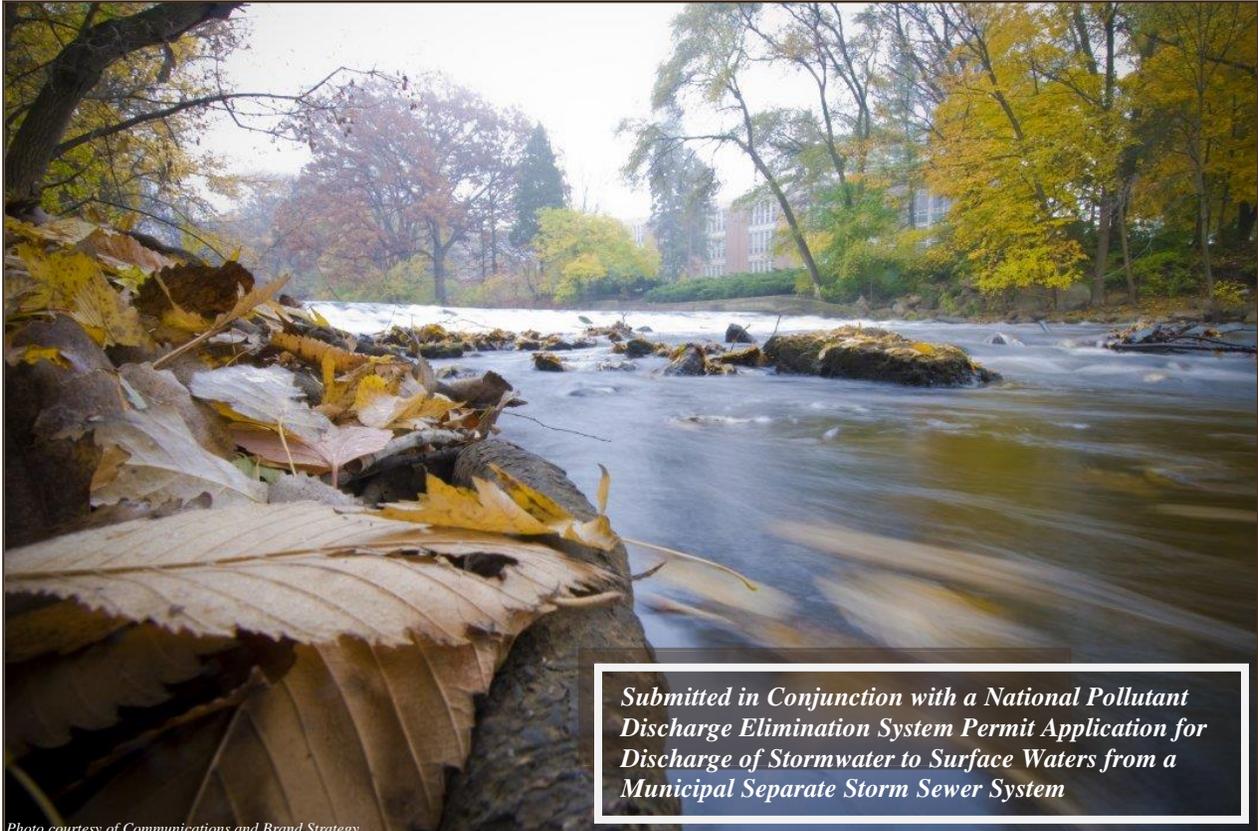


Michigan State University Stormwater Management Program



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Chapter 1 - Stormwater Management Program (SWMP) Overview

This Stormwater Management Program (SWMP) has been developed by Michigan State University (MSU) in accordance with the requirements of the State of Michigan National Pollutant Discharge Elimination System (NPDES). The NPDES Program protects the surface waters of the state by assuring that discharges of wastewater comply with state and federal regulations. Anyone discharging or proposing to discharge wastewater to the surface waters of the state shall make application for and obtain a valid NPDES permit prior to the wastewater discharge. NPDES permits are required under Section 402 of the Federal Clean Water Act (the Federal Act), as amended (33 U.S.C. 1251 et seq., P.L. 92-500, 95-217), and under Part 31, Water Resources Protection, of Michigan's Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (the Michigan Act). Part 31 of the Michigan Act also provides authority for the State to issue NPDES permits. The Michigan Department of Environmental Quality (MDEQ) administers the NPDES permit program for the State of Michigan.

