Michigan State University

Phase II NPDES Stormwater Progress Report

Covering the Period

May 2016 to December 31, 2020

Submitted to the

Michigan Department of Environment, Great Lakes and Energy

April 1, 2021

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General Information and Regional Stormwater Management

This progress report is being submitted by Michigan State University (MSU) in partial fulfillment of the requirements of the Phase II Stormwater National Pollutant Discharge Elimination System (NPDES) Permit No. MI0059342. The permit allows for discharges from a municipal separate storm sewer system (MS4). The Michigan Department of Environment, Great Lakes and Energy (EGLE) requires that a progress report be submitted on the implementation status of the current permit. Though progress reports are typically completed every two years, an error within the previous permit issued in 2013 did not account for delays in reissuance and therefore required reporting up to, not after, 2016. As such, this progress report will account for a longer reporting period between May 2016 and December 31, 2020.

MSU is working to meet its permit requirements by implementing campus-based stormwater management activities and collaborative activities with other communities within the Greater Lansing urbanized area. The regional and campus-based frameworks for these activities are described below.

Greater Lansing Regional Committee (GLRC)

The Greater Lansing Regional Committee (GLRC) for Stormwater Management is a guiding body comprised of participating Phase II communities within the Greater Lansing Region. The committee has been established to guide the implementation of the Phase II Program for the communities within three identified urbanized watersheds: the Grand River, the Red Cedar River and the Looking Glass River watersheds.

GLRC Background

Beginning in November 1999, nine communities and three counties in the Greater Lansing Area organized to discuss the Federal Regulations for the Stormwater Phase II Program. The result of this organization was an agreement to pool resources on a regional basis to fulfill the requirements of the program. Initially, based on 1990 census population data, these nine communities and three counties were the only entities in the Greater Lansing Area that were designated to participate in the Phase II "Voluntary Permit Program" by the Michigan Department of Environmental Quality, now Department of Environment, Great Lakes and Energy (EGLE). Following several meetings of this group during late 1999 and early 2000, a resolution was drafted to establish the "Greater Lansing Area Regional NPDES Phase II Stormwater Regulations Committee" and representatives from each jurisdiction were named to serve on the committee.

Soon after the organization of the committee in 2000, the Tri-County Regional Planning Commission (TCRPC) began to assist the committee in providing contractual, fiduciary, and administrative support. Tetra Tech was selected to produce a permit strategy study, and later to prepare the Voluntary Grant Permit Applications for each community. Again in 2002, Tetra Tech was retained to prepare watershed management plans (WMPs) for the Grand River and Red Cedar River watershed areas, and would later prepare a WMP for the Looking Glass River watershed area.

Based on the increased population data following the release of the 2000 Census, ten additional communities were designated to meet the stormwater MS4 requirements under Federal and State regulations. Ultimately, seventeen communities and the three counties agreed to participate in a regional approach until April 30, 2008. Most recently the GLRC's Memorandum of Agreement (MOA) was updated to align with the current permit cycle. The updated MOA was adopted by GLRC members and

therefore establishes the GLRC legally through April 30, 2022. There are also a number of interested parties that are consistently involved with the planning activities associated with this program such as park, conservation districts, utility authorities, and transportation authorities. The participating communities recognize the substantial benefits that can be derived through cooperative management of the watersheds and achieve the MS4 permit requirements.

GLRC Members

The participating MS4 entities that currently make up the GLRC are as follows:

- City of DeWitt
- City of East Lansing
- City of Grand Ledge
- City of Lansing
- City of Mason
- Delhi Charter Township
- Delta Charter Township
- DeWitt Charter Township
- Lansing Charter Township
- Meridian Charter Township
- Lansing School District
- Waverly Community Schools
- Clinton County
- Clinton County Road Commission
- Eaton County
- Ingham County
- Michigan State University

GLRC Organization

Within the GLRC, a number of committees have been established to guide various components of the MS4 program. Other committees may be established as needed throughout the course of the program. A list of the committees including a brief description of their responsibilities follows.

2020 GLRC Organization

A list of the GLRC committees including a brief description of their responsibilities follows.

Executive Committee
The GLRC Executive Committee is comprised of a maximum of eight voting members consisting of the Chair and Vice Chair of the GLRC, one representative from each of the three counties, and the chairs of the Illicit Discharge Elimination Program (IDEP)/Post-Construction Committee, Public Education Program (PEP) Committee, and Total Maximum Daily Load (TMDL) Committee. The Executive Committee meets five times a year and the Full Committee meets twice a year.

Public Education Program (PEP) Committee
The PEP Committee guides the overall public education, participation, outreach, and involvement process. This also includes evaluation of the program and assessment of public knowledge and activities.

Illicit Discharge Elimination Program (IDEP) / Post-Construction Committee
The IDEP/Post-Con Committee guides the organization and implementation of the Illicit Discharge Elimination Program, mapping guidelines, field-sampling protocols, and how the watershed will be monitored for progress, as well as advises on matters regarding Post-Construction measures. The Committee has reviewed and provided recommendations related to pet waste reduction techniques, septic tank maintenance issues, staff training, as well as channel protection and TSS removal practices.

Total Maximum Daily Load (TMDL) Committee
Makes recommendations regarding the Grand River and Red Cedar River E. coli Total Maximum Daily Load (TMDL) requirement. The committee provides education and updates to GLRC members to assist in the development and implementation of TMDL programs.

Watershed Partnerships and Related Efforts

Middle Grand River Organization of Watersheds (MGROW)
MGROW is an outgrowth of the Grand River Expedition 2010, founded in 2011 and established as a 501c3 in February 2012. MGROW is striving to bring together local communities, watershed groups and other stakeholders in the Middle Grand River Watershed to build a greater understanding of and stewardship for our water resources. MGROW's mission: *To protect and preserve the history and the natural resources of the Middle Grand River Watershed by promoting education, conservation, restoration, and wise use of watershed resources.* While the Upper Grand River Watershed Alliance (Jackson area) and the Lower Grand River Organization of Watersheds (or LGROW, in the Grand Rapids area) assist local watersheds in their respective regions, serving as umbrella organizations to network and share ideas with local watersheds, the Middle Grand River Watershed has been without such support until the formation of MGROW. Local watersheds and program administrators in the MGROW area include: Friends of the Looking Glass River; Friends of the Maple River; Friends of the Red Cedar; GLRC; local conservation districts; Michigan State University Institute of Water Research (MSU-IWR); TCRPC and Mid-Michigan Environmental Action Council (Mid-MEAC). These groups have been operating independently from one another but have been exploring avenues for collaboration.

The GLRC Coordinator continues to work with MGROW to identify collaborative opportunities related to education, recreation and monitoring and the GLRC Coordinator serves on the board of MGROW. Visit http://www.mgrow.org/ for more information on this valuable partner.

Water Trail Planning/Grand River Partnership
The GLRC Coordinator assisted MGROW with the development of the DNR designated Middle Grand River Water Trail and associated materials, with the goal of inspiring new watershed stewards through recreation. The GLRC Coordinator also participates in the Grand River Partnership, a group composed of LGROW, MGROW, and Upper River Watershed Alliance who work together to promote watershed wide educational opportunities, collaborate on watershed protection, and collaborate on a headwaters to Lake Michigan paddle trail planning effort. Most recently, the group led the planning effort for the (since postponed) 2020 Grand River Expedition and are planning for virtual/socially distant opportunities to engage residents in watershed-based activities in 2021.

Looking Glass River Watershed Efforts

Friends of the Looking Glass River Watershed Council host local paddling events and log jam clean ups. The GLRC partners on related events and activities to promote recreation and awareness of the river. In late 2020, a surge of new members and leaders have inspired new activity and programming. The GLRC has met with leadership to discuss the role of the GLRC, the two group's history of partnership, and the educational resources available at GLRC. The GLRC has also submitted letters of support for grant proposals seeking to establish river clean up events for citizens of the watershed. The two groups are currently exploring further opportunities for partnering.

Red Cedar River Watershed Efforts

In 2019, the Friend of the Red Cedar River formed and brought a stakeholder group of river residents, paddlers, and governments together to promote watershed stewardship and recreation. The GLRC Coordinator assisted the group with early organizational efforts and provided guidance on Red Cedar River water trail effort with the goal of inspiring new watershed stewards and educational opportunities through water-based recreation.

Maple River Watershed Efforts

While outside of the urban area, the GLRC partners with Maple River stakeholders in their watershed planning efforts. The GLRC Coordinator sits on the Upper Maple River non-point Source Steering Committee as well as the Stony Creek Planning Project, a tributary of the Maple.

Dam Removal Exploratory Group

The GLRC Coordinator participates with a group of watershed stakeholders exploring feasibility of removing Lansing's two dams, advising on possible green infrastructure solutions to post-removal riparian restoration.

Smart Management of Microplastics Pollution

Smart Management of Microplastic Pollution in the Great Lakes is an initiative aimed at reducing microplastic pollution in communities surrounding the Great Lakes. Based out of Wayne State University, the project team selected two communities (Williamston and Pontiac) to pilot projects aiming to monitor, detect, and reduce microplastics in stormwater runoff and drinking water. The GLRC Coordinator is on the Steering Committee and assists with the development of outreach efforts.

Capital Area Sustainability Partnership

In 2021, a group of regional stakeholders began meeting to discuss sustainability and climate change planning efforts. The GLRC Coordinator, through the capacity of planner at the Tri-County Regional Planning Commission, has assisted in the facilitation of these regional discussions and helped include stormwater management as a focus of these conversations. The GLRC Coordinator has also leveraged GLRC connections to bring watershed partners into this planning effort.

IMPLEMENTATION COMMITTEE ACTIVITIES

Public Education Program (PEP) Committee

The PEP Committee met on the following occasions:

April 26, 2017
August 10, 2017
March 21, 2018
May 22, 2018
October 22, 2018
May 17, 2019
November 23, 2020
January 20, 2021

Committee Activities:
The PEP Committee has developed a variety of educational materials and implemented a number of outreach activities that are described in detail in the Public Education Plan later in this report. In addition to those activities, the committee has worked on the following:

Regional Water Quality Survey – As stated in previous progress reports, the survey results continue to be used as a tool for the PEP Committee regarding all educational efforts and public participation. Surveys were conducted in 2006, 2012, and 2018. The surveys provide comparison data; demonstrating where we have made progress through our educational efforts and identifying areas that need improvement. This is used to craft and evaluate the success of the PEP BMPs. The survey results can be found on the GLRC website here: http://mywatersheds.org/resources/publications/

GLRC Annual Report – The first GLRC Annual Report was developed in early 2012 (reporting on 2011). The intent of the report is for GLRC members to share it with their boards, councils, and commissions in order to demonstrate the work that has been done throughout the year. TCRPC also shares the report with TCRPC Commissioners, subscribers to our newsletter, and on the website. The effort continues with reports developed through 2021 (reporting on 2020).

The following table indicates the annual report mailing to the GLRC newsletter subscriber list. These recipient numbers reflect members of the public who have volunteered to receive these updates, not partner/governmental contacts. This list has seen consistent growth.

Edition	Date Sent	Number of Recipients
2017	2/23/2018	44
2018	2/7/2019	150
2019	1/31/2020	275
2020	1/26/2021	525

GLRC Quarterly Newsletters – The GLRC began publishing quarterly newsletters in January 2010 and continues to do so. The newsletters are posted on the GLRC and TCRPC websites and are shared through an email distribution list of over 500 stakeholders. It is recommended that GLRC members share the

newsletters with elected officials and appropriate boards, councils, and commissions.

Edition	Date sent	Number of Recipients
Fall 2017	11/1/2017	42
Winter 2018	2/23/2018	44
Spring 2018	4/20/2018	52
Summer 2018	7/23/2018	77
Fall 2018	10/31/2018	95
Winter 2019	2/7/2019	150
Spring 2019	4/29/2019	175
Summer 2019	7/17/2019	200
Fall 2019	10/28/2019	200
Winter 2020	1/31/2020	275
Spring 2020	5/11/2020	294
Summer 2020	7/16/2020	300
Fall 2020	10/21/2020	305
Winter 2021	1/26/2021	525

General Outreach/Education Efforts – The GLRC Coordinator partners with several different groups, agencies, and organizations in the region. Here is a summary of general collaboration and activities related to stormwater and pollution prevention:

- Red Cedar Awareness – In response to the discovery that a river-front MSU fraternity was dumping their garbage into the Red Cedar, and group of stakeholders began meeting to explore ways to engage the student and Greek communities as well as apartment complex owners. Part of that effort resulted in a MSU football gameday initiative led by the GLRC, MGROW, and Mid-MEAC. In fall of 2017, volunteers walked through the tailgate area and gave away swag items in exchange for signing a trash pick-up pledge and distributed refrigerator magnets with pollution prevention information that were purchased by the GLRC.

- East Lansing Dog Swim – Prior to closing the pool at the East Lansing Aquatic Center for the 2017 season, the city opened up the pool for a dog swim. The GLRC Coordinator attended and traded the GLRC's dog waste bags in exchange for signing a pledge to scoop. 57 pledges were signed/bags distributed. Pens and GLRC stickers were also distributed.

- MWEA Watershed Committee – GLRC Coordinator has been attending all MWEA Watershed Committee meetings and provided some support to the group related to the MS4 permit application process. This is a good networking opportunity for the GLRC to share our experiences and learn what others are doing around the state. This group plans the Watershed and Stormwater summits, which the GLRC coordinator has presented at.

- December 2017; 2018; 2019 – Promoted annual MWEA Stormwater Seminar. GLRC Coordinator attended. *The event didn't occur in 2020, and no GLRC Coordinator was in place in December 2016. MSU representatives participated in these seminars.

- March 2017, March 2018; March 2019; and July 2020* – GLRC display was on exhibit at the MWEA Watershed Summit. *The 2020 event was moved to a digital format due to Covid-19. The GLRC exhibited virtually, giving a brief presentation on the group to the audience. MSU representatives participated in these summits.

- March 2018, 2019, February 2019 – Promoted and exhibited at the Quiet Water Symposium. *GLRC Coordinator volunteered at the 2017 QWS, having been hired after the deadline to be able to exhibit.

- November 2018 – donated over 100 brochures, stickers, and bracelets to a local foster care center for children.

- April 2019 – donated 30 Rain Garden Seed Cards to a meeting of the Dimondale garden club.

- April 2019 – Provided letter of support to the Eaton County Conservation District for a Consumers Energy Grant aimed at watershed planning effort.

- May 2019 – donated bracelets, stickers, and brochures to local foster care center for children.

- July 2019 – Donated 35 each of green infrastructure brochures, watershed brochures, bike maps, stickers, and rain garden seed cards for an Allen Neighborhood Center Rain Garden class.

- July 2019 – Provided letter of support and assistance to Mid-MEAC for Great Lakes Commission Green Infrastructure Mentor Grant. Mid-MEAC/GLRC was partnered with a peer stormwater group in New York who shared their outreach materials and strategies.

- June 2020 – Provided letter of support for a MSU green infrastructure/stormwater tree grant application.

- The GLRC Coordinator has consistently provided notices to GLRC members regarding anything relevant to the MS4 program including seminars, training, webinars, legislative updates, etc.

- The GLRC continues to promote the Mid-Michigan Environmental Action Council's stream monitoring programs. The GLRC Coordinator also participated in the 2018 volunteer monitoring event. The GLRC reached 96,407 area residents through social media promotion of these events during the reporting period.

IDEP Committee/Post-Construction Committee

*Beginning in 2020, the GLRC reconvened the Post-Construction subcommittee and combined it with the IDEP subcommittee. The Committee met multiple times to focus on the challenges facing Post-Construction implementation.

All GLRC members are well into implementation of their individual IDEP programs. The GLRC Coordinator continues to work with regional partners on watershed protection efforts focused on pollution prevention and Illicit Discharge Elimination.

The GLRC developed a reporting page on MyWatersheds.org to more easily advertise the contact information for reporting illicit discharges to member communities. MyWatersheds.org/REPORT is easy to remember and promote. A Septic Smart webpage was also developed to educate residents on reducing illicit connections to the storm sewer. But the primary focus of this committee has been staff training.

Committee Activities:

IDEP Training Video –

Group Training: The GLRC hosts training video viewings for members and their staff. During the reporting period, two training dates were held: May 8, 2018 and May 10, 2018. MSU purchased a copy of the training video for in-house training, and thus did not participate in these group trainings.

The GLRC also hosted two field trainings for outfall screening. MSU representatives attended those training sessions.

TMDL Committee

The TMDL Committee provides a forum for discussing TMDL implementation. In summer of 2020, the committee developed a Quality Assurance Project Plan (QAPP) to standardize sample collection and guide field operations related to wet weather monitoring. Members have individual TMDL implementation plans but utilize the QAPP to inform project managers and field staff of laboratory requirements and options for analysis.

Other GLRC Activities

Good Housekeeping Training - The GLRC hosts training video viewings for members and their staff. During the reporting period, two training dates were held: May 8, 2018 and May 10, 2018. MSU purchased a copy of the training video for in-house use, and thus did not attend these training sessions.

