pre- and Post-Construction).
 - Construction plans and specifications for all proposed stormwater management facilities. Plans do not contain any grading or construction details for proposed rain gardens.

NA 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.

- Hydrologic/Hydraulic Design Exhibits:
 - 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. HydroCAD models should be revised and resubmitted with appropriate rainfall distribution for Atlas 14 rainfall depths (MSE 3) and appropriate minimum time of concentration.
 - A table (or tables) must be submitted showing the following:
 - A listing of all points where runoff leaves the site and the existing and proposed stormwater runoff rates and volumes.
 - 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 A proposed maintenance agreement, which may be in the format of Appendix K, or other form approved by the city.

Special or Impaired Water:

- This site drains to, and is within one mile of special or impaired water and complies with the following enhanced protections:
 - Stabilization initiated immediately and all soils protected in seven days/provide temp basin for five acres draining to common location.
 - Treat water quality volume of one inch of runoff by retaining on site unless not feasible due to site conditions
- NA Maintain buffer zone of 100 linear feet from Special Water.

STORMWATER MANAGEMENT PERFORMANCE STANDARDS

- 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. **HydroCAD models should be revised and resubmitted with appropriate rainfall distribution for Atlas 14 rainfall depths (MSE 3) and appropriate minimum time of concentration. (Brick Street model subcatchment B2 has a time of concentration of 0 minutes and should be revised to 10 minutes so the peak rates are not artificially offset for proposed conditions).**
- 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. **Storage ranges for rain gardens are exceeded during 10- and 100-year design events. Secondary overflow or bypass should be defined in model to avoid model errors.**

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.

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

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.

| Volume Retention Required (cu. ft.) | Volume Retention Provided (cu. ft.) | | | | | | |
|---|---|------------|---------------|--------|-------------|--------|-------------|
| $4594 \text{ sq. ft.} \times \frac{1.1 \text{ in}}{12 \text{ in/ft}} = 421 \text{ cu. ft.}$ $8328 \text{ sq. ft.} \times \frac{0.55 \text{ in}}{12 \text{ in/ft}} = 382 \text{ cu. ft.}$ | <table border="0"> <tr> <td>BMP</td> <td>Volume</td> </tr> <tr> <td>BMP #1</td> <td>450 cu. ft.</td> </tr> <tr> <td>BMP #2</td> <td>300 cu. ft.</td> </tr> </table> | BMP | Volume | BMP #1 | 450 cu. ft. | BMP #2 | 300 cu. ft. |
| BMP | Volume | | | | | | |
| BMP #1 | 450 cu. ft. | | | | | | |
| BMP #2 | 300 cu. ft. | | | | | | |
| Total Required Volume Retention = 421 cu. ft. | Total Provided Volume Retention = 750 cu. ft. | | | | | | |

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 FTO #1: MIDS calculator submission removes 75% of the annual total phosphorous.
- NA FTO #2: MIDS calculator submission removes 60% of the annual total phosphorous.
- NA FTO #3: Offsite mitigation equivalent to the volume reduction standard is provided.

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. **Plans do not contain any grading or construction details for proposed rain gardens.**
- 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 not authorized to infiltrate under an National Pollutant Discharge Elimination System (NPDES)/State Disposal System (SDS) Permit issued by the MPCA. **Rain gardens are located within an Emergency Response Area (ERA) within a DWSMA classified as having a high vulnerability where infiltration systems are prohibited by the NPDES Construction Stormwater Permit.**
 - 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. **Low outlet of Ramsey rain garden is 2.25' above invert with 0.45 in/hr infiltration rate. Low outlet of Brick rain garden is 2.25' above invert with 0.2 in/hr infiltration rate. Maximum infiltration depth (at low surface outlet) should be determined based on the depth that will infiltrate within 48 hours at the design infiltration rate or a maximum of 1.5' based on MSCWMO performance standards.**
 - 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. **See above comment.**
- NA 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 ft²; between 1,000 and 5,000 ft², two borings; between 5,000 and 10,000 ft², three borings; and greater than 10,000 ft², 4 borings plus an additional boring for every 2,500 ft² beyond 12,500 ft².
 - 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.
- 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. **Plans do not identify an as-built survey method to demonstrate infiltration basin is functioning.**
 - Construction plans provide adequate construction guidance to prevent clogging or compaction and demonstrate performance. **Plans do not provide rain garden details or construction guidance.**
 - 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.

EROSION AND SEDIMENT CONTROL PERFORMANCE STANDARDS

- 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.
- NA 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 the following 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.

Plan Sheets

- NA Temporary Sediment Basins required (10 acres draining to common location or 5 acres App. A) and design meets the following criteria:
- a. Adequately sized – 2-year, 24-hour storm, minimum 1,800 feet/acre; or no calculative minimum 3,600ft³/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. Fifty 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).
- 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).

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.

LAKE, STREAM AND WETLAND BUFFER PERFORMANCE STANDARDS

- 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.