The SWMP contains language referring to the State of Michigan Application for Discharge of Stormwater to Surface Waters from a Municipal Separate Storm Sewer System (MS4). The MSU East Lansing campus is located in the Lower Red Cedar River Watershed, and stormwater discharges to the Red Cedar River.

MSU is working to meet its permit requirements by implementing campus-based stormwater management activities and collaborative activities with other communities within the Red Cedar River Watershed. 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 communities within the Greater Lansing Region. The committee has been established to guide the implementation of the stormwater programs for the communities within three identified urbanized watersheds: the Grand River, the Red Cedar River and the Looking Glass River watersheds.

GLRC Members

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

- City of DeWitt
- City of East Lansing
- City of Grand Ledge
- City of Lansing
- Meridian Charter Township
- Oneida Charter Township
- Michigan State University
- Lansing Public Schools

- City of Mason
- Delhi Charter Township
- Delta Charter Township
- DeWitt Charter Township
- Lansing Charter Township
- Windsor Charter Township
- Clinton County
- Eaton County
- Ingham County

Within the GLRC, a number of committees have been established to guide various components of the regional stormwater activities, with others added as needed. MSU plays an active role crafting and implementing GLRC stormwater activities with partnering communities. A list of action items for meeting the stormwater permit requirements is detailed in the Action Plan Table, which is included as Appendix 1.

While many of the activities listed are being completed by various GLRC committees, a number of the action items are the responsibility of the individual permittees. Those activities from the GLRC Action Plan Table to which MSU has committed and that are directly applicable to the stormwater permit requirements are described in this SWMP.

Campus Stormwater Management and MSU Stormwater Committee

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 include the Office of Environmental Health and Safety (EHS), IPF Engineering and Architectural Services, IPF Landscape Services, IPF Power and Water, Land Management Office, MSU Athletics, Campus Planning and Administration, Office of Campus Sustainability, Residential and Hospitality Services, Institute of Water Research, MSU Police, Department of Community, Agriculture, Recreation and Resource Studies, Department of Biosystems and Agricultural Engineering, and Department of Horticulture. A summary of roles and responsibilities for campus stormwater management is included as Appendix 2.

A Stormwater Committee comprised of a subset of these representatives and chaired by the University Engineer guides the implementation of the SWMP. The committee meets monthly to oversee SWMP activities and to direct additional campus-based stormwater activities

Regulated Area

MSU is located in the Greater Lansing urbanized area, as delineated in the 2000 Census. The MSU regulated area is shown in the map which is included in Appendix 3.

Outfalls and Points of Discharge

The Red Cedar River is the discharge point for MSU's MS4 discharges. The University's discharge database and outfall maps are included as Appendix 4.

Enforcement Response Procedure

Environmental compliance staff members from EHS have the authority to inspect and monitor stormwater-related activities on campus and require full compliance with all stormwater permit requirements. Any issues noted through the monitoring and inspection process are immediately shared with representatives from the MSU IPF, which then take necessary corrective actions. If necessary, the violation/issue is reviewed with the Stormwater Committee to discuss appropriate corrective actions and associated timelines. Records of any violations or other issues and corrective actions are maintained by EHS. Those records include the date and location of the violation/issue, a description of the violation/issue, a schedule for returning to compliance and the date the violation/issue was resolved.

Authority is granted to EHS, MSU IPF and the MSU Stormwater Committee through reporting lines to both the Office of the Vice President for Research and Graduate Studies and the Office of the Vice President for Strategic Infrastructure Planning and Facilities.

Stormwater Management Program Components

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 Plan (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.