GLRC Stormwater Seminar – In June 2018, the GLRC held an educational seminar for members to learn about a variety of topics, including stormwater utilities, impervious surface mapping, GSI site plan reviews, and NJDEP performance standards. Thirty five people attended, including a representative from MSU. A second GLRC Seminar was planned for 2020 but was postponed due to Covid-19.

EGLE Industrial Stormwater Operator Training – The GLRC planned to host EGLE for an Industrial Stormwater Operator Training in 2020. It was postponed due to Covid-19 restrictions. EGLE offered options for license applications and renewals online. The MSU Stormwater Committee includes an Industrial Stormwater Operator.

Ingham County Surface Water Program -- The Ingham County Health Department regularly tests sites for *E.coli* and have done so through this program for 15 years. Several Ingham County based GLRC members support this effort and in 2021 applied for a grant to expand the program to different sites and explore feasibility of similar programs throughout the Middle Grand River watershed. If funded this grant would also support the development of a water quality database to house current and historical sampling results and educate the public about the E. coli TMDL. MSU is a member of this program.

Recreation Efforts
The GLRC promotes partner efforts and recreational events through the website and social media, like paddling expeditions and races and other opportunities for residents to connect to our watershed and water resources. The GLRC understands that residents will be more likely to adopt pollution prevention strategies if they use and love the resources those actions would protect.

Green Infrastructure Code Audit – The GLRC Coordinator worked with Meridian Township to audit their codes and ordinances for barriers to green infrastructure implementation. In 2020, the Committee agreed to reconvene the GLRC Ordinance Committee to develop a GSI Ordinance Manual for area communities interested in similar audit exercises. The document will provide model ordinances and language to standardize and improve the region's landscape and surfacing requirements in a way that promotes the use of green infrastructure. This effort will develop in 2021. GSI Code Audits at other GLRC members will resume after the manual is complete.

Coal Tar Seal Coat – The GLRC also tasked the Ordinance Committee with assisting area communities in the development of coal tar seal coat bans. The Committee will work to develop a resource guide and model ordinances/programs in an effort to standardize the region's approach to these contaminants.

Michigan State University Stormwater Management Program (SWMP)

Stormwater is managed on the MSU campus by a team of faculty, staff and students representing a broad cross-section of the University. Units and Departments that are playing a role in managing stormwater runoff and implementing the University's Stormwater Management Program (SWMP) include the Office of Environmental Health and Safety (EHS), IPF Planning, Design and Construction (PDC), IPF Landscape Services, IPF Power and Water, Land Management Office, MSU Sustainability, Residential and Hospitality Services, Institute of Water Research, MSU Police, Department of Community Sustainability, Department of Biosystems and Agricultural Engineering, and Department of Horticulture.

A Stormwater Committee comprised of representatives from a subset of these units and chaired by the by IPF Planning Design and Construction Director John Lefevre. The committee meets monthly to oversee SWMP activities and to direct additional campus-based stormwater activities. A list of University representatives responsible for carrying out SWMP duties (including a list of Stormwater Committee members) is included in **Appendix A**.

<u>Stormwater Management Program Components</u>

The following are required components of the SWMP:

Public Education Plan (PEP), to promote, publicize, and facilitate education for the purpose of encouraging the public to reduce the discharge of pollutants to stormwater to the maximum extent practicable.

Public Participation/Public Involvement (PPP), to share components of the SWMP and encourage participation in its review and implementation

Illicit Discharge Elimination Program (IDEP), to detect and eliminate illicit connections and discharges to the MS4.

Post Construction Stormwater Runoff for New Development and Redevelopment Projects, to address post-construction stormwater runoff from projects that disturb one acre or more, including projects less than one acre that are part of a larger common plan of development that would disturb one acre or more.

Construction Stormwater Runoff Control, to augment Part 91 rules dealing with soil erosion, offsite sedimentation and other construction-related wastes.

Pollution Prevention and Good Housekeeping Program, to minimize pollutant runoff to the maximum extent practicable from municipal operations that discharge stormwater to the surface waters of the state.

Public Education Plan and Public Participation

The MSU Stormwater Public Education Plan (PEP) seeks to promote, publicize, and facilitate watershed education for the purpose of encouraging the public to reduce the discharge of pollutants in stormwater to the maximum extent practicable. The PEP has been developed to ensure that the targeted audiences are reached with the appropriate messages for the following topics:

1. *Promote public responsibility and stewardship in the applicant's watershed(s).*
2. *Inform and educate the public about the connection of the MS4 to area waterbodies and the potential impacts discharges could have on surface waters of the state.*
3. *Educate the public on illicit discharges and promote public reporting of illicit discharges and improper disposal of materials into the MS4.*
4. *Promote preferred cleaning materials and procedures for car, pavement, and power washing.*
5. *Inform and educate the public on proper application and disposal of pesticides, herbicides, and fertilizers.*
6. *Promote proper disposal practices for grass clippings, leaf litter, and animal wastes that may enter into the MS4.*
7. *Identify and promote the availability, location, and requirements of facilities for collection or disposal of household hazardous waste, travel trailer sanitary wastes, chemicals, yard wastes, and motor vehicle fluids.*
8. *Inform and educate the public on proper septic system care and maintenance, and how to recognize system failure.*
9. *Educate the public on, and promote the benefits of, green infrastructure and Low Impact Development.*
10. *Identify and educate commercial, industrial, and institutional entities likely to contribute pollutants to stormwater runoff.*

As required by the stormwater permit, the GLRC PEP Committee prioritized the public education topic areas into high, medium and low categories. Many factors were considered in this process including survey results, available resources, cost effective outreach methods, existing public knowledge levels and potential for collaborating with other programs currently underway.

High priority topics areas include:

- *Inform and educate the public about the connection of the MS4 to area waterbodies and the potential impacts discharges could have on surface waters of the state.*

- *Educate the public on illicit discharges and promote public reporting of illicit discharges and improper disposal of materials into the MS4.*

- *Educate the public on, and promote the benefits of, green infrastructure and Low Impact Development.*

The following PEP activities were undertaken by MSU and the GLRC during the period May 2016-December 31, 2020. Activities in the PEP include those that are watershed-wide and thus implemented in partnership with the GLRC as well as activities planned and implemented solely on the MSU campus.

Pollution Isn't Pretty (PIP) - Originally funded by TCRPC's Mid-Michigan Program for Greater Sustainability, MGROW has facilitated the use of the water resource education campaign titled: Pollution Isn't Pretty. The PIP campaign was professionally designed and is being used consistently across the region. The campaign is currently owned and housed by MGROW. In late 2020, an error at the web hosting firm caused the web content to be deleted, and MGROW offered to redirect the website to the GLRC's website. Now, existing materials, including the roughly 250 pet waste trail signs throughout the region, will direct to the GLRC's "For Residents" page. The GLRC will continue to financially maintain the Pollution Isn't Pretty domain. Partners from throughout the watershed, including the GLRC, distribute materials from this campaign and with the domain. See: http://www.pollutionisntpretty.org

The following GLRC members have placed the Pollution Isn't Pretty signs in their communities: Lansing Charter Township (3), City of East Lansing (20), Ingham County Parks (5), Clinton County Parks (2), DeWitt Charter Township (3), Meridian Charter Township (4), City of Lansing (5), City of Grand Ledge (4), and MSU (1). Several signs have also been placed on the Lansing River Trail.

Watershed Signage – With the help of local road commissions, signage was placed along roads to indicate watershed boundaries to passing vehicles, cyclist, and pedestrians. These were installed between 2005-2006 but are maintained indefinitely.

In 2017, MSU contracted with a graphic artist to refresh and rebrand its stormwater-related outreach materials, including signage. A new watershed sign was installed at the Farm Lane Bridge:

GLRC Exhibit Display – The traveling exhibit display was developed in 2008 and has been used extensively at local workshops, conferences, community lobbies, etc. When the display is not being used for a special event, it travels throughout the region at GLRC member offices. The GLRC display panels were redesigned in 2014 to incorporate the PIP campaign, and in 2017 a scroll style "pop up" banner was developed that could be utilized in more places, like outdoor events. It was designed with a header titled "We All Live in a Watershed" in order to address survey results that indicate many residents don't know that they live in a watershed. In 2019's Public Education Plan update, most GLRC members agreed to display the scroll style banner in their lobbies (or other public place, such as a library) for 2-3 weeks each year*. Multiple communities purchased their own scroll banners to display for longer periods. In addition to the display itself, copies of GLRC publications and watershed brochures are handed out to interested parties. *Due to the Covid-19 pandemic, display use at lobbies and public events was temporarily replaced with digital PEP BMPs, per the GLRC PEP Amendment submitted in summer 2020.

Enviroscape – In late 2017, the GLRC purchased an Enviroscape watershed model, a hands-on, interactive demonstration of the sources and impacts of stormwater pollution. It is utilized at events where time and setting allow. The GLRC also frequently partners with EGLE at events and utilizes their interactive floodplain model. The GLRC displays and Enviroscape unit have been utilized by the GLRC Coordinator and members.

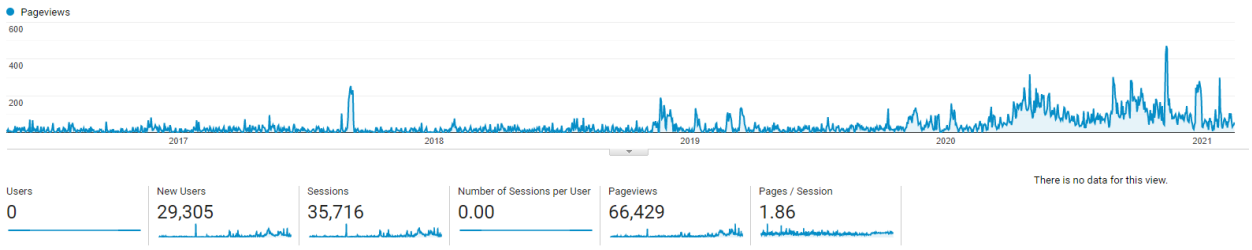
MSU Displays – The University developed three new displays during this reporting period, to match its rebranded outreach materials. These include a large table-top display panel, a smaller tri-fold display for use in outdoor settings and a telescoping display to use during events where space is limited. The MSU-specific displays were used at a number of events during the reporting period. These include:

- Autumnfest - November 2016, 2017, 2018 and 2019 (estimated 700 attendees per year)
- Grandparents University in June 2016, 2017, 2018 (50 attendees per year)
- MWEA Watershed Summit – March 2016, 2017, 2018 (app. 75 attendees per year)
- MSU Sustainable Business Student Forum – March 2019 (40 attendees)
- MSU Science Festival – March 2019 (30 attendees)
- MSU-Penn State Football Game (along the Red Cedar River) – October 2019 (est. 300 interactions)
- MSU Women's Basketball Sustainability Day – November 2019 (est. 100 interactions)

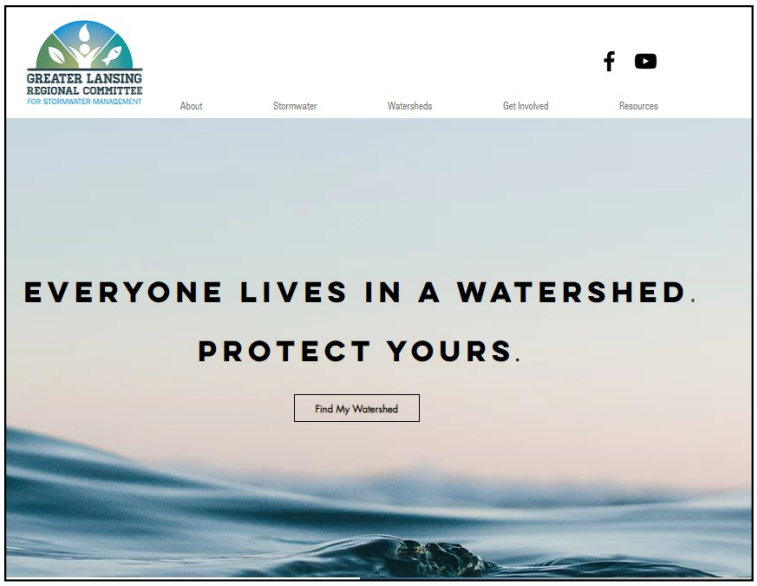
GLRC Website www.mywatersheds.org – The public website for the GLRC is maintained and updated on a regular basis. The website includes a significant amount of information relating to watersheds, stormwater stewardship, GLRC reports, educational information, links to other environmental organizations and much more. All public education outreach materials direct the viewer to our website so we can further educate them about pollution prevention. The website was updated in the spring of 2017 and again in 2020. The most recent update was driven by survey data. Survey results indicated that many residents do not realize they live in a watershed, prompting the GLRC to include "EVERYONE LIVES IN A WATERSHED" as the home page header as the first thing visitors see. Results also indicated that residents prefer learning about environmental issues from videos, prompting the GLRC to create and embed a suite of videos within the homepage.

The PEP Committee reviews the website stats on a regular basis. There have been nearly 42,000 total hits on the website since its 2017 redesign, as indicated by the "ticker" at the bottom of the webpage. Google Analytics show a total of 63,549 page views and 28,315 users within the Progress Reporting period, including usage spikes surrounding the 2017 and 2020 website redesigns. There has been a significant increase in website traffic with the new website re-designs and our continued multimedia approach. These demonstrate that our efforts to appeal to wider audiences have been successful.

- May 2016 – December 2016: 1,600k page views
- 2017: 6,150 pageviews
- 2018: 7,171 pageviews
- 2019: 9,977 pageviews
- 2020: 37,031 pageviews

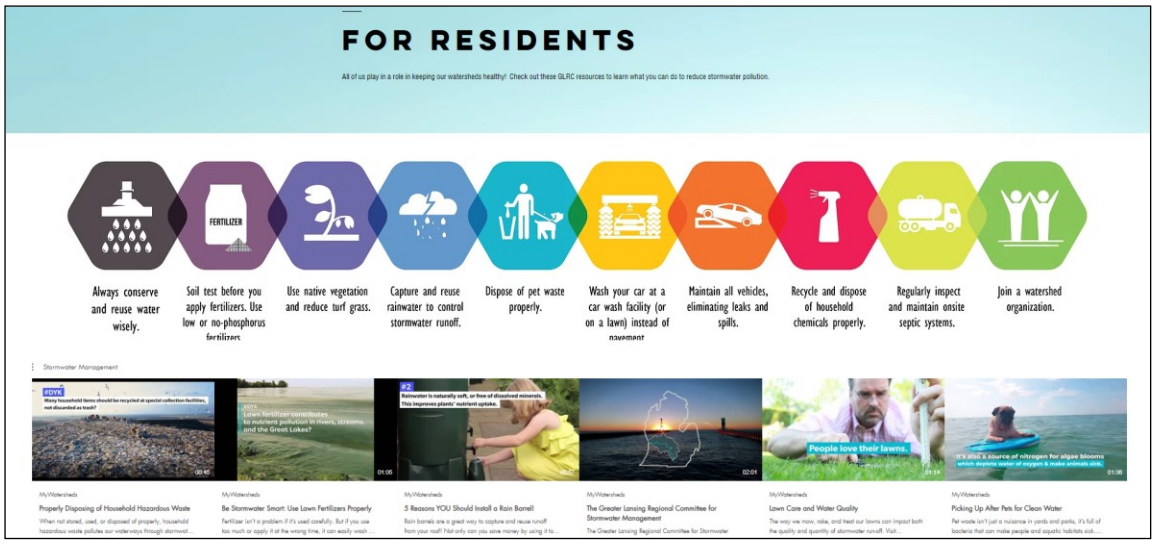


The committee also tracks traffic to individual pages to monitor the strength of individual pages and interpret what information resonates well. Since the 2017 redesign, our "Rain Garden 101" page is by far the most popular. More planting guides and suggestions were added to supplement this page based on this feedback. Our "Stormwater Basics" and "What's a Watershed" pages received a total of 10,298 visits during the reporting period.



Subpages --

For Residents Webpage – This page was developed on the website to allow GLRC members and the public to review files for education purposes. These files include brochures, posters, articles, seasonal tips, and other information to educate residents on stormwater pollution prevention. Per survey results, an emphasis is placed on video content and it is located near the top and in focus. Previous iterations were titled "For Homeowners" but that was determined to be too limiting. All residents, not just homeowners, can play a role in watershed protection.



For Educators Webpage – The PEP Committee maintains a webpage on the GLRC website for educators in the region. The page serves as a resource guide for local teachers, workshop leaders, or anyone interested in environmental education. State and federal environmental curriculum is highlighted as well as links to lesson plans. It includes resources and example projects that the schools can integrate into their current activities.

The webpage also serves as a toolbox for teachers and school district officials that are required to meet MS4 permit requirements. This page continues to be updated on a regular basis. At the beginning of the Covid-19 pandemic, this website was updated with multiple at-home-learning lessons to assist parents and teachers with finding lessons and activities suitable for remote learning.

For Members Webpage – The GLRC developed a For Members webpage in 2019 to house relevant documents and information for municipalities. There is particular focus on making it easier to view and use digital PEP materials and request physical resources for outreach events.