MIDDLE ST. CROIX WATERSHED MANAGEMENT ORGANIZATION

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



May 5, 2022

Mr. Ronald Moorse
3033 Saint Croix Trail
PO Box 219
Afton, MN 55001

RE: MNDOT SP8282-145

Dear Mr. Moorse:

The Middle St. Croix Watershed Management Organization (MSCWMO) received submittal items on April 4th, 2022 for the grading, shoulder rehabilitation, and temporary crossovers along TH94 located within MSCWMO boundaries and in the City of Afton. The proposed project qualifies for full review under the MSCWMO 2015 Watershed Management Plan (WMP).

The project disturbs 12.1 acres within the MSCWMO which consists of mostly pavement rehabilitation, not full reconstruction and temporary added impervious for traffic crossovers. The added impervious will be utilized during the construction of future project SP 8282-132 and will be removed thereafter in approximately one year. The project requires compliance with erosion and sediment control performance standards. **The MSCWMO recommends approval with no conditions.**

This recommended approval is based on the technical review of MSCWMO performance standards and does not constitute approval by the City of Afton. MSCWMO review process information can be downloaded from www.mscwmo.org. Please contact me at 651-275-1136 x22 or mdowning@mnwcd.org if you have any questions regarding these comments.

Sincerely,

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

Matt Downing
Administrator
Middle St. Croix Watershed Management Organization



PROJECT REVIEW

MSCWMO Review ID: 22-007

Project Name: MNDOT SP 8282-145

Applicant: Hunter Smoak

Purpose: MnDOT Project on Highway 94. This project includes grading, roadway shoulder rehabilitation, and the construction of temporary crossovers.

Location: TH94 in the cities of Woodbury, Afton, and Lakeland

Review Date: 5/3/2022

Recommendation: Approve with no conditions.

Applicability:

- Any project undertaking grading, filling, or other land alteration activities which 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 reconstruct 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, grading within public waters, grading within buffers or 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 add 500 square feet 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:

- A completed and signed project review application form and review fee.
- Grading Plan/Mapping Exhibits:
 - Property lines and delineation of lands under ownership of the applicant.
 - Delineation of existing on-site wetlands, shoreland and/or floodplain areas (including any buffers).

NA Ordinary High Water (OHW) elevations and datum, as determined by the MDNR (if applicable).

Existing and proposed site contour elevations related to NAVD 1988 datum (preferred) or NGVD, 1929. Datum must be noted on exhibits. **Existing and proposed elevations shown on profiles.**

NA 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. (Not required for sites within public right-of-way)

NA Minimum building elevation for each lot.

NA Identification of downstream water body.

Delineation of the subwatersheds contributing runoff from off-site, proposed and existing on-site subwatersheds, and flow directions/patterns.

Location, alignment, and elevation of proposed and existing stormwater facilities.

NA Existing and proposed normal water elevations and the critical (the highest) water level produced from the 100-year 24-hour storms.

NA Location of the 100-year flood elevation, natural overflow elevation, and lowest floor elevations.

A Stormwater Pollution Prevention Plan in compliance with the requirements of the NPDES SDS Construction Stormwater Permit.

Permanent Stormwater Management System in compliance with the requirements of the NPDES SDS Construction Stormwater Permit and MSCWMO Performance Standards.

Impervious areas (Pre- and Post-Construction).

NA Construction plans and specifications for all proposed stormwater management facilities.

NA Location(s) of past, current or future onsite well and septic systems (if applicable).

Other exhibits required to show conformance to these Performance Standards.

NA Hydrologic/Hydraulic Design Exhibits:

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.

A table (or tables) must be submitted showing the following:

A listing of all points where runoff leaves the site and the existing and proposed stormwater runoff rates and volumes.

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

Special or Impaired Water:

This site drains to, and is within one mile of special or impaired water and complies with the following enhanced protections:

Stabilization initiated immediately and all soils protected in seven days/provide temp basin for five acres draining to common location.

NA Treat water quality volume of one inch of runoff by retaining on site unless not feasible due to site conditions

Maintain buffer zone of 100 linear feet from Special Water.

STORMWATER MANAGEMENT PERFORMANCE STANDARDS

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.

NA 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 |

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.

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

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

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

| Volume Retention Required (cu. ft.) | Volume Retention Provided (cu. ft.) |
|--|-------------------------------------|
| $XX,XXX \text{ sq. ft.} \times \frac{1.1 \text{ in}}{12 \text{ in/ft}} = X,XXX \text{ cu. ft.}$ | BMP Volume |
| $XX,XXX \text{ sq. ft.} \times \frac{0.55 \text{ in}}{12 \text{ in/ft}} = X,XXX \text{ cu. ft.}$ | BMP #1 X,XXX cu. ft. |
| | BMP #2 X,XXX cu. ft. |

| | |
|--|--|
| Total Required Volume Retention = X,XXX cu. ft. | Total Provided Volume Retention = X,XXX cu. ft. |
|--|--|

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 FTO #1: MIDS calculator submission removes 75% of the annual total phosphorous.
- NA FTO #2: MIDS calculator submission removes 60% of the annual total phosphorous.
- NA FTO #3: Offsite mitigation equivalent to the volume reduction standard is provided.

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.
 - 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

| 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

- 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.
- NA 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.
- NA 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 ft²; between 1,000 and 5,000 ft², two borings; between 5,000 and 10,000 ft², three borings; and greater than 10,000 ft², 4 borings plus an additional boring for every 2,500 ft² beyond 12,500 ft².
- 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.

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.
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- 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.

EROSION AND SEDIMENT CONTROL PERFORMANCE STANDARDS

- 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.
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- iii. Finding of inspections, including the specific location where corrective actions are needed.
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 - 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.
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 - Describes dewatering technique to prevent nuisance conditions, erosion, or inundation of wetlands.
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- Describes the following pollution prevention management measures:
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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) and design meets the following criteria:
- a. Adequately sized – 2-year, 24-hour storm, minimum 1,800 feet/acre; or no calculative minimum 3,600ft³/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. Fifty 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).

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.

LAKE, STREAM AND WETLAND BUFFER PERFORMANCE STANDARDS

- 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.

MIDDLE ST. CROIX WATERSHED MANAGEMENT ORGANIZATION

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



May 5, 2022

Ms. Michelle Elsner
690 Quinnell Ave N,
PO Box 321
Lakeland, MN 55043

RE: MNDOT SP8282-145

Dear Ms. Elsner:

The Middle St. Croix Watershed Management Organization (MSCWMO) received submittal items on April 4th, 2022 for the grading, shoulder rehabilitation, and temporary crossovers along TH94 located within MSCWMO boundaries and in the City of Lakeland. The proposed project qualifies for full review under the MSCWMO 2015 Watershed Management Plan (WMP).

The project disturbs 12.1 acres within the MSCWMO which consists of mostly pavement rehabilitation, not full reconstruction and temporary added impervious for traffic crossovers. The added impervious will be utilized during the construction of future project SP 8282-132 and will be removed thereafter in approximately one year. The project requires compliance with erosion and sediment control performance standards. **The MSCWMO recommends approval with no conditions.**

This recommended approval is based on the technical review of MSCWMO performance standards and does not constitute approval by the City of Lakeland. MSCWMO review process information can be downloaded from www.mscwmo.org. Please contact me at 651-275-1136 x22 or m Downing@mnwcd.org if you have any questions regarding these comments.

Sincerely,

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

Matt Downing
Administrator
Middle St. Croix Watershed Management Organization



PROJECT REVIEW

MSCWMO Review ID: 22-007

Project Name: MNDOT SP 8282-145

Applicant: Hunter Smoak

Purpose: MnDOT Project on Highway 94. This project includes grading, roadway shoulder rehabilitation, and the construction of temporary crossovers.

Location: TH94 in the cities of Woodbury, Afton, and Lakeland

Review Date: 5/3/2022

Recommendation: Approve with no conditions.

Applicability:

- Any project undertaking grading, filling, or other land alteration activities which 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 reconstruct 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, grading within public waters, grading within buffers or 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 add 500 square feet 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:

- A completed and signed project review application form and review fee.
- Grading Plan/Mapping Exhibits:
 - Property lines and delineation of lands under ownership of the applicant.
 - Delineation of existing on-site wetlands, shoreland and/or floodplain areas (including any buffers).

NA Ordinary High Water (OHW) elevations and datum, as determined by the MDNR (if applicable).

- Existing and proposed site contour elevations related to NAVD 1988 datum (preferred) or NGVD, 1929. Datum must be noted on exhibits. **Existing and proposed elevations shown on profiles.**

NA 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. (Not required for sites within public right-of-way)

NA Minimum building elevation for each lot.

NA Identification of downstream water body.

- Delineation of the subwatersheds contributing runoff from off-site, proposed and existing on-site subwatersheds, and flow directions/patterns.

- Location, alignment, and elevation of proposed and existing stormwater facilities.

NA Existing and proposed normal water elevations and the critical (the highest) water level produced from the 100-year 24-hour storms.

NA Location of the 100-year flood elevation, natural overflow elevation, and lowest floor elevations.

- A Stormwater Pollution Prevention Plan in compliance with the requirements of the NPDES SDS Construction Stormwater Permit.

- Permanent Stormwater Management System in compliance with the requirements of the NPDES SDS Construction Stormwater Permit and MSCWMO Performance Standards.

- Impervious areas (Pre- and Post-Construction).

NA Construction plans and specifications for all proposed stormwater management facilities.

NA Location(s) of past, current or future onsite well and septic systems (if applicable).

- Other exhibits required to show conformance to these Performance Standards.

NA Hydrologic/Hydraulic Design Exhibits:

- 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.

- A table (or tables) must be submitted showing the following:

- A listing of all points where runoff leaves the site and the existing and proposed stormwater runoff rates and volumes.
- 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 A proposed maintenance agreement, which may be in the format of Appendix K, or other form approved by the city.

Special or Impaired Water:

- This site drains to, and is within one mile of special or impaired water and complies with the following enhanced protections:

Stabilization initiated immediately and all soils protected in seven days/provide temp basin for five acres draining to common location.

NA Treat water quality volume of one inch of runoff by retaining on site unless not feasible due to site conditions

Maintain buffer zone of 100 linear feet from Special Water.