Be Septic Smart Webpage – The GLRC developed a septic focused webpage to house info on septic systems, time of sale programs, and our septic focused video.

Rain Garden 101 – Our most popular webpage, Rain Garden 101 includes manuals, videos, and planting resources to help homeowners plan and install their own native plant rain garden. It was developed and continuously improved during this reporting cycle. GSI focused webpages received over 16,000 views during the reporting period.

Local Green Infrastructure Projects -- This page was added to highlight Lansing area GSI projects and includes the video clip developed as part of the Greening Mid-Michigan project. It has 270 views during the reporting period.

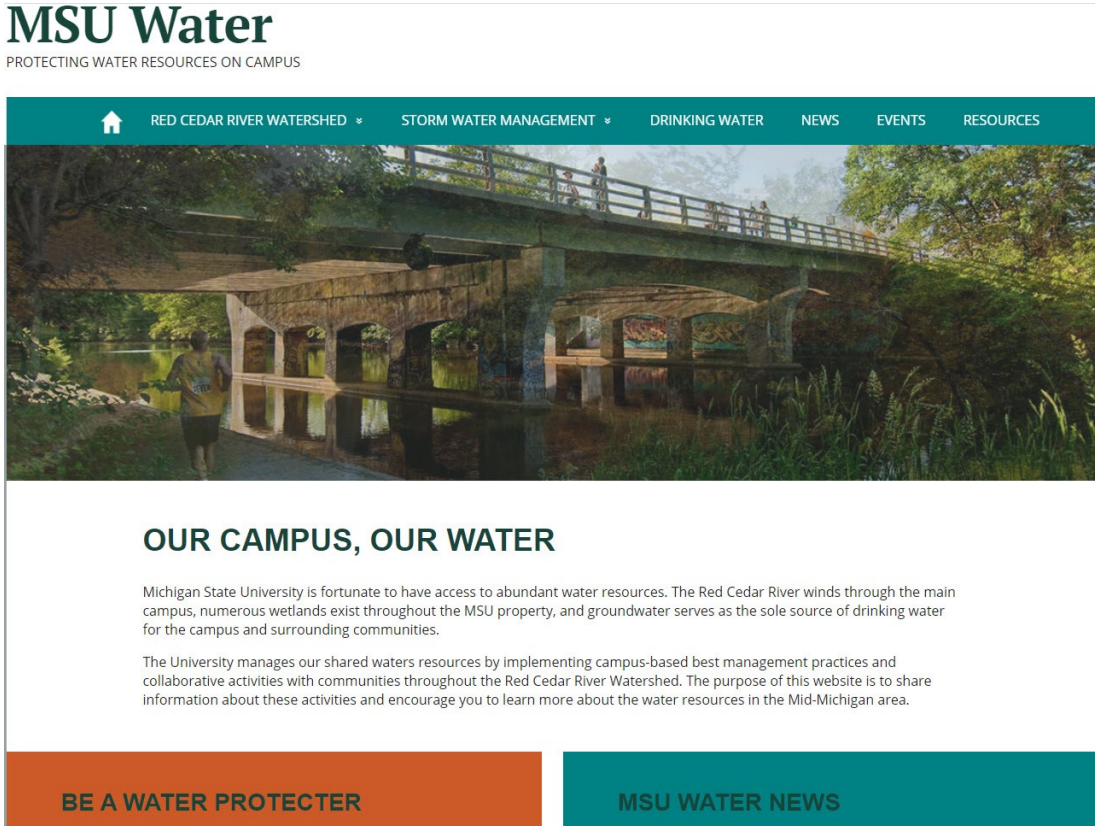
Household Hazardous Waste Calendar – Respondents to the GLRC survey indicated that they were not utilizing household hazardous waste sites because they didn't know where they were. In response, the GLRC created a webpage dedicated to these resources. It includes an event calendar and information on disposal in the tri-county area. This received 1,395 views during the reporting cycle.

Reporting Webpage – To simplify the GLRC's shared outreach efforts, MyWatersheds.org/REPORT was created to house the IDEP reporting information for all members. This allows the GLRC to easily promote a one-stop reporting resource to the region's residents in a simple, easy to remember domain. The IDEP and reporting webpages received a total of 379 visits during the reporting period.

Event Calendar– The committee is continuously updating the GLRC calendar with applicable meetings, webinars, educational opportunities, and recreation and cleanup activities throughout the watersheds.

MSU-WATER Website www.msu-water.msu.edu– the website includes information about the Red Cedar River, educational materials and links to the GLRC website and other stormwater-related sites. The website was redesigned in 2017 to match the rebranded outreach materials. The website includes who to contact: in case of spills http://msu-water.msu.edu/report-spills/; with questions about the University's Stormwater Management Program http://msu-water.msu.edu/what-is-storm-water/managing-storm-water-on-the-msu-campus/; and how to volunteer for activities http://msu-water.msu.edu/you-can-play-a-role-in-protecting-campus-water-resources/.

Google Analytics data show that in this reporting period, the website had more than 12,000 views, with a total of 10.266 new users. No spills were reported or inquiries made through the website; however, several students contacted the Stormwater Committee via the website asking about volunteer opportunities.



Website Mock Audits – The GLRC Coordinator continuously reviews members' websites and recommends improvements, and every GLRC member underwent a "mock audit" of their digital BMPs, starting in late 2017 through 2019. During these exercises, the GLRC Coordinator reviews municipal websites for PEP compliance and guides updates as needed to meet permit commitments.

Educational Articles – The PEP Committee continues to use and promote a series of news articles. They are posted on the GLRC website so GLRC members can easily access them to periodically include in their local community newspapers. They are also located in the "For Residents" page and included in each quarterly newsletter. The articles cover the following topics:

What is a Watershed?
Riparian Buffers
Car Washing Article
Adopt Your Catch Basin
Vehicle Maintenance
Septic System
Pet Waste and the Environment
Storm vs. Sanitary Sewer
Illicit Discharge
Safe Fertilizer Use
Wetlands: an Overview
Maintenance

The articles are updated periodically for content and design updates, most recently in 2020. The articles are available on the MSU-WATER website.

GLRC Media Toolkit – In fall of 2020, the GLRC developed a Media Toolkit for members and their communications staff. It was designed to clearly illustrate the content available for municipal newsletters, social media, and other outreach and provide "plug and play" language. Municipal communications staff often lack the technical knowledge or time to craft stormwater related content, but the Media Toolkit

features 71 pages of resources that they can pull from and customize to their needs. This reduces the barrier to frequent stormwater related outreach.

Press Releases – A suite of press release templates were developed in 2020. Covering Pet Waste, Soil Erosion, Industrial Facilities, and Dumpster/Trash BMPS, they are structured as customizable news articles for inclusion in community newspapers or municipal newsletters.

Adopt A River – The GLRC display was part of the environmental fair at the Adopt A River events held in May of 2016 through 2019. The 2020 Event was canceled due to the Covid-19 pandemic. The Enviroscape Watershed model was an activity added to make the public interaction more hands on. The GLRC was also included in the Passport, which encouraged participants to visit all booths of the environmental fair to be entered in a drawing for prizes, etc. Over 500 residents participate in this event each year.

MSU Science Festival – The MSU Science Festival is an annual month-long educational event hosted by Michigan State University. The GLRC participates in the Festival's EXPO Day, utilizing the Enviroscape Watershed model, handing out brochures, and speaking with children and families. EXPO Day draws 7,000 people each year, though it was cancelled in 2020 due to the Covid-19 pandemic. The GLRC participated in 2018 and 2019 and will continue to do so as the event returns.

GLRC Presentations – The following presentations were given by the GLRC Coordinator within the reporting period:

- May 24th, 2017: Presented new MyWatersheds.org website and materials to TCRPC Board of Commissioners.
- June 23rd, 2017: Interviewed by HOMTV. Discussed stormwater and pollution prevention.
- August 14th, 2017: Presented on stormwater/GLRC to the Lansing Exchange club, a local business and civic fraternal organization. Roughly 35 people attended.
- November 7th, 2017 – presented to local Brownies (Girl Scout) troop and used Enviroscapes Watershed exhibit.
- February 14th, 2018: Presenting on stormwater and GLRC to the TCRPC Program Committee (6 commissioners).
- February 28th, 2018: Presented on stormwater program and GLRC at TCRPC commission orientation (5 commissioners).
- April 23rd, 2018: Interviewed by HOMTV for Earth Day, providing an overview of Pollution Isn't Pretty and stormwater pollution prevention.
- May 19th, 2018: Presented to participants at Ingham Conservation District's rain barrel workshop. Provided overview of GLRC and stormwater pollution prevention. Roughly 20 participants were in attendance.

- June 27th, 2018: Participated at MSU's Grand Parent's University. Presented to two classrooms of grandparents and their grandkids on stormwater pollution prevention and watersheds. Passed out 50 rain garden seed cards to attendees.

- November 20th, 2018: Shared yearly GLRC highlights and annual reports with the East Lansing Commission on the Environment (9 commissioners).

- December 4th. 2018: Presented to MWEA's Stormwater Summit on the GLRC's digital PEP efforts. Roughly 125 people attended.

- February 7th, 2019: Guest speaker at the Eaton Conservation District Annual Dinner. Presented to 100 attendees about the GLRC and stormwater pollution prevention and hosted a trivia game with water-based questions.

- February 26th, 2019: Shared yearly GLRC highlights and annual reports with the East Lansing Commission on the Environment (9 commissioners).

- March 25th, 2019: Presented to audience at MGROW's annual meeting. Discussed GLRC and stormwater pollution prevention. Roughly 75 people attended.

- February 19th, 2019: Presented on stormwater program and GLRC at TCRPC commission orientation (6 commissioners).

- October 8th, 2019: Guest lectured two classes at Olivet College. Classes were 80 minutes each, covering the history of the Phase II program, the GLRC, and pollution prevention tips. The interactive Enviroscapes watershed model was utilized. 50 students total were in attendance.

- December 6th, 2020: Participated in MGROW's Wild and Scenic Film Festival, providing a 3 minute presentation between films about the GLRC, our website, and pollution prevention. 300 people were in attendance.

- Throughout 2020, the GLRC Coordinator attended most of Meridian Township's weekly Wednesday Environmental Networking meetings. Township residents interested in environmental issues meet for free-flowing discussion. The GLRC Coordinator provides regular updates on Committee activities to this group and helps connect them with regional resources.

MSU Presentations – Presentations about the Red Cedar River and MSU's stormwater management activities within the reporting period include:

- Oct. 2016 – SOC 869 Guest Lecture
- Aug. 9, 2017 – MDOT GSI at MSU
- Sept. 19, 2018 – EHS staff training
- March 25, 2019 – MSU Sustainable Business Forum
- May 10, 2019 – MSU Weir Removal Workshop
- May 26, 2019 – St. Thomas Aquinas School
- Sept. 24, 2019 – WEFTEC Conference (Chicago)
- Jan 21, 2020 – ESPP Guest Lecture

- Oct. 14 2020 – UG Honors Seminar Guest Lecture

Student Outreach – 500 copies of a poster emphasizing personal responsibility were printed for distribution in residence halls in 2018-2019. The poster is available on the MSU-WATER website: http://msu-water.msu.edu/you-can-play-a-role-in-protecting-campus-water-resources/.

MSU Green Stormwater Infrastructure Tours – Tours about MSU's stormwater program were conducted as follows:

- October 2016 – Water Moves MSU (Broad Museum event)
- April 2017 – MSU Science Festival
- Oct. 2017 and Oct. 2019 – Lake and Stream Leaders Institute
- Sept. 2019 – MSU Sustainability

Red Cedar River Clean-Up
An MSU Red Cedar River Clean-up event was held July 13, 2019. MSU IPF, Department of Fisheries and Wildlife, MSU Surplus Store and Recycling and Michigan United Conservation Clubs collaborated for this event. App. .66 miles of the Red Cedar River along East Michigan Ave. and Beal St. were cleaned, with volunteers collecting about 20 cubic yards of trash.

MSU Sustainable Stormwater Walking Tour
Walking tour signs and posters were updated to match the new branding in 2020, and will be available on the MSU-WATER website and posted in the campus displays in Summer 2021.

MSU Riverbank Restoration
A riverbank restoration project kicked off in 2018 along the walking and biking path adjacent to Spartan Stadium. Bioengineered Lifts were used to stabilize approximately 275' of the riverbank. This technique uses rock, natural materials, and native plants to reduce riverbank erosion, to reduce phosphorus and nutrient into the river. A second phase is planned for 2021.

GLRC Fact Sheet – A fact sheet describing the Phase II program and purpose of the GLRC was created in 2017 to help community leaders quickly understand the requirements of the program and how the GLRC helps meet them. This is distributed with annual reports, dues invoices, and to new TCRPC Commissioners to help those in leadership roles understand their municipality's responsibilities and the GLRC resources available to them.

Social Media – The GLRC joined Facebook and Twitter in December 2009. Regular posts/updates are related to watershed stewardship, public involvement, and participation. GLRC and partner events are also posted frequently. Currently 1,335 people "like" the GLRC on Facebook (an increase of since 1,176 since 2013) and we have 389 "followers" on Twitter (an increase of 74 since 2016). The committee places heavy focus on the use of paid advertising on Facebook to spread our messaging. These tools allow the GLRC to target residents within the urban area and ensure that we are reaching people who do not already interact with our page. Our reach and influence have grown tremendously since adopting this approach. Since May 2016, our posts have "reached" over 1.8 million times and resulted in almost 3.1 million impressions, all within the urban area due to geo-targeting. Purchasing ad space diversifies the placement of the outreach material as well. Our post are not limited to our page, but are displayed on Instagram, Facebook Marketplace, and in the sidebar of Facebook (in addition to the "News Feed."

The GLRC has committed to utilizing paid advertising from the central, shared GLRC account rather than commit to social media responsibilities of individual members. The paid posts cover each required PEP topic, and the GLRC has dedicated over $20,500 in funding to these paid educational promotions in the reporting period.

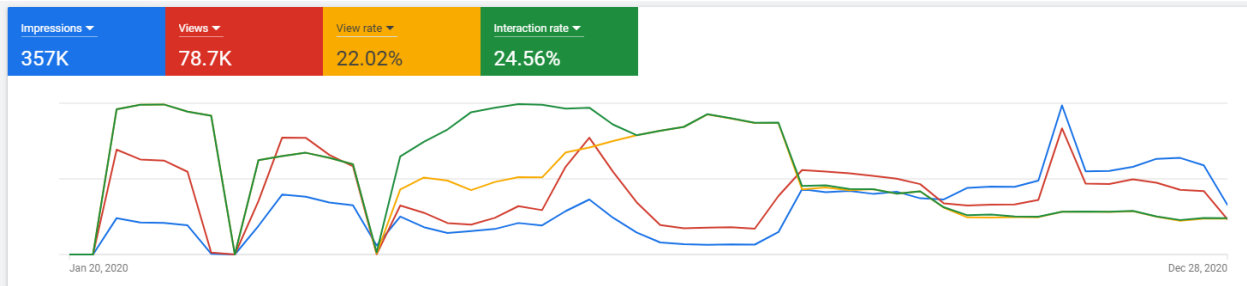
See our pages here: https://www.facebook.com/GLRC4stormwater/ and https://twitter.com/GLRC4stormwater.

YouTube -- Survey results indicated that respondents prefer learning about environmental issues through video. As such, the GLRC invested in a suite of videos for inclusion on the website, Facebook, and YouTube. One video is two minutes and explains the GLRC and basic stormwater pollution prevention, other videos cover the required PEP topics. Most topics have two videos: one that is roughly 60-90 seconds and one that is under 15 seconds, as 15 seconds is the maximum length of a non-skippable ad. The GLRC pays to promote these videos as "pre-roll" advertisements on YouTube, utilizing both the short, non-skippable ads and traditional skippable ads. While Google indicates that a "good" view rate is 15%, the GLRC's is 22%, indicating that nearly a quarter of users presented our videos are watching them. Data also indicates that many users continue to watch our pre-roll advertisements even when given the option to skip ahead to their intended video.

Most encouraging is YouTube's ability to expand our audience demographic. While Facebook Analytics indicate that content is reaching an older, more female audience, a quarter of our YouTube views are from young men. Our multimedia approach is meeting our residents where they are and ensuring our outreach material has a broad reach. It also helps us diversify the places our ads display. Due to YouTube TV and the use of "casting", over 25% of viewers are viewing from Television screens. And because Google owns YouTube, these ads show up throughout the Google ecosystem and any website that uses Google Ads, not *just* YouTube. Find the channel here: https://www.youtube.com/channel/UCm-2OdB67N_dSAnR5osYSFw

*During Covid-19, the GLRC Coordinator and GLRC members were unable to satisfy in-person outreach events. In summer 2020, GLRC members submitted a PEP amendment to replace in-person PEP BMPs with a commitment to fund YouTube ads.