STORMWATER MANAGEMENT PERFORMANCE STANDARDS

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.

NA 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 |

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.

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

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

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

| Volume Retention Required (cu. ft.) | Volume Retention Provided (cu. ft.) |
|--|-------------------------------------|
| $XX,XXX \text{ sq. ft.} \times \frac{1.1 \text{ in}}{12 \text{ in/ft}} = X,XXX \text{ cu. ft.}$ | BMP Volume |
| $XX,XXX \text{ sq. ft.} \times \frac{0.55 \text{ in}}{12 \text{ in/ft}} = X,XXX \text{ cu. ft.}$ | BMP #1 X,XXX cu. ft. |
| | BMP #2 X,XXX cu. ft. |

| | |
|--|--|
| Total Required Volume Retention = X,XXX cu. ft. | Total Provided Volume Retention = X,XXX cu. ft. |
|--|--|

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 FTO #1: MIDS calculator submission removes 75% of the annual total phosphorous.
- NA FTO #2: MIDS calculator submission removes 60% of the annual total phosphorous.
- NA FTO #3: Offsite mitigation equivalent to the volume reduction standard is provided.

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.
 - 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

| 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

- NA 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.
- NA Water quality volume will be discharged through infiltration or filtration media in 48 hours or less.
- NA 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.
- NA 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 ft²; between 1,000 and 5,000 ft², two borings; between 5,000 and 10,000 ft², three borings; and greater than 10,000 ft², 4 borings plus an additional boring for every 2,500 ft² beyond 12,500 ft².
- 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.

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.

EROSION AND SEDIMENT CONTROL PERFORMANCE STANDARDS

- 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 the following 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.

Plan Sheets

- NA Temporary Sediment Basins required (10 acres draining to common location or 5 acres App. A) and design meets the following criteria:
- a. Adequately sized – 2-year, 24-hour storm, minimum 1,800 feet/acre; or no calculative minimum 3,600ft³/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. Fifty 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).

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.

LAKE, STREAM AND WETLAND BUFFER PERFORMANCE STANDARDS

- 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.

MIDDLE ST. CROIX WATERSHED MANAGEMENT ORGANIZATION

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



May 5, 2022

Ms. Carrie Seifert
959 Paris Ave Circle N
West Lakeland Township, MN 55082

RE: MNDOT SP8282-145

Dear Ms. Seifert:

The Middle St. Croix Watershed Management Organization (MSCWMO) received submittal items on April 4th, 2022 for the grading, shoulder rehabilitation, and temporary crossovers along TH94 located within MSCWMO boundaries and in West Lakeland Township. The proposed project qualifies for full review under the MSCWMO 2015 Watershed Management Plan (WMP).

The project disturbs 12.1 acres within the MSCWMO which consists of mostly pavement rehabilitation, not full reconstruction and temporary added impervious for traffic crossovers. The added impervious will be utilized during the construction of future project SP 8282-132 and will be removed thereafter in approximately one year. The project requires compliance with erosion and sediment control performance standards. **The MSCWMO recommends approval with no conditions.**

This recommended approval is based on the technical review of MSCWMO performance standards and does not constitute approval by West Lakeland Township. MSCWMO review process information can be downloaded from www.mscwmo.org. Please contact me at 651-275-1136 x22 or 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
Administrator
Middle St. Croix Watershed Management Organization



PROJECT REVIEW

MSCWMO Review ID: 22-007

Project Name: MNDOT SP 8282-145

Applicant: Hunter Smoak

Purpose: MnDOT Project on Highway 94. This project includes grading, roadway shoulder rehabilitation, and the construction of temporary crossovers.

Location: TH94 in the cities of Woodbury, Afton, and Lakeland

Review Date: 5/3/2022

Recommendation: Approve with no conditions.

Applicability:

- Any project undertaking grading, filling, or other land alteration activities which 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 reconstruct 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, grading within public waters, grading within buffers or 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 add 500 square feet 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:

- A completed and signed project review application form and review fee.
- Grading Plan/Mapping Exhibits:
 - Property lines and delineation of lands under ownership of the applicant.
 - Delineation of existing on-site wetlands, shoreland and/or floodplain areas (including any buffers).

NA Ordinary High Water (OHW) elevations and datum, as determined by the MDNR (if applicable).

- Existing and proposed site contour elevations related to NAVD 1988 datum (preferred) or NGVD, 1929. Datum must be noted on exhibits. **Existing and proposed elevations shown on profiles.**

NA 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. (Not required for sites within public right-of-way)

NA Minimum building elevation for each lot.

NA Identification of downstream water body.

- Delineation of the subwatersheds contributing runoff from off-site, proposed and existing on-site subwatersheds, and flow directions/patterns.

- Location, alignment, and elevation of proposed and existing stormwater facilities.

NA Existing and proposed normal water elevations and the critical (the highest) water level produced from the 100-year 24-hour storms.

NA Location of the 100-year flood elevation, natural overflow elevation, and lowest floor elevations.

- A Stormwater Pollution Prevention Plan in compliance with the requirements of the NPDES SDS Construction Stormwater Permit.

- Permanent Stormwater Management System in compliance with the requirements of the NPDES SDS Construction Stormwater Permit and MSCWMO Performance Standards.

- Impervious areas (Pre- and Post-Construction).

NA Construction plans and specifications for all proposed stormwater management facilities.

NA Location(s) of past, current or future onsite well and septic systems (if applicable).

- Other exhibits required to show conformance to these Performance Standards.

NA Hydrologic/Hydraulic Design Exhibits:

- 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.
- A table (or tables) must be submitted showing the following:
 - A listing of all points where runoff leaves the site and the existing and proposed stormwater runoff rates and volumes.
 - 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 A proposed maintenance agreement, which may be in the format of Appendix K, or other form approved by the city.

Special or Impaired Water:

- This site drains to, and is within one mile of special or impaired water and complies with the following enhanced protections:

Stabilization initiated immediately and all soils protected in seven days/provide temp basin for five acres draining to common location.

NA Treat water quality volume of one inch of runoff by retaining on site unless not feasible due to site conditions

Maintain buffer zone of 100 linear feet from Special Water.

STORMWATER MANAGEMENT PERFORMANCE STANDARDS

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.

NA 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 |

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.

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

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

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

| Volume Retention Required (cu. ft.) | Volume Retention Provided (cu. ft.) |
|--|-------------------------------------|
| $XX,XXX \text{ sq. ft.} \times \frac{1.1 \text{ in}}{12 \text{ in/ft}} = X,XXX \text{ cu. ft.}$ | BMP Volume |
| $XX,XXX \text{ sq. ft.} \times \frac{0.55 \text{ in}}{12 \text{ in/ft}} = X,XXX \text{ cu. ft.}$ | BMP #1 X,XXX cu. ft. |
| | BMP #2 X,XXX cu. ft. |

| | |
|--|--|
| Total Required Volume Retention = X,XXX cu. ft. | Total Provided Volume Retention = X,XXX cu. ft. |
|--|--|

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 FTO #1: MIDS calculator submission removes 75% of the annual total phosphorous.
- NA FTO #2: MIDS calculator submission removes 60% of the annual total phosphorous.
- NA FTO #3: Offsite mitigation equivalent to the volume reduction standard is provided.

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.
 - 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

| 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

- NA 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.
- NA Water quality volume will be discharged through infiltration or filtration media in 48 hours or less.
- NA 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.
- NA 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 ft²; between 1,000 and 5,000 ft², two borings; between 5,000 and 10,000 ft², three borings; and greater than 10,000 ft², 4 borings plus an additional boring for every 2,500 ft² beyond 12,500 ft².
- 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.

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.

EROSION AND SEDIMENT CONTROL PERFORMANCE STANDARDS

- 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 the following 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.

Plan Sheets

- NA Temporary Sediment Basins required (10 acres draining to common location or 5 acres App. A) and design meets the following criteria:
- a. Adequately sized – 2-year, 24-hour storm, minimum 1,800 feet/acre; or no calculative minimum 3,600ft³/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. Fifty 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).

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.

LAKE, STREAM AND WETLAND BUFFER PERFORMANCE STANDARDS

- 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.

MIDDLE ST. CROIX WATERSHED MANAGEMENT ORGANIZATION

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



May 5, 2022

Ms. Nancy Healey
4020 McDonald Dr.
Stillwater, MN 55082

RE: Northern Natural Gas – MNB86701 Stillwater Branch Line Modification

Dear Ms. Healey:

The Middle St. Croix Watershed Management Organization (MSCWMO) received submittal items on April 29th, 2022 for the replacement of 2,320 feet of natural gas pipeline and install a pipeline inspection gauge receiver at the existing Stillwater #1 TBS within MSCWMO boundaries and Baytown Township. The proposed project qualifies for full review under the MSCWMO 2015 Watershed Management Plan (WMP).

The project disturbs 6.31 acres within the MSCWMO which consists of excavating for the installation of piping, adjacent temporary workspace for equipment staging, and expansion of the gravel impervious surfaces at the Stillwater #1 MN TBS facility by 0.06 acres. The project requires compliance with erosion and sediment control performance standards but is below the threshold for requiring compliance with stormwater management performance standards. **The MSCWMO recommends approval with no conditions.**

This recommended approval is based on the technical review of MSCWMO performance standards and does not constitute approval by the Baytown Township. MSCWMO review process information can be downloaded from www.mscwmo.org. Please contact me at 651-275-1136 x22 or mdowning@mnwcd.org if you have any questions regarding these comments.

Sincerely,

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

Matt Downing
Administrator
Middle St. Croix Watershed Management Organization



PROJECT REVIEW

MSCWMO Review ID: 22-008

Project Name: Northern Natural Gas – MNB86701 Stillwater Branch Line Modification

Applicant: Richard Anderson, ProSource Technologies

Purpose: Replace 2,320 feet of natural gas pipeline and install a pipeline inspection gauge receiver at the existing Stillwater #1 TBS.

Location: 1120 Centre Pointe Drive, Baytown, MN 55120

Review Date: 5/5/2022

Recommendation: Approve with no conditions.