The GLRC began utilizing these YouTube ads at the beginning of 2020. The following reflects ad statistics from Jan 1st to Dec 31st, 2020:



Dog Calendar Contest – One of our most successful outreach initiatives, the annual Dog Photo Calendar Contest, offers residents a chance to see their dog as a month's feature photo and win a pet store gift card. In order to enter, contestants must read about pet waste's impact on water quality and pledge to pick up after their pets. The GLRC launched the first contest in 2018 and it has grown each year, with between three and four hundred entries each.

The submittal form includes an option for entrants to subscribe to the GLRC newsletter, allowing us to continue to reach these new contacts and engage them in our messaging in the future. The following indicates the number of newsletter signups resulting from each contest.

2018: 107 signups
2019: 75 signups
2020: 118 signups

New Brochures – In late 2018 and early 2019, the GLRC redesigned its suite of brochures and added Green Infrastructure as an additional topic. Redesigned tri-fold brochures also include Pet Waste Management, Fertilizer and Lawn Care, Responsible Car Washing, Motor Oil Management, and Do You Know Your Watershed? These are distributed at events and lobbies. The GLRC Coordinator distributed 1,188 brochures at events during the reporting period. The brochures were also available on GLRC webpages that received 715 views. The following reflects distribution of brochures related to individual required PEP topics.

- Topic 1: 352 brochures distributed
- Topic 4: 2,092 brochures distributed
- Topic 6: 2,474 brochures distributed
- Topic 8: 29 brochures distributed
- Topic 9: 904 brochures distributed

Similar information is presented digitally on the website and social media.

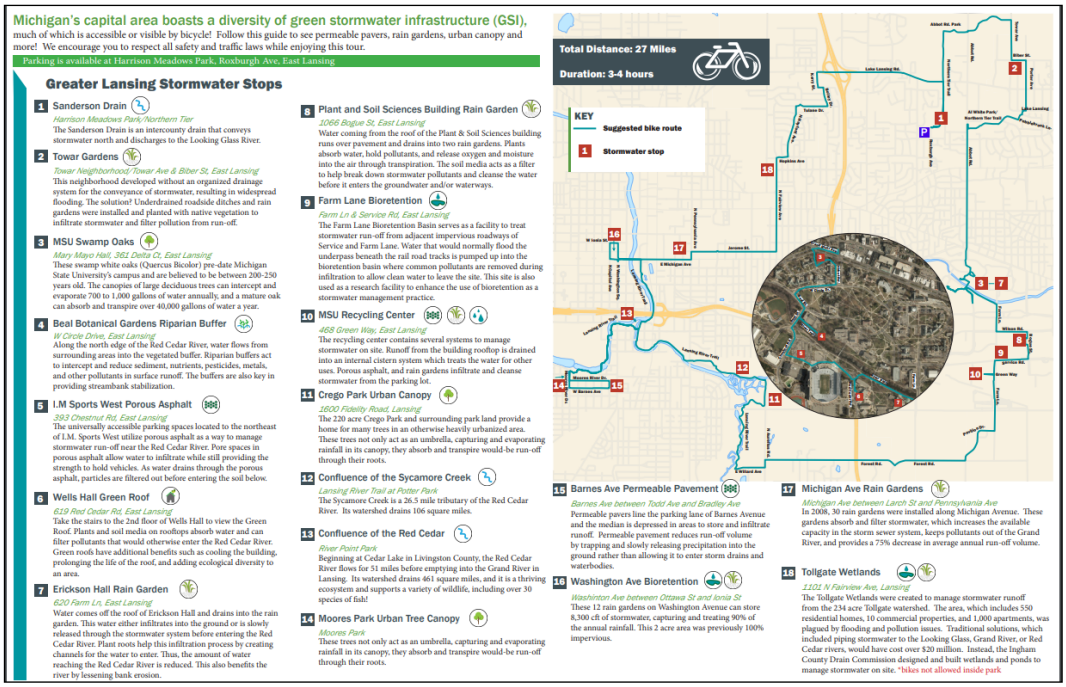
Overall, 5,387 total pieces of outreach material - including MyWatersheds.org stickers, bracelets, bike tour maps, etc - were distributed by the GLRC coordinator at events during the reporting period.

Rain Garden Seed Cards – In 2017, the GLRC began distributing rain garden information cards printed on paper embedded with native Black-Eyed Susan seeds. These provide information on the benefits of native plantings and provide residents with seeds to plant their own. They have proven very popular at events. Since 2017, 799 have been distributed through the GLRC Coordinator. MSU purchased in bulk from the GLRC and distributed these cards at a number of outreach events.

Dog Waste Bag Dispensers -- In 2017 the GLRC began distributing branded dog waste bag dispensers with the tagline “In The Bag, Not The River” to meet pet waste education requirements. To receive one at events, attendees must sign a pledge to pick up after their pets. The pledge form also gives them the option to sign up for the GLRC newsletter. Since 2017, 1075 have been distributed by the GLRC Coordinator. MSU purchased in bulk from the GLRC and distributed these dispensers at a number of outreach events.

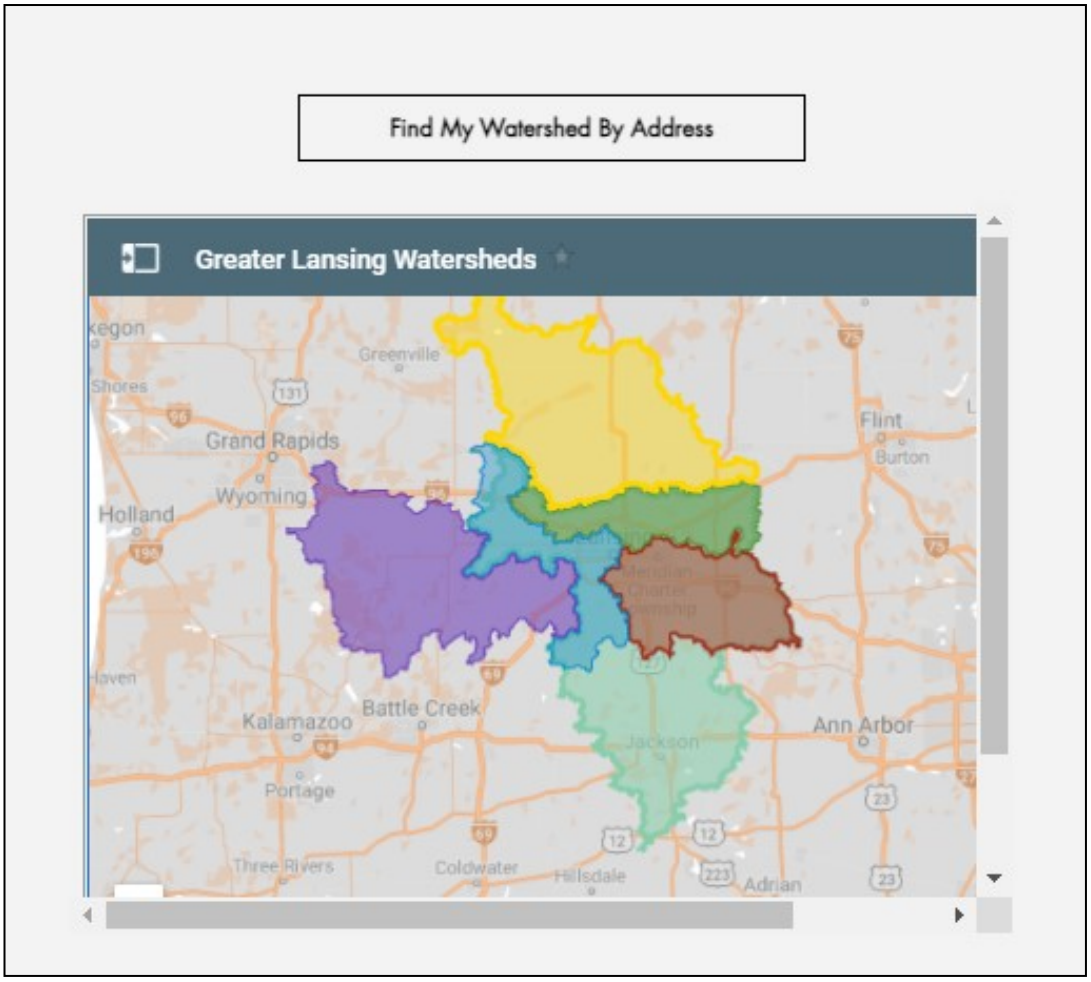
Dog Park Map and Pledge: In 2017, the GLRC developed a map of local dog friendly parks that includes information on pet waste’s impact on our water resources. These were hung up at area park and trail head bulletin boards. An additional version was developed for in-person events that included the pledge mentioned above. Signatories received a dog waste bag dispenser and a copy of the dog park map to take home.

Green Infrastructure Bike Tour – A bicycle tour of area green infrastructure was developed in 2019 to provide users an interactive experience and inspire them to install green infrastructure on their own properties. The bike tour follows area bike trails and includes a printable map as well as a custom Google Map.



Watershed Tattoos – The GLRC added an additional "swag" item to distribute during the permit cycle: a temporary Middle Grand River watershed tattoo. Sized to fit a hand, it creates a geographically accurate depiction of the Middle Grand River watershed overlaid the Michigan "mitten".

Find My Watershed Tool – In 2019 the GLRC developed a Find My Watershed Tool. Users can plug in their home address and see which watershed they live in and where they live within it. It also provides information about the watershed, links to 319 plans, and contact information for watershed organizations focused on stewardship within its boundaries. Survey results indicate that many residents do not know that they live in a watershed and this tool has made it easier for them to learn about the watershed they call home. This tool was visited 33,638 times since it's publishing.

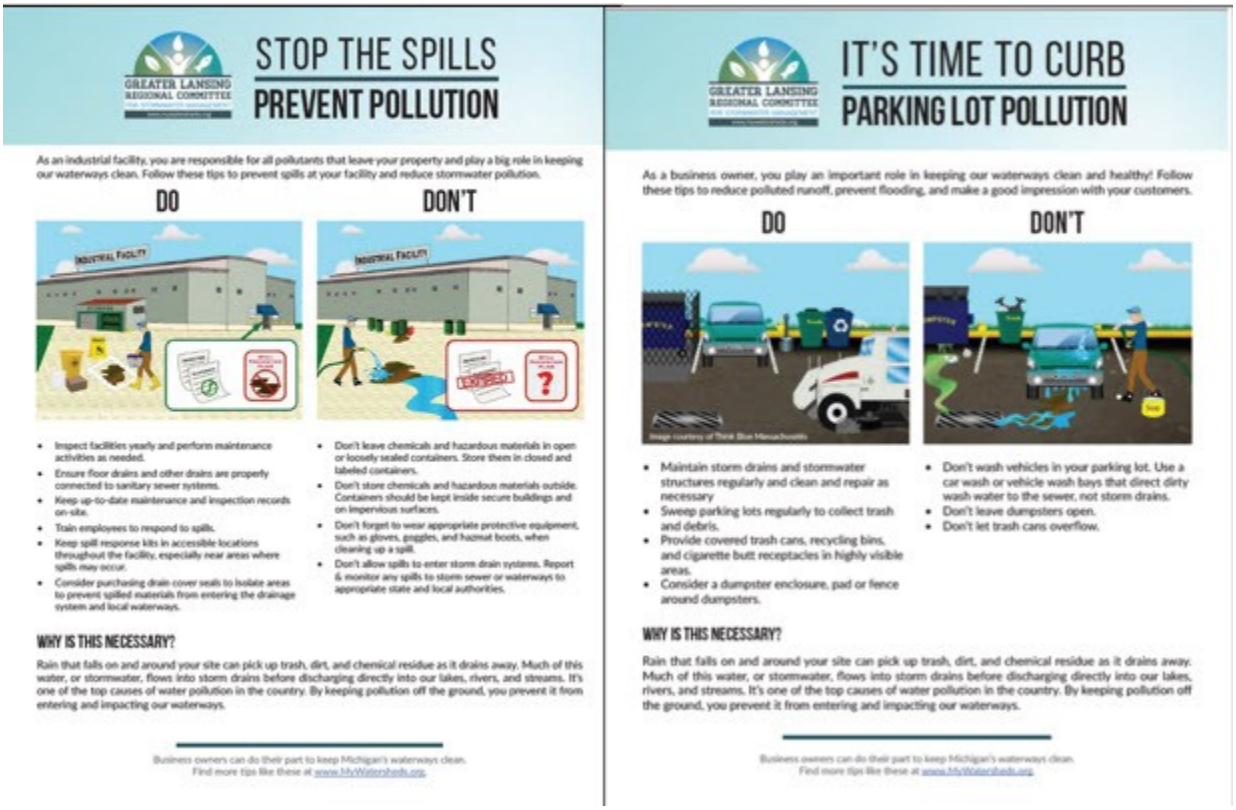


Business Outreach: During the reporting period, the GLRC developed a variety of resources for local businesses to help educate them and staff on pollution prevention at their facilities and as part of their operations:

For Business Webpage – In 2020, a For Businesses webpage was developed to house outreach information particular to businesses and industrial facilities and flyers/posters detailing industrial BMPs. It has had 158 views. www.MyWatersheds.org/businesses

Business Mailing – In 2020 the GLRC is developed a mailable poster focused on business and industrial BMPs. This will be mailed to industrial facilities and available online for other businesses.

Business Posters – Ten posters/flyers focusing on business and industrial facilities were produced in 2020 and included on the GLRC For Business webpage. It includes facility management BMPs for salt usage, vehicle cleaning, landscaping, and more. They are designed to be utilized on break room bulletin boards and other public areas.



STOP THE SPILLS
PREVENT POLLUTION

As an industrial facility, you are responsible for all pollutants that leave your property and play a big role in keeping our waterways clean. Follow these tips to prevent spills at your facility and reduce stormwater pollution.

DO

- Inspect facilities yearly and perform maintenance activities as needed.
- Ensure floor drains and other drains are properly connected to sanitary sewer systems.
- Keep up-to-date maintenance and inspection records on-site.
- Train employees to respond to spills.
- Keep spill response kits in accessible locations throughout the facility, especially near areas where spills may occur.
- Consider purchasing drain cover seals to isolate areas to prevent spilled materials from entering the drainage system and local waterways.

DON'T

- Don't leave chemicals and hazardous materials in open or loosely sealed containers. Store them in closed and labeled containers.
- Don't store chemicals and hazardous materials outside. Containers should be kept inside secure buildings and on impervious surfaces.
- Don't forget to wear appropriate protective equipment, such as gloves, goggles, and hazmat boots, when cleaning up a spill.
- Don't allow spills to enter storm drain systems. Report & monitor any spills to storm sewer or waterways to appropriate state and local authorities.

WHY IS THIS NECESSARY?

Rain that falls on and around your site can pick up trash, dirt, and chemical residue as it drains away. Much of this water, or stormwater, flows into storm drains before discharging directly into our lakes, rivers, and streams. It's one of the top causes of water pollution in the country. By keeping pollution off the ground, you prevent it from entering and impacting our waterways.

Business owners can do their part to keep Michigan's waterways clean.
Find more tips like these at www.MyWatersheds.org.

IT'S TIME TO CURB
PARKING LOT POLLUTION

As a business owner, you play an important role in keeping our waterways clean and healthy! Follow these tips to reduce polluted runoff, prevent flooding, and make a good impression with your customers.

DO

- Maintain storm drains and stormwater structures regularly and clean and repair as necessary
- Sweep parking lots regularly to collect trash and debris.
- Provide covered trash cans, recycling bins, and cigarette butt receptacles in highly visible areas.
- Consider a dumpster enclosure, pad or fence around dumpsters.

DON'T

- Don't wash vehicles in your parking lot. Use a car wash or vehicle wash bays that direct dirty wash water to the sewer, not storm drains.
- Don't leave dumpsters open.
- Don't let trash cans overflow.

WHY IS THIS NECESSARY?

Rain that falls on and around your site can pick up trash, dirt, and chemical residue as it drains away. Much of this water, or stormwater, flows into storm drains before discharging directly into our lakes, rivers, and streams. It's one of the top causes of water pollution in the country. By keeping pollution off the ground, you prevent it from entering and impacting our waterways.

Business owners can do their part to keep Michigan's waterways clean.
Find more tips like these at www.MyWatersheds.org.

The GLRC Coordinator presented to a local business fraternal group in 2017 on the GLRC and stormwater management.

Customer Education Collaboration – The GLRC seeks to work with area businesses to educate their customers on stormwater pollution prevention:

- Between 2019 and 2021, the GLRC worked with the Capital Area Humane Society to provide 750 dog waste bag dispensers and pet waste brochures to be included in the adoption packets for new pet owners. These materials highlight the importance of picking up pet waste while providing them the tool needed to start good dog ownership habits. This relationship will continue.

- In 2019, the GLRC met with Scoops Co, a dog waste pick-up service, to discuss collaboration to educate residents on the importance of picking up pet waste. 500 pet waste tri-fold brochures were given for inclusion in their marketing materials. This assisted the GLRC in spreading our message, and helps the businesses promote a new angle – water quality – as a benefit of their services. Scoops Co and two competing companies are listed as resources on the GLRC website to make residents aware of these services which are particularly beneficial to pet owners that are elderly and or with limited mobility.