Applicability:

- Any project undertaking grading, filling, or other land alteration activities which 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 reconstruct 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, grading within public waters, grading within buffers or 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 add 500 square feet 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:

- A completed and signed project review application form and review fee.
- Grading Plan/Mapping Exhibits:
 - Property lines and delineation of lands under ownership of the applicant.
 - Delineation of existing on-site wetlands, shoreland and/or floodplain areas (including any buffers).

NA Ordinary High Water (OHW) elevations and datum, as determined by the MDNR (if applicable).

- Existing and proposed site contour elevations related to NAVD 1988 datum (preferred) or NGVD, 1929. Datum must be noted on exhibits.

NA 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. (Not required for sites within public right-of-way)

NA Minimum building elevation for each lot.

- Identification of downstream water body.
- Delineation of the subwatersheds contributing runoff from off-site, proposed and existing on-site subwatersheds, and flow directions/patterns.

NA Location, alignment, and elevation of proposed and existing stormwater facilities.

NA Existing and proposed normal water elevations and the critical (the highest) water level produced from the 100-year 24-hour storms.

NA Location of the 100-year flood elevation, natural overflow elevation, and lowest floor elevations.

- A Stormwater Pollution Prevention Plan in compliance with the requirements of the NPDES SDS Construction Stormwater Permit.

NA Permanent Stormwater Management System in compliance with the requirements of the NPDES SDS Construction Stormwater Permit and MSCWMO Performance Standards.

NA Impervious areas (Pre- and Post-Construction).

NA Construction plans and specifications for all proposed stormwater management facilities.

NA Location(s) of past, current or future onsite well and septic systems (if applicable).

- Other exhibits required to show conformance to these Performance Standards.

NA Hydrologic/Hydraulic Design Exhibits:

NA 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.

NA A table (or tables) must be submitted showing the following:

NA A listing of all points where runoff leaves the site and the existing and proposed stormwater runoff rates and volumes.

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

Special or Impaired Water:

NA This site drains to, and is within one mile of special or impaired water and complies with the following enhanced protections:

NA Stabilization initiated immediately and all soils protected in seven days/provide temp basin for five acres draining to common location.

NA Treat water quality volume of one inch of runoff by retaining on site unless not feasible due to site conditions

NA Maintain buffer zone of 100 linear feet from Special Water.

STORMWATER MANAGEMENT PERFORMANCE STANDARDS

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.

NA 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 |

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.

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

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

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

| Volume Retention Required (cu. ft.) | Volume Retention Provided (cu. ft.) |
|--|-------------------------------------|
| $XX,XXX \text{ sq. ft.} \times \frac{1.1 \text{ in}}{12 \text{ in/ft}} = X,XXX \text{ cu. ft.}$ | BMP Volume |
| $XX,XXX \text{ sq. ft.} \times \frac{0.55 \text{ in}}{12 \text{ in/ft}} = X,XXX \text{ cu. ft.}$ | BMP #1 X,XXX cu. ft. |
| | BMP #2 X,XXX cu. ft. |

| | |
|--|--|
| Total Required Volume Retention = X,XXX cu. ft. | Total Provided Volume Retention = X,XXX cu. ft. |
|--|--|

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 FTO #1: MIDS calculator submission removes 75% of the annual total phosphorous.
- NA FTO #2: MIDS calculator submission removes 60% of the annual total phosphorous.
- NA FTO #3: Offsite mitigation equivalent to the volume reduction standard is provided.

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.
 - 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

| 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

- NA 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.
- NA Water quality volume will be discharged through infiltration or filtration media in 48 hours or less.
- NA 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.
- NA 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 ft²; between 1,000 and 5,000 ft², two borings; between 5,000 and 10,000 ft², three borings; and greater than 10,000 ft², 4 borings plus an additional boring for every 2,500 ft² beyond 12,500 ft².
- 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.

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.

EROSION AND SEDIMENT CONTROL PERFORMANCE STANDARDS

- 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 the following 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.

Plan Sheets

- NA Temporary Sediment Basins required (10 acres draining to common location or 5 acres App. A) and design meets the following criteria:
- a. Adequately sized – 2-year, 24-hour storm, minimum 1,800 feet/acre; or no calculative minimum 3,600ft³/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.
- NA 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.
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- d. Construction site entrances minimize street tracking?
- e. Plans minimize soil compaction and, unless infeasible to preserve topsoil.
- f. Fifty 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).

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).

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.

LAKE, STREAM AND WETLAND BUFFER PERFORMANCE STANDARDS

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

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.

MIDDLE ST. CROIX WATERSHED MANAGEMENT ORGANIZATION

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



May 5, 2022

Mr. Eric Johnson
14168 Oak Park Blvd. N.
Oak Park Heights, MN 55082

RE: Northern Natural Gas – MNB86701 Stillwater Branch Line Modification

Dear Mr. Johnson:

The Middle St. Croix Watershed Management Organization (MSCWMO) received submittal items on April 29th, 2022 for the replacement of 2,320 feet of natural gas pipeline and install a pipeline inspection gauge receiver at the existing Stillwater #1 TBS within MSCWMO boundaries and in the City of Oak Park Heights. The proposed project qualifies for full review under the MSCWMO 2015 Watershed Management Plan (WMP).

The project disturbs 6.31 acres within the MSCWMO which consists of excavating for the installation of piping, adjacent temporary workspace for equipment staging, and expansion of the gravel impervious surfaces at the Stillwater #1 MN TBS facility by 0.06 acres. The project requires compliance with erosion and sediment control performance standards but is below the threshold for requiring compliance with stormwater management performance standards. **The MSCWMO recommends approval with no conditions.**

This recommended approval is based on the technical review of MSCWMO performance standards and does not constitute approval by the City of Oak Park Heights. MSCWMO review process information can be downloaded from www.mscwmo.org. Please contact me at 651-275-1136 x22 or 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
Administrator
Middle St. Croix Watershed Management Organization



PROJECT REVIEW

MSCWMO Review ID: 22-008

Project Name: Northern Natural Gas – MNB86701 Stillwater Branch Line Modification

Applicant: Richard Anderson, ProSource Technologies

Purpose: Replace 2,320 feet of natural gas pipeline and install a pipeline inspection gauge receiver at the existing Stillwater #1 TBS.

Location: 1120 Centre Pointe Drive, Baytown, MN 55120

Review Date: 5/5/2022

Recommendation: Approve with no conditions.

Applicability:

- Any project undertaking grading, filling, or other land alteration activities which 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 reconstruct 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, grading within public waters, grading within buffers or 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 add 500 square feet 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:

- A completed and signed project review application form and review fee.
- Grading Plan/Mapping Exhibits:
 - Property lines and delineation of lands under ownership of the applicant.
 - Delineation of existing on-site wetlands, shoreland and/or floodplain areas (including any buffers).

NA Ordinary High Water (OHW) elevations and datum, as determined by the MDNR (if applicable).

- Existing and proposed site contour elevations related to NAVD 1988 datum (preferred) or NGVD, 1929. Datum must be noted on exhibits.

NA 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. (Not required for sites within public right-of-way)

NA Minimum building elevation for each lot.

- Identification of downstream water body.
- Delineation of the subwatersheds contributing runoff from off-site, proposed and existing on-site subwatersheds, and flow directions/patterns.

NA Location, alignment, and elevation of proposed and existing stormwater facilities.

NA Existing and proposed normal water elevations and the critical (the highest) water level produced from the 100-year 24-hour storms.

NA Location of the 100-year flood elevation, natural overflow elevation, and lowest floor elevations.

- A Stormwater Pollution Prevention Plan in compliance with the requirements of the NPDES SDS Construction Stormwater Permit.

NA Permanent Stormwater Management System in compliance with the requirements of the NPDES SDS Construction Stormwater Permit and MSCWMO Performance Standards.

NA Impervious areas (Pre- and Post-Construction).

NA Construction plans and specifications for all proposed stormwater management facilities.

NA Location(s) of past, current or future onsite well and septic systems (if applicable).

- Other exhibits required to show conformance to these Performance Standards.

NA Hydrologic/Hydraulic Design Exhibits:

NA 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.

NA A table (or tables) must be submitted showing the following:

NA A listing of all points where runoff leaves the site and the existing and proposed stormwater runoff rates and volumes.

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

Special or Impaired Water:

NA This site drains to, and is within one mile of special or impaired water and complies with the following enhanced protections:

NA Stabilization initiated immediately and all soils protected in seven days/provide temp basin for five acres draining to common location.

NA Treat water quality volume of one inch of runoff by retaining on site unless not feasible due to site conditions

NA Maintain buffer zone of 100 linear feet from Special Water.

STORMWATER MANAGEMENT PERFORMANCE STANDARDS

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.

NA 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 |

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.

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

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

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

| Volume Retention Required (cu. ft.) | Volume Retention Provided (cu. ft.) |
|--|-------------------------------------|
| $XX,XXX \text{ sq. ft.} \times \frac{1.1 \text{ in}}{12 \text{ in/ft}} = X,XXX \text{ cu. ft.}$ | BMP Volume |
| $XX,XXX \text{ sq. ft.} \times \frac{0.55 \text{ in}}{12 \text{ in/ft}} = X,XXX \text{ cu. ft.}$ | BMP #1 X,XXX cu. ft. |
| | BMP #2 X,XXX cu. ft. |

| | |
|--|--|
| Total Required Volume Retention = X,XXX cu. ft. | Total Provided Volume Retention = X,XXX cu. ft. |
|--|--|

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 FTO #1: MIDS calculator submission removes 75% of the annual total phosphorous.
- NA FTO #2: MIDS calculator submission removes 60% of the annual total phosphorous.
- NA FTO #3: Offsite mitigation equivalent to the volume reduction standard is provided.

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.
 - 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

| 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

- NA 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.
- NA Water quality volume will be discharged through infiltration or filtration media in 48 hours or less.
- NA 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.
- NA 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 ft²; between 1,000 and 5,000 ft², two borings; between 5,000 and 10,000 ft², three borings; and greater than 10,000 ft², 4 borings plus an additional boring for every 2,500 ft² beyond 12,500 ft².
- 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.