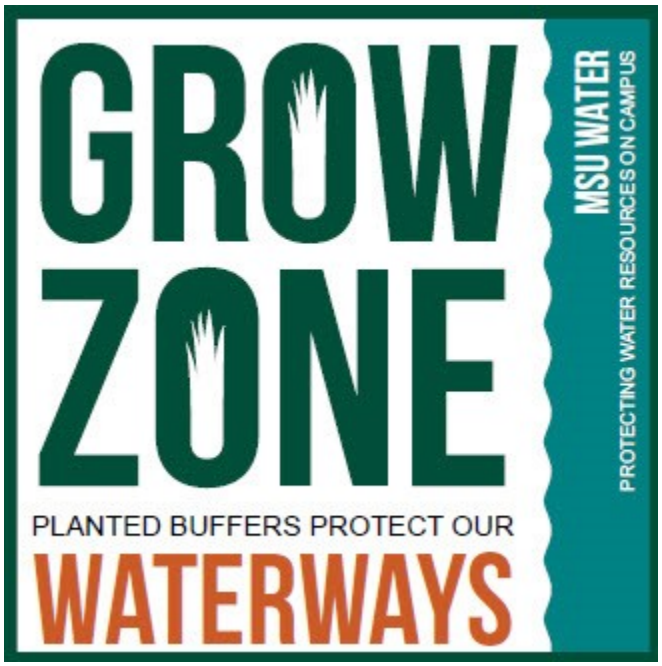
- In 2018, the GLRC provided 500 "MyWatersheds.org" stickers to Rivertown Adventures to distribute to their paddle-craft rental customers. These stickers feature paddles over an image of the State of Michigan, with text promoting the MyWatersheds.org website.

- In 2018, the GLRC Coordinator distributed GLRC stickers and MGROW membership brochures to Moosejaw, a local outdoor outfitter, to make available at the counter for their customers. This encourages awareness of the GLRC and encourages residents joining local watershed organizations, one of the "top ten tips" the GLRC promotes for stormwater stewardship.

In summer of 2018, the GLRC Coordinator reached out to multiple commercial car wash operations in the Lansing area and shared digital copies of the GLRC car washing brochure. The intent is to help them sell their services with a new, untapped angle; that they are the environmentally friendly alternative to at home driveway washing.

Storm Drain Labeling – Catch basins across campus are labeled in order to bring awareness to the general public that storm drains flow to waterways of the state, and to not dump pollutants into the drains. Curb markers are checked each summer season, with approximately 20% replaced each year. EHS maintains records of the replacements.

Grow Zone Signs are maintained on campus to emphasize the importance of buffers for protecting waterways. The signs were updated in 2018 to reflect the new branding of outreach materials.



EPA Rainworks Challenge - MSU Stormwater Committee members worked with students in 2019 on the competitive EPA Rainworks Challenge to re-envision sustainable stormwater management on campuses across the United States. MSU's entry *Blue Lines* received Honorable Mention in the Master Plan category.

Sustainability Pledge - The MSU Office of Sustainability launched the MSU Sustainability Pledge in June 2020 as a means to engage all incoming students through New Student Orientation. At the start of the Fall 2020 semester, the pledge was expanded for faculty, staff and community members. The pledge incorporates sustainable actions that members of the Spartan Community can engage whether on campus or at home across seven categories: energy, water, food, health, transportation, waste and engagement. As of December 31, 2020, 657 members of the MSU community have committed to protecting the Red Cedar River "by not dumping anything down a storm drain or in the river."

Sustainability Walks - The Office of Sustainability hosts weekly sustainability walks in partnership with Health4U and other campus partners during Sustainability Month (October) and Earth Month (April). The weekly walks showcase the ways in which sustainability is embedded within MSU's campus, curriculum, culture and community, highlighting topics such as freshwater protection, green infrastructure, green buildings, sustainable food, and renewable energy. Twelve individuals participated in sustainability walks that included stormwater education during the 2019-2020 academic year.

Illicit Discharge Elimination Program

The Illicit Discharge Elimination Program (IDEP) describes current and proposed Best Management Practices (BMPs) to meet the minimum control measure requirements to the Maximum Extent Practicable. The following definitions apply to the IDEP:

- Illicit Discharge: Any discharge to, or seepage into, an MS4 that is not composed entirely of stormwater or uncontaminated groundwater except discharges pursuant to an NPDES permit.
- Illicit Connection: A physical connection to an MS4 that primarily conveys non-stormwater discharges other than uncontaminated groundwater into the MS4; or a physical connection not authorized or permitted by the local authority, where a local authority requires authorization or a permit for physical connections.

In addition to prohibiting illicit connections as part of the Plumbing Code in the University's Construction Standards, Standard Operating Procedures that prohibit illicit discharges into the University's storm sewer system are in place, and are under the purview of MSU's Office of Environmental Health and Safety (EHS).

All outfalls and points of discharge for the MSU campus have been documented. That information is available in **Appendix B**.

IDEP Inspections and Corrective Actions

All MSU outfalls were screened in 2015. In fall of 2016, we investigated 18 outfalls – one that had high E-coli when sampled in 2015, and the rest that were either submerged or unlocatable in 2015. All outfalls were traced back to the nearest manhole with the help of IPF staff. Only two manholes had flowing water – for outfalls 21 and 49. Those outfalls were sampled in December of 2016, and samples were analyzed at Brighton Analytical. Both had high E. coli counts. At the time, we assumed this was due to the large amount of precipitation in the previous month, and we decided to resample again in 2017 to see if E. Coli was still a problem. We re-sampled both locations in September 2017, and only outfall 49 came back with high E. Coli. At this point, IPF investigated several other locations that fed to this outfall. It was traced back to a cross-connection in a Snyder-Philips laundry room. The cross-connect was corrected in May 2018. The work was coordinated with the grease trap replacement for Snyder-Philips Hall.

The MSU Environmental Health and Safety (EHS) Office responds to all concerns or questions regarding potential illicit discharges to the Red Cedar River. Calls from the public and the campus community are routed from either the MSU Police or the IPF to the Environmental Compliance Office of EHS. The Environmental Compliance Office then makes a record with the time/date of the call and the nature of the concern. As soon as practicable, a staff member physically verifies any issues. If any discharges are noted, a sample is taken and analyzed, and further investigation is undertaken to determine the source of the discharge. If no issues are verified by the MSU staff, a note will be made on the record, and the approximate location will be watched in the future to see if the issue arises again. Records of these calls and responses are maintained by the MSU EHS Department.

Illicit Discharge Concerns for this reporting period

Reddish sediment coming from outfall 52 - 9/10/18, 6:19pm – Jack Schineman with the City of East Lansing forwarded to MSU IPF a complaint email he received regarding reddish sediment flowing from Outfall 52.

IPF staff investigated and traced the discharge to a well on South campus that was being flushed. The well was draining into the campus storm sewer. Proper SESC measures were in place, but the high iron content of the well was causing a rust-colored flow. The well flow was diverted to a nearby field by 9/12/18 and the flow at the Outfall returned to normal. As part of the process, all nearby construction sites were also checked for proper SESC measures, and no violations were found. Ruth Kline-Robach called EGLE storm water staff to notify them of the issue.

Grey water discharge to storm drain - 8/13/2019, 11am – MSU EHS was made aware of a steam tunnel flooding event that had been discharged to a storm drain. A water valve failure around 8am near MSU Laundry building caused up to 1000 gallons of grey water from the Laundry building to flood into the steam tunnels adjacent to that building. As an emergency measure, the water was immediately pumped out to a nearby storm drain. Mary Lindsey called EGLE storm water staff to notify them of the issue.

Cross-connect at MSU FRIB building - 11/11/2020, 11:51am – MSU EHS received a call about a foul smell coming from a storm drain in the parking lot of the FRIB building. EHS staff confirmed the smell that afternoon and contacted MSU IPF to do further investigation. An infrequently used restroom facility near the northeast loading dock off South Shaw Lane that was inactive for some time was put back into service due to some other restroom renovations and reconfiguring of space within the FRIB building. It was discovered that the restroom's outlet went to storm. Upon discovery, the restroom was shut down. The corrective measures were completed by an open order contractor under the direction of the IPF plumbing shop. The catch basins and storm sewer in the vicinity of the loading dock (structures CB12218 and 16966) had their sumps cleaned with the *Vactor* truck and disinfected and the building plumbing was corrected. By 12/15/2020, the cross-connection was resolved with the bathroom re-plumbed to sanitary. The connection was verified with a camera.

West Range, East Range and CIPS Green Houses (Buildings 0093, 0098C and 181A) - The West Range South Headhouse was razed in late spring 2020 due to structural condition of the block foundation system that could not be repaired. During the removal of the building, it was discovered that some of the greenhouse floor drains were connected to dry wells and/or the storm sewer outlet for the building. The drains were then reconnected to the respective sanitary outlet for the building. The West range outlets to Sanitary manhole 25094, the East Range and CIPS now outlet to sanitary manholes 1458 and 1390. The GIS/sewer maps have been updated accordingly. Work was completed in May-June 2020.
MSU also works to minimize the potential for seepage from the sanitary sewer system. MSU was awarded a SAW grant to focus on cleaning, televising and condition assessment of both the storm and sanitary sewer collection system. The data gathered has been incorporated into the University's GIS system.

River Monitoring

MSU continues to collaborate with the Ingham County Health Department and other jurisdictions within the county on the Ingham County Surface Water Roundtable, which conducts weekly *E. coli* sampling throughout the Red Cedar River Watershed April-October. That data is available as a link from the MSU-WATER website.

IDEP Staff Training

In addition to online stormwater training that includes an illicit discharge detection component (see Good Housekeeping section), MSU staff members participated in IDEP training hosted by the GLRC in July 2016 and July 2018.

Evaluation of IDEP Program

The MSU Stormwater Committee reviews the Illicit Discharge Program activities annually to discuss progress toward goals and necessary changes. The committee discussed its IDEP program on the following dates: 12/7/16, 12/6/17, 12/5/18, 12/4/19 and 12/2/20.

Post Construction Stormwater Runoff

Post-construction stormwater runoff controls are necessary to maintain or restore stable hydrology in receiving waters by limiting surface runoff rates and volumes and reducing pollutant loadings from sites that undergo development or significant redevelopment. Under Michigan's MS4 stormwater permit, post-construction stormwater runoff from all new and redevelopment projects that disturb one acre or more, must meet the following stormwater discharge criteria:

- Treatment methods shall be designed on a site-specific basis to achieve discharge concentrations of total suspended solids (TSS) not to exceed 80 milligrams per liter (mg/l) resulting from up to one inch of rainfall.

- The channel protection criteria shall maintain post-development site runoff volume and peak flow rate at or below existing levels for all storms up to the 2-year, 24-hour event (2.42 inches).

Stormwater Design Standards and Off- Site Mitigation

The approach for MSU views the campus as one parcel with the Red Cedar River as its outlet. Each individual development or redevelopment project is required to evaluate a method of complying with the stormwater requirements at the site and prepare a cost estimate for construction, following the procedures in the MSU Stormwater Design Standards, which will then be submitted to the campus Stormwater Review Committee. The methodology used in the development for the design standards was vetted through EGLE staff in a series of meetings.

Projects that may alter the stormwater volume or peak-rate characteristics are tracked on a campus-wide basis and tabulated in a credit system or bank. Projects contributing to the bank will include demolition projects (e.g., buildings, parking lots, roadways) and stormwater improvement projects (e.g., porous pavement parking lots, bio-retention areas, etc.).

Recognizing that new projects located in highly developed zones of campus will have difficulty meeting the stormwater permit standards without incurring excessive costs or without resorting to impractical solutions such as stormwater pumping, the Stormwater Committee may recommend that a project use credits from the campus bank to meet its stormwater requirements under the new general permit. This decision will be made on a project-by-project basis after a site-specific evaluation and cost estimate has been completed. If a project applies for bank credits, the project may be charged a proportionate cost to help pay the capital costs associated with a larger, regional project that would be implemented to maintain the stormwater bank. Under the alternative approach, regional projects would have to demonstrate effectiveness of a 1.2 multiplier for all permit parameters over a site-specific solution. Larger development projects that have enough land area available for LID techniques that exceed their stormwater requirements may also contribute to the campus bank. If the offset bank has been expended and an offsite project is deemed necessary, the regional stormwater control project must be completed concurrently with the development or within one calendar year of substantial completion of the project.

Documentation of Existing System

The MSU IPF Division is responsible for maintaining the storm sewer maps and infrastructure records for the campus. All storm sewer pipes and structures have been mapped and documented in a Geographic Information System (GIS) database. The storm sewer pipes range in size from 12 inches to 84 inches and provide stormwater conveyance for approximately 2,200 acres of north campus. All storm sewer revisions completed on construction projects are recorded as the projects are completed so the GIS system stays current. A number of green stormwater infrastructure techniques have been implemented across the campus, including bioretention areas, green roofs and porous pavement. Proprietary treatment systems have been installed as well, including numerous stormwater separators located throughout campus and a nutrient-separating baffle box that was installed at Birch and Wilson Roads.

Stormwater BMPs are tracked by MSU IPF. As required by the NPDES Stormwater Permit, the BMP and impervious summary for the reporting period is included as **Appendix C** of this report.

Site Specific Requirements

The Stormwater Committee is also responsible for reviewing the use of infiltration BMPs to meet the water quality treatment and channel protection standards for new development or redevelopment projects in areas of soil or groundwater contamination in a manner that does not exacerbate existing conditions. The committee meets monthly to discuss upcoming development projects, including proposed stormwater treatments options. Design review methodology discourages infiltration BMPs in areas of known soil or groundwater contamination. In these areas, alternative BMP designs are discussed and proposed.

The committee reviewed this procedure at its December 2020 regular meeting. The committee maintains that the monthly meetings and ongoing discussions regarding these site-specific considerations is effective and appropriate.

Upcoming Activities

New BMPs that are slated to come online beyond this reporting period are included in the summary report, which is included as **Appendix C.**

Construction Stormwater Runoff

The Federal National Pollutant Discharge Elimination System (NPDES) Stormwater Program is part of the Clean Water Act administered by US Environmental Protection Agency. One aspect of this program addresses runoff from construction activities. Administration of the NPDES Stormwater Program in Michigan has been delegated to EGLE. These permit requirements specifically reference discharges from construction activities where the pollutants enter the MS4 owned or operated by the permittee and when the pollutants are in violation of any of the following:

- Section 9116 of Part 91 of the Michigan Act- *Sec.9116. A person who owns land on which an earth change has been made that may result in or contribute to soil erosion or sedimentation of the waters of the state shall implement and maintain soil erosion and sedimentation control measures that will effectively reduce soil erosion or sedimentation from the land on which the earth change has been made.*
- Michigan's Permit-by-Rule at R 323.2190(2)(a)- *Not directly or indirectly discharge wastes such as discarded building materials, concrete truck washout, chemicals, lubricants, fuels, liter, sanitary waste, or any other substance at the construction site into the waters of the state in violation of Part 31 of the Act or rules promulgated there under.*

Procedure to Ensure that Construction Activity One Acre or Greater in Total Earth Disturbance with the Potential to Discharge is Conducted by an Approved Authorized Public Agency

The University works with the City of East Lansing, Ingham County and Meridian Township, which are designated by EGLE as Authorized Public Agencies and Municipal Enforcing Agencies pursuant to Part 91. As such, campus development projects must obtain a Grading/Soil Erosion and Sedimentation Control permit from the City, County or Township. A number of staff members from the MSU IPF Division and Land Management Office (LMO) have successfully completed the Certified Stormwater Operator (CSWO) training and passed the CWSO/SESC Inspector exam. These individuals serve as the campus project representatives to ensure that all SESC requirements are met for new development projects.

Procedures to Ensure Adequate Allowance for Soil Erosion and Sedimentation Controls on Preliminary Site Plans, as Applicable:

As part of standard design and construction procedures on campus, staff members from IPF Planning, Design and Construction (PDC) or the LMO review or prepare all Soil Erosion and Sedimentation Control Plan drawings and specifications. These documents are produced by a consultant or internally, PDC or LMO staff members begin site analysis in the Schematic Design stage or earlier. The SESC document is being produced by a consultant, they are provided with the SESC/Stormwater Discharge checklist and other information as appropriate.

The acreage of the project and proximity to surface waters determines whether the proposed construction will require a permit. If a permit is required, the site location determines the appropriate governing agency; City, County or Township. The SESC documents are reviewed by PDC or LMO staff, in cooperation with the appropriate governing agency, multiple times throughout the design process to ensure that the appropriate controls will be in place according to the specific site. Documents are put out for bid and PDC or LMO staff confirm that all necessary SESC devices and techniques are clearly located and quantifiable.

Throughout the construction process regular site visits are performed by PDC or LMO staff members, who are Certified Storm Operators.

All SESC documentation is available at IPF PDC.