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.

EROSION AND SEDIMENT CONTROL PERFORMANCE STANDARDS

- 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 the following 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.

Plan Sheets

- NA Temporary Sediment Basins required (10 acres draining to common location or 5 acres App. A) and design meets the following criteria:
- a. Adequately sized – 2-year, 24-hour storm, minimum 1,800 feet/acre; or no calculative minimum 3,600ft³/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.
- NA 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. Fifty 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).

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).

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.

LAKE, STREAM AND WETLAND BUFFER PERFORMANCE STANDARDS

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

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.

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- May 2022

Administration

- Prepared May meeting materials
- Coordination of Grant and Permit Program
- Finalized 2021 Audit information

Project Reviews

- MN Party Bus-**INFORM**
- Baylon Boathouse-**ACTION**
- Burton Walls-**ACTION**
- St. Michael's Cemetery-**INFORM**
- Park Dental-**ACTION**
- Inspiration-**INFORM**
- 2022 Stillwater Street-**ACTION**
- MNDOT SP 8282-145-**ACTION**
- Northern Natural Gas-**INFORM**

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: Basin is 95% constructed, made partial payment to the contractor. Preliminary planting was done last fall, final planting and minor punchlist items will be done in the spring. Coordination with Sustainable Stillwater for planting on June 1st. Alum treatment monitoring plan has been finalized. Alum treatment scheduled for May 18th.

Staff: Bryan Pynn-WCD; Matt Downing-MSCWMO

Lake St. Croix Small Communities Phosphorus Reduction Grant – PHASE II

Description: \$158,000 grant for stormwater quality improvement south of Bayport (2021-2023). Implement practices in the LSCD South SWA area to achieve a load reduction of up to 7lbs of TP/yr.

Activities This Month: WCD has completed final design and bid packet will proceed with RFP following board approval at May meeting. All landowner agreements have been signed and construction targeted for this fall.

Staff: Bryan Pynn - WCD; Matt Downing - MSCWMO

3M PFAS Settlement MPCA Staff Reimbursement Grant

Description: Up to \$40,000 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: No updates since last meeting. Grant will end in June.

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Staff: Matt Downing, MSCWMO; Stu Grub, EOR

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.

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: Equipment is being deployed in field to monitor flow at three sites. Lake monitoring has begun with the first sample being collected on Lily and McKusick. Lake elevation gages have been set and surveyed in Lily and McKusick Lakes. The 2021 Water Monitoring Summary is complete and ready for Board review. A presentation will be given to the Board.

Staff: Rebecca Oldenburg, WCD; Erik Anderson, 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: Spring reminder flyer and erosion control product vendor list was distributed to all known active sites to remind contacts to ensure measures are ready for spring rains. Wildlife friendly product recommendations were researched. Routine inspections are resuming.

Staff: Aaron DeRusha, WCD

BMP Maintenance

Description: The MSCWMO has a maintenance obligation for its Capital Improvement Projects and projects funded by Clean Water Fund grants. The MSCWMO partners with the Washington Conservation District to fulfill this maintenance requirement.

Activities this Month: Site visit and planning for the Stillwater Country Club occurred. Inlet was found still frozen so cleanout was delayed. Oak Park Heights Area D inlet cleanout occurred.

Staff: Cameron Blake, WCD

Erosion and Sediment Control Inspection, BMP Project, and Plan Review Database

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Description: The MSCWMO has partnered with WCD to develop a new erosion control inspection, BMP project tracking, and project plan review applicant database via ESRI's ArcGIS Online. The database will increase efficiency of erosion control and BMP project reporting, the application process for project plan reviews, and serve as a replacement to the current Mapfeeder software.

Activities this Month: Licenses have been renewed and a presentation on the final product will be given at the June meeting.

Staff: Rebecca Nestingen, WCD; Aaron DeRusha, WCD

Small Scale Habitat & Water Quality Enhancement Projects

Description: The MSCWMO has requested Conservation Corps crew time under FY22 Clean Water Funding to support small-scale habitat and water quality enhancement projects in 2022. Projects will include a vegetative buffer enhancement along Perro Creek in Bayport, a 215-foot buffer expansion between Riviera Avenue S and the St. Croix River in Lake St. Croix Beach, and a dune/floodplain enhancement along the St. Croix in St. Mary's Point. The MSCWMO has partnered with WCD to develop proposals for each project.

Activities This Month: Contract with Saint Mary's Point has been executed and work will commence when flood waters recede. Site prep for Lake St. Croix Beach will begin once MCC Crew time is finalized.

Staff: Brett Stolpestad – WCD

Meetings

- Washington County/WMO Coordination – March 15th
- WCD/WMO Coordination Meeting – March 18th
- LSC Steering Team – March 23rd
- Park Dental – March 29th
- Saint Mary's Point Council Meeting – April 5th
- LSC Steering Team – April 12th
- Perro Creek Stormwater Retrofits – April 27th
- LSCB/WMO Coordination – May 6th