Procedures to Provide Notice When Pollutants Are Discharged from Construction Activities:

Where any pollutants are discharged from a construction activity in violation of any of the above noted statutes, to MSU's storm sewer system, the University will provide the following notifications:

- If soil, sediment or any other wastes that may adversely affect adjacent properties or public rights-of-ways, are discharged from a site, the University's CSWO assigned to that project location will notify the Authorized Public Agency within 24 hours of becoming aware of the discharge and consult with them regarding EGLE notification.
- If the University suspects that the discharge may endanger public health or the environment, the violation will be reported within 24 hours of becoming aware of the discharge. The CSWO assigned to that project location will work with the MSU Office of Environmental Health and Safety (EHS), which will ultimately report the discharge to EGLE.

Files are maintained by the City of East Lansing.

Procedures for the Receipt and Consideration of Complaints or Other Information Submitted by the Public Regarding Construction Activities Discharging Wastes to the MS4:

The University's CSWOs from the IPF and LMO inspect all permitted construction sites on a regular basis. As part of the Public Education Plan activities, individuals will be instructed to contact the IPF main dispatch number at 517-353-1760 with concerns about construction activity discharges. If a complaint is received dispatch operators will then notify the CWSO assigned to that location for immediate review. All complaints will be reviewed by no later than the next business day after receipt. Any action required by the contractor will be processed immediately.

Pollution Prevention and Good Housekeeping Program

The NPDES stormwater requirements stress the importance of developing proper pollution prevention procedures and maintaining good housekeeping practices on municipal property.

Municipal operations cover a wide variety of activities and land uses that are potential sources of stormwater pollutants. These include, but are not limited to roadways; parking lots; transportation and equipment garages; fueling areas; warehouses; stockpiles of salt and other raw materials; open ditches and storm sewers; turf and landscaping for all municipal properties, including parks; and waste handling and disposal areas.

IPF Landscape Services has developed Good Housekeeping and Pollution Prevention Standard Operating Procedures. That document is included as **Appendix D**. In addition, operating procedures pertaining to specific requirements in the stormwater permit are included below.

High-Priority Sites

The MSU Stormwater Committee identified the following facilities as high-priority:

1) MSU Transportation Services
2) MSU Surplus Store & Recycling Center
3) Forest Akers Golf Course Maintenance Facility.

MSU maintains separate Stormwater Pollution Prevention Plans (SWPPP) for these facilities. MSU EHS conducts monthly housekeeping inspections at each of these locations, looking specifically at areas of high concern (e.g., fuel tanks, outdoor storage, etc.). In addition, EHS staff also conduct quarterly comprehensive site inspections at each location to verify that the entire site is in compliance with the SWPPP. Inspection records are available at EHS.

Medium-and Low-Priority Sites

MSU's parking lots and parking ramps have been identified by the Stormwater Committee as medium-priority facilities. For these and the remaining facilities identified as lower-priority sites, standard operating procedures as included in the GLRC "Good Housekeeping and Pollution Prevention for Municipal Activities" guide as well as procedures documented in the SWMP.

Structural Stormwater Control Operation and Maintenance Activities

Landscape Services is responsible for collecting and disposing of debris and wastes from MSU's sewer and catch basin cleaning; street sweeping and other sources of pollution that may otherwise be discharged into the separate stormwater drainage system. MSU's Office of Environmental Health and Safety (EHS) oversees compliance with Part 121 rules dealing with liquid industrial wastes, including ensuring that contractors meet all applicable requirements. The IPF Division is responsible for ensuring compliance with Part 115 solid waste disposal.

Collections for this reporting period are listed below:

- In 2016: 403 catch basins serviced, with 220,480 lbs. of debris collected. 18 oil separators serviced, with 6,200 gallons of water/slurry removed.

- In 2017: 550 catch basins serviced, with 219,773 lbs. of debris collected. 12 oil separators serviced, with 8,500 gallons of water/slurry removed.

- In 2018: 744 catch basins serviced, with 280,400 lbs. of debris collected. 7 oil separators serviced, with 6,420 gallons of water/slurry removed.

- In 2019: 365 catch basins serviced, with 194,220 lbs. of debris collected. 10 oil separators serviced, with 11,552 gallons of water/slurry removed.

- In 2020: 0 catch basins serviced, and 0 oil separators serviced, due to the COVID-19 pandemic.

Municipal Operations and Maintenance Activities

IPF staff members have developed a stormwater facilities inspection spreadsheet that includes various BMPs and routine inspection and maintenance tasks for each. IPF also maintains a map of BMPS, with an accompanying spreadsheet to document inspection and maintenance dates and labor hours for each BMP. The spreadsheets are housed on the IPF server.

Currently 47 storm water devices are being inspected and maintained by MSU IPF Landscape Services at a minimum of one visit per year. A Landscape Architect from Planning Design and Construction and the GIS Analyst from Landscape Services conduct bi-annual inspections as well. Each device has been assigned an equipment number which is used to track costs of inspection and maintenance. A map-based mobile application, typically used on iPhones, is being used in the field to track scheduled inspection and maintenance activities such as debris removal, invasive plant eradication and mowing This application allows the user to locate items on an interactive map that are scheduled for maintenance or inspection. Elements (Equipment) are only highlighted when they are due for an action.

Street Sweeping, Parking Lot, Sidewalk and Bridge Maintenance

Landscape Services is responsible for sweeping streets and parking lots on the MSU campus. All equipment is maintained on a fixed schedule; streets and parking lots are currently swept a minimum of two times per year. Structures are swept monthly and washed annually or as needed. Sweepings are stored in a roll-off bin and hauled to an approved landfill. No street sweepings are composted. Parking lots are swept on a regular basis following the street sweeping rotating schedule. During this reporting period, roadways and parking lots sweepings collected approximately 140 cubic yards of debris per year. Documentation is available at MSU Landscape Services.

Cold Weather Operations

Snow and ice removal on the Michigan State University campus is a major priority of MSU Landscape Services. Documentation for this reporting period includes:

- 2016-17 snow season: 1,256 tons of salt applied, 71,603 gallons of salt brine applied, and $111,308 spent on deicing products.

- 2017-18 snow season: 2,299 tons of salt applied, 89,908 gallons of salt brine applied, and $98,394 spent on deicing products.

- 2018-19 snow season: 2,474 tons of salt applied, 105,000 gallons of salt brine applied, and $95,184 spent on deicing products.

- 2019-20 snow season: 2,407 tons of salt applied, 178,325 gallons of salt brine applied, and $269,846 spent on deicing products.

**2020-21 snow season: 1,669 tons of salt applied, 150,221 gallons of salt brine applied, and $111,612

was spent on deicing products. **FINAL TOTALS ARE REPORTED IN MAY EACH SEASON**

Employee/Contractor Training Related to Stormwater Management Activities

MSU has an online stormwater training program in place through ABILITY TRAINING COMPLIANCE (MSU EBS PORTAL). The training program includes three (3) sections: Storm Water Protection (45 minute), SPCC/PIPP Management (30 minute) and Wellhead Protection Program (30 minute). MSU-specific information is included at the end of the training videos, as well as a short quiz. The Stormwater Protection segment is made mandatory for all Landscape Services staff.

During this reporting period, 559 employees across the University completed the Stormwater Training. Documentation is maintained by EHS.

MSU staff members leading stormwater maintenance activities are required to retain a Soil Erosion and Sediment Control Certification with the State of Michigan. A Certified Stormwater Operator regularly inspects construction sites for stormwater deficiencies and generates documentation for each inspection.

Contractor training pertaining to stormwater is required of all sub-contractor field personnel. These contractors are required to annually review and monitor the policies and practices relating to reporting of health, safety and environment, and incidents with respect to employees, facilities and operations, in compliance with applicable laws and regulations in Michigan.

Managing Vegetated Properties

University employees who apply pesticides and fertilizers are required to possess a valid commercial applicator's license from the State of Michigan. As part of the continuing education/recertification requirements, employees are trained in proper storage, handling and use of pesticides, herbicides, and fertilizers on the MSU campus.

Total Maximum Daily Load

Section 303(d) of the federal Clean Water Act (CWA) and the United States Environmental Protection Agency's (USEPA) Water Quality Planning and Management Regulations (Title 40 of the Code of Federal Regulations, Part 130) requires states to develop Total Maximum Daily Loads (TMDLs) for water bodies that are not meeting water quality standards. A TMDL was established by EGLE for portions of the Red Cedar River and subsequently approved by the USEPA. A TMDL establishes the allowable level of pollutants for a water body based on the relationship between pollution sources and in-stream water quality conditions. TMDLs provide a basis for determining the pollutant reductions necessary from both point and nonpoint sources to restore and maintain the quality of water resources.

The State of Michigan has officially established the limits for its *E.coli* TMDL to be a concentration-based standard as follows: "For this TMDL, the WQS of 130 *E.coli* per 100mL as a 30-day geometric mean and 300 E.coli per 100mL as a daily maximum to protect the TBC use are the target levels for the TMDL reaches for May 1 through October 31, and 1,000 E.coli per 100mL as a daily maximum year-round to protect the PBC use."

Procedure for identifying and prioritizing BMPs currently being implemented or to be implemented during the permit cycle to make progress toward achieving the pollutant load reduction requirement the TMDL

The MSU Storm Water Committee reviewed the EGLE document entitled *Total Maximum Daily Load for E. coli in Portions of the Red Cedar River and Grand River Watersheds* as well as the *Red Cedar River 319 Watershed Management Plan*, which was approved by the EGLE and USEPA in 2015, to set priorities for the *E. coli* TMDL implementation. Available monitoring data was also reviewed. The committee meets on a monthly basis, annually assesses progress in meeting TMDL requirements, and directs management strategies to address sources and causes of bacterial loading.

Monitoring conducted by the Ingham County Health Department and the 319 watershed project showed that bacteria were present during both dry and wet weather events throughout the watershed. Pollution presence during certain weather conditions can be indicative of the sources of the pollution. Based on work in the mid-Michigan area and elsewhere, dry weather sources of *E.coli* throughout the Red Cedar River Watershed may potentially be attributed to such things as leaky septic tanks, illicit connections, livestock, wildlife and regrowth of bacteria. Wet weather sources of *E.coli* are often associated with overland runoff. Source tracking in the Red Cedar 319 project showed the presence of both equine and bovine DNA in a majority of the subwatersheds analyzed.

Monitoring plan for assessing the effectiveness of the BMPs currently being implemented or to be implemented, in making progress toward achieving the TMDL pollutant load reduction requirement, including a schedule for completing the monitoring.

In addition to IDEP low-flow sampling, MSU participates in the ongoing sampling and monitoring program established by the Ingham County Health Department (ICHD) in 2004. The ICHD currently samples at 10 sites along the Red Cedar River, including sites at S. Hagadorn Road; Farm Lane Road; S. Harrison Road; and Kalamazoo Street. Sample results are available online.

Along with this continued in-stream weekly monitoring during the recreation season, wet-weather, end-of-pipe sampling has been conducted within five subwatersheds on the MSU campus to comply with TMDL

requirements: the drainage areas for outfalls 33, 37, 41, 42, 53. Those subdistricts encompass the campus academic core with continued development and expansion. In addition, subdistrict 53 includes drainage from the south campus farms area. Together, these subdistricts represent 78% of the main campus land area. A map of these areas is included as **Appendix E.**

Initial sampling of these outfalls was conducted in October 2020. The results are shown below:

Sampling Date		10/27/2020
Time		12:38 PM
Previous dry days		3
Precipitation (in)		0.13
Instream (*E.Coli* in MPN/100ml)	Hagadorn (Left)	160
	Hagadorn (Center)	660
	Hagadorn (Right)	260
	Hagadorn Average	**302**
	Harrison (Left)	100
	Harrison (Center)	130
	Harrison (Right)	110
	Harrison Average	**113**
Outfall (*E.Coli* in MPN/100ml)	#53 (Hagadorn Rd.)	41
	#41 (Farm Ln. - North)	2
	#42 (Farm Ln. - East)	180
	#33 (Farm Ln. - West)	36
	#37 (1855 Place)	41

Because these samples did not exceed standards, additional investigations and DNA analysis were not pursued.

Summary

The University is committed to continuing its commitment to managing campus water resources in a holistic manner. A watershed management plan was developed for the Red Cedar River Watershed, with an emphasis on *E. coli* bacteria. MSU faculty, students and staff members are working with numerous local partners in this effort. Along with those broader, watershed-wide efforts, good working relationships have developed among the members of the Greater Lansing Regional Committee for Stormwater Management (GLRC), and MSU will continue to be a full partner with these communities in the urbanized portion of the watershed as a member of this organization. In addition, the campus Stormwater Committee, comprised of staff members from multiple service units and departments, continues to emphasize an integrated approach to managing stormwater on campus.

APPENDIX A

MSU Stormwater Roles and Responsibilities
2021

MSU Stormwater Management Roles and Responsibilities
2021

Environmental Health and Safety – (Kevin Eisenbeis, Tom Grover and Mary Lindsey)

- Approve and sign off on all permit applications and related documents
- Coordinate low flow outfall screening once per permit cycle
- Maintain all outfall chemical testing files and ensure follow up with IPF at suspect outfalls
- Maintain IDEP database
- Direct drain marker program – maintain database and ensure annual reconnaissance
- Regularly inspect all facilities with a Stormwater Pollution Prevention Plans (currently Transportation Services, Recycling Center and Surplus Store and Golf Course Maintenance Facility)
- Respond to discharges and complaints about the river and track in database
- Meet illicit discharge reporting requirements for off campus properties in urbanized areas
- Work with Land Management Office on CAFO NPDES permit issues (e.g., recordkeeping, inspections, application renewal)
- Work with IPF to ensure compliance with stormwater runoff from construction sites
- Serve on stormwater committee (Kevin Eisenbeis, Mary Lindsey)

MSU-IWR with BAE, Horticulture and other academic departments (Ruth Kline-Robach)

- Manage/coordinate campus stormwater activities with EHS
- Ensure active role of MSU in Greater Lansing Regional Committee activities
- With input from all service units, write permit applications and annual reports
- Update Stormwater Management Program as needed
- Serve as liaison with MDEQ representatives
- Conduct research and report on BMP/LID technique efficacy
- Plan and host outreach events, coordinate stormwater public education efforts
- Link with local 319 watershed planning efforts
- Work with faculty to incorporate service learning and additional course work featuring the river and stormwater controls
- Serve on stormwater committee

Infrastructure Planning and Facilities (IPF) – Planning, Design and Construction (Dave Wilber, John LeFevre and Scott Gardner)

- Ensure compliance with post construction controls and stormwater design standards for all new development projects
- Maintain offset database for post contruction controls
- Annually, complete offset database summary
- Maintain accounts and track budgets for long term maintenance of stormwater BMPs
- Maintain central file sharing service (accessible by all service units) for all stormwater-related documents
- Survey General Fund buildings for illicit connections and prioritize corrective actions
- Track BMP maintenance schedules
- Maintain storm drain maps, sewershed maps and outfall database
- Provide design guidance to outside consultants working on capital projects to maintain adherence to the stormwater design standards
- Provide design guidance on alternative approaches when deemed appropriate by the stormwater committee
- Maintain the stormwater design standards accessible on the EAS website
- Serve on stormwater committee (Wilber and Lefevre)

IPF Campus Planning (Steve Troost)

- Link stormwater and wellhead protection planning with campus Master Plan
- Coordinate with EAS and LMO to ensure land base for future stormwater controls
- Serve on stormwater committee

IPF Landscape Services

- Inspect and maintain structural and nonstructural stormwater BMPs
  - Rain gardens and vegetated roofs, Landscape Bed Chemical Application (Paul Harper, Scott Feick, Josh Ridner)
  - Riparian zones, wetlands, detention ponds, low-mow zones (Paul Harper, Scott Feick, Josh Ridner)
  - Pervious pavement, catch basins, storm separators (Matt Fehrenbach)
- Document and follow Good Housekeeping procedures, including street sweeping, fertilizer and pesticide applications, snow and ice removal and other items in the SWMP (Matthew Bailey and Jeremiah Saier)
- Mandate stormwater training for selected staff members at least once per permit cycle (Matthew Bailey and Jeremiah Saier)
- Serve on stormwater committee (Jeremiah Saier)
- Tree Chemical Application (Jerry Wahl)

IPF (Misc) –

- Chair stormwater committee to review stormwater controls (John LeFevre)
- Inspect/track Soil Erosion and Sedimentation Control permits to ensure compliance with stormwater regulations (Nick Walton)
- Track grease trap cleaning at all campus cafeterias (Shawn Kelly)
- Ensure regular sanitary sewer maintenance and cleaning (Sam Fortino)
- Maintain Lift Stations (Sam Fortino)
- Include stormwater in training activities (e.g., Contractors and Consultants Forum) (Leisa Williams-Swedberg)
- Include stormwater on IPF website (Fred Woodhams)

IPF Power and Water

- Coordinate campus Wellhead Protection Program and complete updates every five years (Sherri Jett with Ruth Kline-Robach)
- Consider linkages with stormwater permit requirements

AgBioResearch (Ben Darling)

- Ensure compliance with stormwater standards for areas of new development
- Ensure good housekeeping practices on south campus to comply with stormwater regulations and maintain MAEAP certification for south campus farms
- Mandate stormwater training for farm managers at least once per permit cycle
- Mandate regular septic system maintenance and develop/maintain database
- Maintain structural and nonstructural BMPs and track in database
- Track Soil Erosion and Sedimentation Control permits to ensure compliance with stormwater regulations
- Serve on stormwater committee

Forest Akers Golf Course (Ron Lewis)

- Ensure good housekeeping practices for stormwater control
- Mandate stormwater training for selected staff members at least once per permit cycle
- Track BMP maintenance
- Track fertilizer applications

Athletics (Andy Flynn)
- Ensure good housekeeping practices for stormwater control
- Track fertilizer applications
- Mandate stormwater training for selected staff members at least once per permit cycle

IPF Campus Sustainability (Amy Butler)
- Include stormwater information on Be Spartan Green website, and include links to other sources of stormwater information
- Periodically track University-owned rolloff bins for proper use (Kris Jolley)

Residential and Hospitality Services (Joe Petroff and Carla Iansiti)
- Mandate stormwater training for selected staff members at least once per permit cycle
- Regularly clean grease traps and work with IPF to track in database
- Encourage additional training for RHS Environmental Stewards

MSU Police (Stephanie O'Donnell)
- Incorporate stormwater controls into MSU parking system
- Serve on stormwater committee

MSU Stormwater Committee Members:
John LeFevre (Chair), Dave Wilber, Steve Troost, Jeremiah Saier, Mary Lindsey, Nick Walton, Ben Darling, Ruth Kline-Robach

MSU Stormwater Committee Responsibilities
- Meet monthly to review and approve stormwater control designs for new development projects
- Forward approvals to Campus Planning and Infrastructure Work Group
- Periodically review offset database to ensure compliance with Post Construction Controls Alternative Approach agreement with MDEQ
- Review and approve offset database summary annually
- Discuss and address campus stormwater permit issues pertaining to the federal stormwater regulation's six minimum measures:

    1) Public Education
    2) Public Involvement
    3) Illicit Discharge Detection and Elimination
    4) Construction Stormwater Runoff
    5) Post Construction Stormwater Runoff
    6) Pollution Prevention and Good Housekeeping

APPENDIX B

MSU Stormwater Outfalls

Michigan State University Stormater Management Program

Stormwater Outfalls

Shaded outfalls are either abandoned or not owned by MSU.

Outfall Number	Diameter (in)	Owner	*Easting	*Northing	Status	District	Comment
1	36	E Lansing	13088057	448212	Active		Outside Campus boundary
2	27	MSU	13088115	448196	Active	Red Cedar River Via Campus Outfalls	
3	10	MSU	13088438	448183	Active	Red Cedar River Via Campus Outfalls	
5	15	MSU	13088950	448175	Active	Red Cedar River Via Campus Outfalls	Diameter per 2002 report, not listed in GIS
6	12	MSU	13089106	448222	Active	Red Cedar River Via Campus Outfalls	Diameter per 2002 report, not listed in GIS
7	12	MSU	13089171	448228	Active	Red Cedar River Via Campus Outfalls	Diameter per 2002 report, not listed in GIS
8	18	MSU	13089511	448273	Active	Red Cedar River Via Campus Outfalls	Diameter per 2002 report, not listed in GIS
9	42	MSU	13089632	448673	Active	Red Cedar River Via Campus Outfalls	
10	10	MSU	13089353	449264	Active	Red Cedar River Via Campus Outfalls	Diameter per 2002 report, not listed in GIS
11	10	E Lansing	13089304	449398	Active		Diameter per 2002 report, not listed in GIS
12	36	MSU	13090892	449226	Active	Red Cedar River Via Campus Outfalls	
13		MSU			Abandoned		Replaced by Outfall 87
14	10	MSU	13090912	448937	Active	Red Cedar River Via Campus Outfalls	
15	6	MSU	13090946	448893	Active	Red Cedar River Via Campus Outfalls	
16	30	MSU	13091056	448884	Active	Red Cedar River Via Campus Outfalls	Diameter per 2002 report, not listed in GIS
17	18	MSU	13091184	448775	Active	Red Cedar River Via Campus Outfalls	
18	6	MSU	13091150	448695	Active	Red Cedar River Via Campus Outfalls	
19	15	MSU	13091346	448542	Active	Red Cedar River Via Campus Outfalls	
20	36	MSU	13091485	448410	Active	Red Cedar River Via Campus Outfalls	
21	15	MSU	13091865	448261	Active	Red Cedar River Via Campus Outfalls	
22	6	MSU	13091876	448160	Active	Red Cedar River Via Campus Outfalls	
23	12	MSU	13092597	447790	Active	Red Cedar River Via Campus Outfalls	Diameter per 2002 report, not listed in GIS
24	10	MSU	13092599	447701	Active	Red Cedar River Via Campus Outfalls	
25					Abandoned		Replaced by Outfall 56
26	24	MSU	13092766	447707	Active	Red Cedar River Via Campus Outfalls	
27	12	MSU	13092813	447575	Active	Red Cedar River Via Campus Outfalls	
28	12	MSU	13092903	447531	Active	Red Cedar River Via Campus Outfalls	
29	6	MSU	13092918	447623	Active	Red Cedar River Via Campus Outfalls	
30	12	MSU	13092966	447607	Active	Red Cedar River Via Campus Outfalls	Diameter per 2002 report, not listed in GIS
31		MSU	13093194	447406	Active	Red Cedar River Via Campus Outfalls	BMP overflow- Unknown Diameter
32	18	MSU	13093318	447451	Active	Red Cedar River Via Campus Outfalls	
33	18	MSU	13093284	447372	Active	Red Cedar River Via Campus Outfalls	
34					Deleted		Farm Lane bridge abutment-not an outfall
35					Deleted		Farm Lane bridge abutment-not an outfall
36	8	MSU	13088718	448111	Active	Red Cedar River Via Campus Outfalls	
37	72	MSU	13088977	448100	Active	Red Cedar River Via Campus Outfalls	
38	24	MSU	13089735	448334	Active	Red Cedar River Via Campus Outfalls	
39	18	MSU	13089727	448555	Active	Red Cedar River Via Campus Outfalls	
41	36	MSU	13093525	447419	Active	Red Cedar River Via Campus Outfalls	
42	36	MSU	13093536	447324	Active	Red Cedar River Via Campus Outfalls	
43	18	MSU	13093843	447297	Active	Red Cedar River Via Campus Outfalls	
44	15	MSU	13094000	447409	Active	Red Cedar River Via Campus Outfalls	
45	12	MSU	13094066	447419	Active	Red Cedar River Via Campus Outfalls	Diameter per 2002 report, not listed in GIS
46	18	MSU	13094320	447369	Active	Red Cedar River Via Campus Outfalls	
47	10	MSU	13094299	447469	Active	Red Cedar River Via Campus Outfalls	
48	10	MSU	13094342	447482	Active	Red Cedar River Via Campus Outfalls	Diameter per 2002 report, not listed in GIS
49	30	MSU	13094476	447527	Active	Red Cedar River Via Campus Outfalls	Diameter per 2002 report, not listed in GIS
50	12	MSU	13094514	447426	Active	Red Cedar River Via Campus Outfalls	
51	12	MSU	13094957	447663	Active	Red Cedar River Via Campus Outfalls	Serves bogue street/EL ROW
52	24	MSU	13095131	447583	Active	Red Cedar River Via Campus Outfalls	
53	84	MSU	13097636	447649	Active	Red Cedar River Via Campus Outfalls	Diameter per 2002 report, not listed in GIS
54	18	MSU	13091771	448214	Active	Red Cedar River Via Campus Outfalls	
55	21	MSU	13089685	448367	Active	Red Cedar River Via Campus Outfalls	Sanitary Sewer
56		MSU	13092704	447735	Active	Red Cedar River Via Campus Outfalls	Diameter not listed in GIS
57	24	MSU	13093359	447439	Active	Red Cedar River Via Campus Outfalls	Sanitary Sewer
58	84	MSU	13089306	449405	Active	Red Cedar River Via Campus Outfalls	Sanitary Sewer
59	28	MSU	13088450	448185	Active	Red Cedar River Via Campus Outfalls	Sanitary Sewer
60	12	MSU	13092404	447921	Active	Red Cedar River Via Campus Outfalls	
61		MSU			Abandoned		
62		MSU			Abandoned		Sanitary Sewer
63		MSU	13089611	448739	Deleted		Bridge abutment, not an outfall
64		MSU	13089681	448761	Deleted		Bridge abutment, not an outfall
65		E Lansing	13089601	449535	Active		
66		MSU			Abandoned		
67		MSU			Abandoned		
68		MSU			Abandoned		
69		MSU			Abandoned		
71		MSU			Abandoned		
72		MSU	13091906	448250	Deleted		Bridge abutment, not an outfall
74		E Lansing			Abandoned		Sanitary Sewer
75		E Lansing	13089828	449582	Active		
76		MSU			Abandoned		
77		MSU			Abandoned		
78		MSU			Abandoned		
79		MSU			Abandoned		
80		E Lansing			Active		
81		E Lansing			Active		
82		E Lansing			Active		

Outfall Number	Diameter (in)	Owner	*Easting	*Northing	Status	District	Comment
83		E Lansing			Active		
84		E Lansing			Active		
85		E Lansing			Active		
86		MSU	13089187	448164	Active	Red Cedar River Via Campus Outfalls	Added-Diameter not listed in GIS
87		MSU	13090967	448956	Active	Red Cedar River Via Campus Outfalls	Added - previously inadvertently ommitted
88	6	MSU	13091977	448102	Active	Red Cedar River Via Campus Outfalls	Added - previously inadvertently ommitted
89	6	MSU	13092127	448023	Active	Red Cedar River Via Campus Outfalls	Added - previously inadvertently ommitted
90		MSU	13092248	447933	Active	Red Cedar River Via Campus Outfalls	Added-Diameter not listed in GIS
91	4	MSU	13089449	449041	Active	Red Cedar River Via Campus Outfalls	Added - previously inadvertently ommitted
92		MSU	13087685	447712	Active	Red Cedar River Via Campus Outfalls	Added-Diameter not listed in GIS
93	24	MSU	13089207	444507	Active	Service West	Added - previously inadvertently ommitted
94	78	MSU	13087544	444503	Active	Spartan Village	Added - previously inadvertently ommitted
95	Open Drain	MSU	13086232	440994	Active	Red Cedar Tributary	Added per 2010 Urban Area
96	18	MSU	13087642	430674	Active	Pawloski Creek/Banta Drain	Added per 2010 Urban Area
97	12	MSU	13091002	426355	Active	Sycamore Creek	Added per 2010 Urban Area

* Coordinates are provided per MSU base map in Michigan State Coordinate System South Zone, NAD 83 (US Ft).

APPENDIX C

MSU Impervious Coverage

Table 1
Michigan State University
Stormwater Best Management Practices (BMPs)
2008 - 2018

Year	Building Name	Watershed District	Outfall	Project Area (AC)	Impervious area change (AC)	Runoff Coefficient	Net Impervious Change (AC)	Area Treated for 80% TSS (AC)	Comments
2018	CP11349 Wilson Rd Extention	RC	53	1.8		1.8	19.85		Porous Pavers, detention basin, hydrodynamic separators
2017	Data Center	RC		2.6		2.60	3.4		oversized detention basin for potential future expansion
2017	Spartan Stadium South Endzone Expansic	RC		0		0.00	5.5		construction within existing parking lot
2017	Parking Lot 92	RC		0.77		0.77	2.5		Porous Pavement and Hydrodynamic Separator
2017	1855 Place Development	RC		1.04		1.04	20.83		Rain Gardens, Porous Pavement and subsurface infiltration
2017	Breslin Center Parking Lot	RC		0		0.00			construction within existing parking lot
2017	Breslin Addition 2 - Hall of History	RC		0.57		0.57	19.75		
2016	Akers Golf Intercollegiate Golf Complex	RC		0		0.00	2.49		Vegetated Swale
2016	Scene Shop	RC		0.84		0.84	0.84		Detention Facilities
2016	Cata's Transportation Gateway	RC		-1.4	0.15	-1.19	7.78		Hydrodynamic Separator
2016	Bio-Engineering Facility	RC		1.01		1.01	1.01		Subsurface storage
2016	Bio-Engineering Facility	RC		0.16		0.16	0.16		flows to existing Hydrodynamic Separator
2015	Parking Lot 97 - Engineering Research	RC		-0.87	0.7	-0.261			Existing and expanded parking was built with pervious pavement. Entire area flows to Hydrodynamic Separator (Bay Saver) on Bogue south of Service
2015	Parking - Community Music School	RC		0.06		0.06			
2015	West Circle Steam Phase 4	RC				0			
2014	West Circle Steam Phase 3	RC		0.01		0.01	2.39		Majority of the site flows to existing Hydrodynamic Separator (phase 1). Additional area is being redirected to the unit with this
2014	West Circle Housing Infrastructure - Ph 2	RC				0.00			site flows to existing Hydrodynamic Separator
2014	Spartan Stadium North End Zone Addition	RC		0.51		0.51			
2013	Jenison Parking Lot (Lot 67)	RC		0.21		0.21	40		Hydrodynamic Separator installed
2013	Jenison Parking Lot (Lot 67)	RC				0.00	0.89		Hydrodynamic Separator installed
2013	Morrill Hall Demolition	RC		-0.40	0.15	-0.34	0.40		Building demolition, Area returned to green space
2013	Transportation Services Facility	RC		1.25		1.25	1.05		Hydrodynamic Separator and Subsurface Storage
2013	West Circle Steam Phase 2	RC		-0.06	0.15	-0.05	3.53		Hydrodynamic Separator installed
2013	West Circle Steam Phase 2	RC		-0.19	0.15	-0.16			Porous Pavement
2013	Shaw Hall Dining and Parking Lot Remova	RC		-1.1	0.15	-0.94			Parking lot removed - replaced with parkspace
2012	West Circle Steam - Phase 1	RC		0.00		0.00	17.80		Bay Saver
2012	West Circle Steam - Phase 1	RC		0.00		0.00	0.30		Porous Pavement
2012	Chestnut Road Reconstruction	RC		0.00		0.00	0.30		Porous Pavement
2012	Michigan State Police - Demolition	RC		-4.50	0.15	-3.83	0.00		Building and parking lot removal
2012	Wells Hall Addition	RC		0.12		0.12	0.15		Green Roof
						0.00			
2011	Brody Hall Addition	RC		0.42		0.42	0.42		Significant LID, including rain garden. Roof area deverted from capture re-use cistern (+0.29 AC) 3/24/16
2011	Cherry Lane/Faculty Bricks	RC		-10.33	0.15	-8.78			Building and parking lot removal
2011	Life Science Addition	RC		0.34		0.34	15.00		bay saver for entire sub-district installed in 2011
						0.00			
2010	Campus Police	RC		-1.20	0.15	-1.02	1.20		Porous pavement parking lot
2010	Grounds Maintenance	RC		-0.15	0.15	-0.13	0.15		Roof water re-routed to rain garden
2009	Farm Lane Underpass	RC		3.21		3.21	3.21		Significant LID, including bioretention
2009	Shooting Center	HC		0.96		0.96	0.96		Significant LID, including bio-swales
2009	Recycle and Surplus Center	RC		5.73		5.73	5.73		Significant LID, including porous pavement, detention and rain garden. Roof area diverted from capture re-use cicstern(+0.78 AC) 3/24/16
2009	Wharton Center Addition	RC		0.14		0.14			
2009	Cyclotron Addition	RC		0.11		0.11			
2009	Forest Akers East Driving Range	RC		0.32		0.32			No direct storm sewer connection
2009	Old College Field - Press box	RC		0.03		0.03			Net increase (existing building removed)
2009	Birch/Wilson Steam Tunnel	RC		0.37		0.37	26.90		Nutrient box installation for entire sub-district
2009	North Campus - Bike Pad Removal	RC		0.33		0.33			Bike lanes/pads removed
			Total Building Area			0.00			
2008	Case Hall - Add. 2 - Loading Dock	RC		0.04		0.04			
2008	Duffy Daugherty Football - Add. 4	RC		0.28		0.28			
2008	Chemistry - Add. 2	RC		0.11		0.11			
2008	Misc Minor Bldg Projects	-		0.02		0.02			
2008	Spartan Village	RC		-14.46	0.15	-12.29			Buildings and parking lots removed
						0.00			
	Sub-total completed projects 2008-2018			**-11.31**		**-5.63**	**204.49**		

KEY	
RC =	Red Cedar via campus outfall
PC =	Pawlowski Creek
RCC =	Red Cedar Area C
HC =	Herron Creek

Table 1
Impervious Change Summary
2019-2022

Year	Project Number and Name	Watershed	Outfall	Project area (AC)	Pre-Construction Impervious Area (AC)	Post-Construction Impervious Area (AC)	Net Impervious Change (AC)	Area Treated for 80% TSS (AC)	Comments
Projects in Planning, Design or Under Construction									
2023	CP18107 Farm Lane Bridge and Utilities	RC	33,41,42						TBD
2022	CP20013 TechSmith Private Office Buildi	SV	94	5.04	0.04	3.06	3.02	3.02	Subsurface infiltration system. Rain Garden/Vegetated Swale. Weighted Runoff Coefficient, C=0.67
2022	CP18024 Engineering Activities Center	RC	53		0				TBD, Development of greenspace. Building and parking. Likely vegetated swales along north edge of property similar to Scene Shop
2022	CP19012 Bogue-Service intersection	RC	53						TBD, Anticipate an overall reduction in impervious. Removal of parking. Existing large scale Bay Saver Hydrodynamic Separator within project limits.
	Sub Total in Design or Under Construction						**3.02**	**3.02**	
Completed in 2019-2020									
2020	CP17133 STEM Building	RC	22,37	4.89	2	2.88	0.88	10.72	TBD
2019	CP17077 Music Building Addition	RC	12b,16				0.41	0	Purchase from regional bank approved. Site is within watershed of existing hydrodynamic separator
2019	CP16086 Water Treatment Plant and Tov	RC	37	2.73	0	1.51	1.51	1.51	detention basin
2019	CP14217 Business College Pavillion	RC	50,52	3.2	0.98	1.56	0.58	0.7	73% purchase from regional bank approved.subsurface infiltration, bio-swales
2019	CP16304 Interdisciplinary Science & Tech	RC	53	7.2	3.85	4.13	0.28	7.0	TBD, Minimal Net Change, subsurface infiltration
2019	CP09298 FRIB	RC	52,53				2.07	0	Transfer from Bank
	Sub Total - 2019-2020						**5.73**	**19.93**	
	Sub Total - 2008-2018						**-5.63**	**204.49**	

KEY
RC = Red Cedar via campus outfall
PC = Pawlowski Creek
RCC = Red Cedar Area C
HC = Herron Creek

Total change since 01/01/2008 **0.10** **224.42**

Note: Runoff Coefficients (C-Values) are based on MSU Storm Water Design Standards, Table 9 - Rational Method Runoff Coefficients.

APPENDIX D

MSU Good Housekeeping/Pollution Prevention Standard Operating Procedures

MSU Standard Operating Procedures 2021
Good Housekeeping and Pollution Prevention Activities
Infrastructure Planning and Facilities - Landscape Services

Oversight by: Matt Fehrenbach

Controls used for Reducing/Eliminating the Discharge of Pollutants from Streets, Roads, Highways, Parking Lots & Maintenance Garages

- **What types of BMPs are used for the following activities:**
  - Concrete Cutting – contractors utilize a wet-saw and shop vac areas when completed
  - Sidewalk Repairs – contractors install silt-sacks in CB's, erosion eels at low points in walks to reduce run-off.
  - Asphalt Patching – contractors install silt-sacks in CB's, erosion eels at low points in pavement as necessary.
  - Curb and Gutter Repair – contractors install silt-sacks in CB's, erosion eels as needed.

Catch Basin Cleaning (how many are owned, cleaning schedule, targeted areas, tracking and record keeping)

- Utilize CB Inspection and CB Cleaning Collector Application.
- Inspect all CB's on an annual basis to determine amount of debris in sump. If sump is more than half full, schedule CB for cleaning.
- Clean identified CB's as needed and record total amount of debris collected on an annual basis and add to spreadsheet located: L:Lawver/Hard Surface Crew Documents/Catch Basin Cleaning/ CB Cleaning Volume History
- CB's located within construction sites are monitored by the SESC plan and inspected post construction. If sumps are more than 50% full, CB is scheduled for cleaning.
- CB cleaning contractor utilizes Collector app to locate and document cleaning activities.
- History of when each structure was cleaned and inspected for past couple of years were uploaded into CB Cleaning app.

Oil/Water Separator Cleaning (maintenance procedures, disposal of waste, record keeping)

- Maintenance Procedures- See Appendix 6 in SWPPI
- Waste is disposed of in two ways- surface parking lots and parking ramp waste are treated differently. See Appendix 6 in SWPPI
- Diesel fuel pump area with secondary containment. Monitored daily, spills cleaned up, sheen removed from water before draining into separator with absorbent added and then to sanitary sewer.
- All structures are monitored every 6 months and oil absorbent pads replaced as needed.
- Maintenance history is included in Collector Application.

Parking Lot Sweeping (schedule, disposal of debris, record keeping)

- Parking lot sweeping is primarily done during spring, summer and fall with winter cleaning done on an as needed basis. Cleaning is prioritized in the spring starting with lots that have a larger amount of debris on them and then parking areas near Commencement Sites are cleaned. The remainder of the parking lots are done after that throughout the summer. Like street sweeping, parking lot sweeping is an ongoing project throughout the year and we are constantly monitoring the parking lots and keeping them clean and safe.
- All debris from parking lot sweeping is landfilled and collected in a 10 yard roll-off bin staged at the Landscape Services Building and is used only for street sweepings.

- Maintenance location maps are documented by hand from the operators and then digitized in the computer and filed in GroundsHomeDir$:/Lawver/Hard Surface Crew Documents/Street Sweeping/ then the year. We also save an Excel spreadsheet of the total amount of debris collected from CB waste and Oil Separator waste in this folder also.

Parking Structure Cleaning (schedule, disposal of debris, BMP's to protect storm drain inlets)

- Parking ramps are swept throughout the year on an as-needed basis and washed, using a machine mounted pressure washer, during the summer months.
- All debris gathered from the parking deck sweeping is landfilled and collected in a 10 yard roll-off bin staged at the Landscape Services Building.
- The Grand River Ramp (#6) and the Shaw Ramp (#1) have storm separators installed to help treat the storm water. Each oil separator is cleaned on an annual basis through our contractor utilizing the Collector App.
- Big Orange E which contains natural citrus solvents is used in conjunction with pressure washing in all parking ramps. Big Orange E is a non-petroleum degreaser and is completely biodegradable.
- Where applicable, drain socks or other catchment devices are used to stop sediment from entering storm drains while pressure washing.

Street Sweeping (schedule, types of sweepers, disposal of debris, record keeping, evaluation of effectiveness)

- Street sweeping is primarily done during spring, summer and fall with winter cleaning done on an as needed basis. Cleaning is prioritized in the spring starting with streets that have a larger amount of debris on them and then streets near Commencement Sites are cleaned. The remainder of the roads are done after that with the goal of having all streets initially swept by the end of May. Street sweeping is an ongoing project throughout the spring, summer and fall and we are constantly monitoring the streets and keeping them clean and safe.
- We utilize one large sweeper (Johnston) and one small vacuum (Tennant 636 Green Machine).
- We utilize a tractor with a blower to blow leaves and other organic material that falls in the roadways and parking lots back onto lawn areas which are then mown with mulching deck mowers to reduce the amount of organic debris that ends up in CB's and to maintain safe bicycle lanes.
- All debris from parking lot sweeping is landfilled and collected in a 10 yard roll-off bin staged at the Landscape Services Building and is used only for street sweepings.
- Maintenance location maps are documented by hand from the operators and then digitized in the computer and filed in L:Lawver/Hard Surface Crew Documents/Street Sweeping/ then the year. We also save an Excel spreadsheet of the total amount of debris collected from CB waste and Oil Separator waste in this folder also.

Oversight by: Dennis Consavage

Maintenance Garages and Storage Yards (chemical/bulk storage, vehicle washing, spill kits, sanding/grinding waste disposal, vehicle maintenance, oil filter disposal, storm drain inlet maintenance, yard sweeping)

- All chemicals are stored in flame proof cabinets (with built-in containment) and bulk oil is stored in oil room.
- Vehicles are all washed in areas that are plumbed to sanitary sewer. No storm sewer connections.
- Spill kits are located around shop for easy access.
- Wastes from sanding and grinding are disposed of in landfill.
- Oil filters are crushed and recycled.
- All drains inside garage and in vehicle storage area are plumbed into sanitary sewer and all are cleaned regularly.
- The yard around our maintenance garage is swept (vacuumed) regularly as well as inside the shop.

Disposal of Operation and Maintenance Waste (dredge spoil, accumulated sediments, floatables, other debris)

- All maintenance waste is land filled.

Oversight by: John Jonckheere

Deicing Activities (typed of deicing agents used, storage, tracking of locations/volumes calibration of trucks)

- All documents are stored in L: MASTER SNOW PLAN/ then by the specific year
- Sodium Chloride- Rock Salt
- Sodium Chloride Brine- made from rock salt to 23.3% salinity
- Sno-N-Ice Melter- blend – "green" in color and utilized at building entrances so customers can see it and don't think they need to spread more salt.
- All granular (bulk and bagged) product is stored in covered buildings. Liquid product is stored in tanks with secondary containment. Total volumes of material used are documented.
- Large salt trucks are calibrated at the beginning of each season and gates are locked to keep calibration accurate.
- Storage is in accordance with the MDEQ Salt and Brine Storage Guidelines.

Snow Removal (snow piling and disposal)

- Please go to http://ipf.msu.edu/green/practices/snow-removal.html to review the campus snow removal plan outlining each departments responsibility and a video to explain the process.
- Review snow maps and snow piling locations indicated on individual route maps: L: MASTER SNOW PLAN/ then by the specific year

Oversight by: Jerry Wahl, Scott Feick, Josh Ridner and Paul Harper

Pesticide, Herbicide and Fertilizer Applications

Certification of applicators

- All applicators are required to have a Michigan Pesticide Applicators Certificate with endorsements in categories 3A (turf), 3B (ornamentals) and 6 (right-of-way), 7 (Mosquito)

Chemical Storage

- Self-contained safety designed storage unit inside building with designed mix and fill pad
- Fertilizer stored in secured building separate from chemical storage
- Minimum amounts stored for time delivery and application

Application plans

- Pre-emergent herbicide with fertilizer last week in March to end of May
- Grub control with fertilizer applied late July to early August
- Growth regulator applied late April to early June
- Post emergent herbicide applied late May to late September
- Dormant application of fertilizer applied late October thru November
- Applications pending environmental and turf conditions
- Insect and disease control products are only applied after inspection and diagnose of pest problems.

- Many insect and disease problems in trees are being controlled by trunk injection of pesticides. No environmental release of product occurs.
- Tree fertilizers are soil injected in controlled amounts in water suspension, 6-10 inches below the surface to target the root zone.
- All application of foliar is limited near the river.

IPM activities

- Continues monitoring by turf crew and additional observations/input from gardening staff
- Mapping of areas for level of maintenance and usage
- Arborists monitor and control insects and diseases by removing infected plant and material. (Sanitation pruning)
- Insects are targeted. Blanket sprays are not conducted.
- Use of cultural methods to stimulate the health of the plants to promote their resistance of diseases and insects.

Alternative landscaping

- Artificial playing fields as funding allows
- Brick and stone mulch instead of bark mulch.

Educational activities for applicators

- Continuing education classes offered each year by university staff and agricultural extension.
- Attend regional trade shows
- Attend seminars put on by professional organizations
- CEU's are continually being attained to maintain ISA certification and the Commercial Pesticide Applicators certificate.

BMP's in right-of ways and playing fields

- Application pending on wind and temperature conditions
- Avoid/remove all fertilizer from hard surfaces areas
- Mark all areas of applications
- Recalibration of equipment every 2 weeks or as needed
- Daily log of applications, volume, location, rates and weather conditions

Oversight by: Paul Harper, Josh Ridner, Scott Feick & Steve Wallace

Grassed Swales, Rain Gardens, Pond Perimeters, Other Vegetated Controls Maintenance

Grassed Swales

- Mapping of swales are included in the campus low-mow areas
- Areas are mowed 1-2 times annually

Rain Gardens

- Mapping of rain gardens is performed during the construction process and added to the campus base map and Collector App.
- The gardening staff is responsible for weeding, pruning, mulching, and litter control on a daily/weekly basis.
- Annual inspections will be performed in the spring and fall to verify invasive weeds, monitor sediment levels and check invert out structure/pipe for blockages.

Pond Perimeters

- Retention and Detention ponds are mapped and entered into the campus database.
- The gardening staff is responsible for maintaining the buffer zone of plant material.
- The mowing staff are responsible for maintaining the low-mow buffer zone along the perimeter

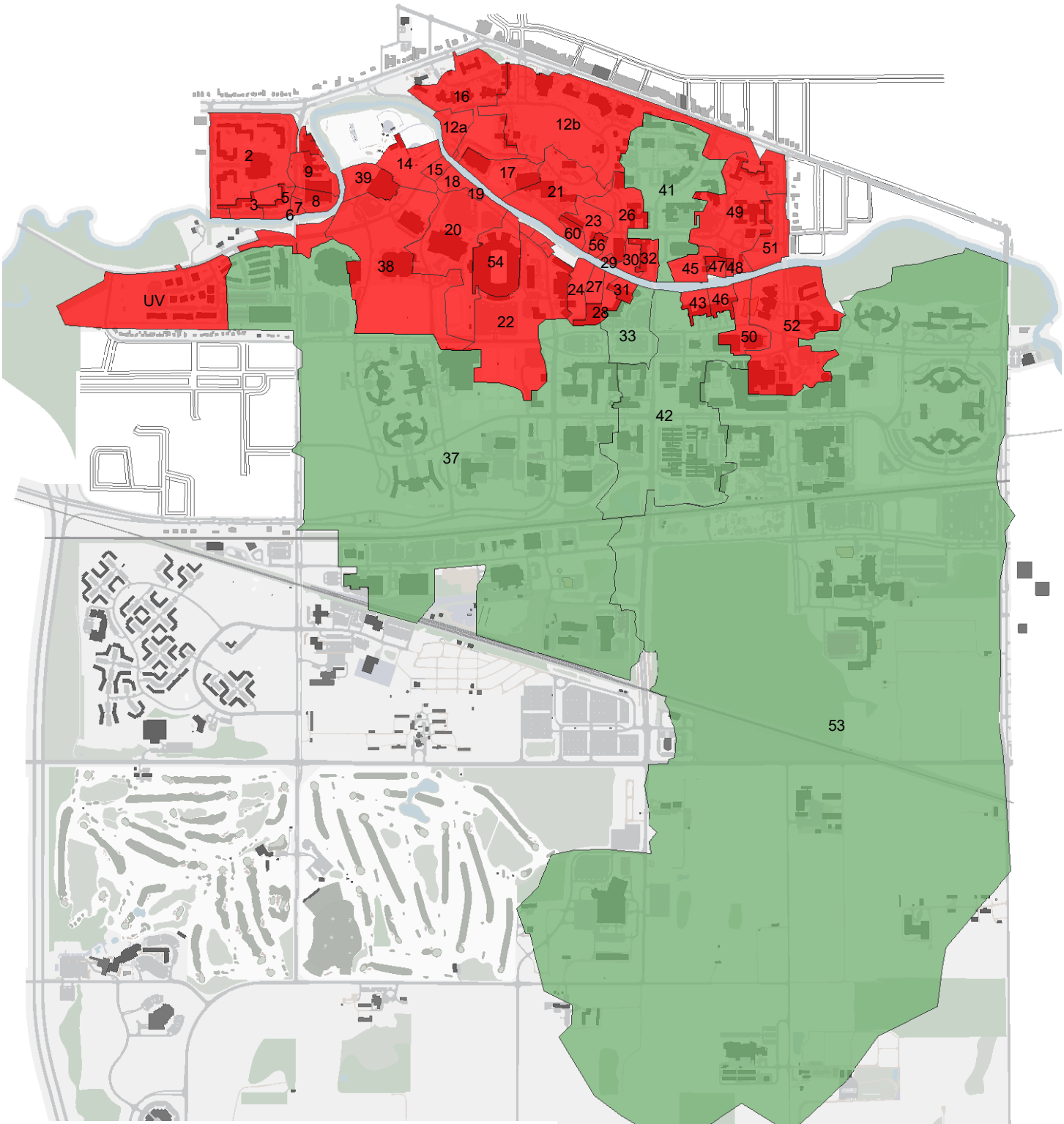
Yard Debris Reduction and Disposal (mulching/composting, leaf litter removal)

- Mowers are outfitted with mulching decks which reduce the amount of grass trimmings collected annually. There are only a few sites in which we collect the trimmings and take out to the Beaumont Topsoil Facility to combine with topsoil to add organic material.
- All campus hardwood trimmings/brush and wood debris is stockpiled at the TB Simon Power Plant and tub-ground on a semi-annual basis. The woodchips are then hauled away by the tub-grinding contractor to sell.
- Woodchips are purchased in through a blanket purchase order contract, stockpiled at Beaumont and issued out to the gardening staff and landscape staff on a per project or location basis.
- Leaf litter is performed in the fall and early spring by the gardening, mowing, and hard surface crew staff. The leaves collected in the streets and curbs are blown into the lawn panels by a tractor and blower to reduce the amount of leaves entering the storm drainage system. The mowers outfitted with mulching decks chop up the majority of leaf matter. Leaves collected in landscape beds are taken out to Beaumont and mixed in with the topsoil to add organic matter.

APPENDIX E

MSU Total Maximum Daily Load Sampling Coverage

MICHIGAN STATE UNIVERSITY



DISTRICT AREAS AND PERCENTAGE

Sampled Outfall Districts

2510 Acres 78%

Unsampled Outfall Districts

718 Acres 22%

MSU Infrastructure Planning and Facilities