These SWMP components are detailed in the chapters that follow.

Chapter 2 - Public Education Plan

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 to meet the intent of the stormwater permit.

MSU's PEP is designed to raise awareness among faculty, staff, students and visitors to campus about the importance of the Red Cedar River and ways to protect water quality. Initial public education activities focused on relatively simple concepts, such as "Watershed Awareness," "Stormwater Management" and "Our Actions Affect the River." Current and planned outreach activities are emphasizing the importance of reporting illicit discharges and specific best management practices that can be undertaken to protect water quality. The University is implementing the PEP in collaboration with the Greater Lansing Regional Committee for Stormwater Management (GLRC) to comply with the stormwater permit requirements.

Required Topic Areas

The PEP has been developed to ensure that the targeted audiences are reached and includes the eleven topic areas required in the permit:

An adequate PEP will implement a sufficient amount of educational activities to ensure that the targeted audiences are reached with the appropriate message(s) for the following topics:

- (A) *Promote public responsibility and stewardship in the applicant's watershed(s).*
- (B) *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.*
- (C) *Educate the public on illicit discharges and promote public reporting of illicit discharges and improper disposal of materials into the MS4.*
- (D) *Promote preferred cleaning materials and procedures for car, pavement, and power washing.*
- (E) *Inform and educate the public on proper application and disposal of pesticides, herbicides, and fertilizers.*

- (F) *Promote proper disposal practices for grass clippings, leaf litter, and animal wastes that may enter into the MS4.*
- (G) *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.*
- (H) *Inform and educate the public on proper septic system care and maintenance, and how to recognize system failure.*
- (I) *Educate the public on, and promote the benefits of, green infrastructure and Low Impact Development.*
- (J) *Promote methods for managing riparian lands to protect water quality.*
- (K) *Identify and educate commercial, industrial, and institutional entities likely to contribute pollutants to stormwater runoff.*

Public Participation/Involvement

As required, the Stormwater Management Program (SWMP) will be made available to the public via the MSU-WATER website. Local public notice requirements will be met as appropriate. The SWMP and appropriate contact information will be included to encourage public review. The public will be invited to participate in the implementation and periodic review of the SWMP. In addition, progress reports will be included on the website after submittal to the MDEQ.

In addition, the GLRC PEP and other appropriate supporting documents will be posted on the GLRC website. The GLRC website serves as a tool for information sharing with the public. All GLRC documents (template manuals, progress reports, implementation materials, brochures, quarterly newsletters, annual reports, etc.) are available on the website. The GLRC maintains a calendar for sharing public meeting information, workshops, trainings and events. The GLRC also recognizes the importance of social media. Facebook and Twitter accounts are used to reach a variety of demographics expand the reach. The GLRC will continue to utilize social media as a communication and outreach tool.

GLRC Topic Prioritization and PEP Evaluation

Evaluation mechanisms are essential to assess the effectiveness of public education programs. Identification of quantifiable measures provides both measurability and accountability for program activities. The GLRC conducted a water quality survey of residents in fall 2006. The purpose of the survey was to provide a benchmark to gauge the effectiveness of regional and local public outreach campaigns on water quality issues in the Greater Lansing Region. The survey results provided a baseline for evaluating the effectiveness of regional and local water quality initiatives over time. These results have been used by the GLRC and other organizations in the region to prioritize and implement public education programs through the most effective and efficient methods possible.

With the baseline survey completed in 2006, the GLRC committed to conducting the survey again in 2012 to identify successes related to the current public education efforts and areas for improvement. The 2012 survey was conducted in the same manner as the 2006 survey. The results were carefully reviewed by the PEP Committee, which meets on a regular basis to discuss the progress of ongoing activities, review current priorities, track measureable goals and explore new educational opportunities. The 2006 and 2012 survey results can be found at the following website:

<http://mywatersheds.org/resources/publications/>

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

High priority topics areas include:

- (B) *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.*
- (C) *Educate the public on illicit discharges and promote public reporting of illicit discharges and improper disposal of materials into the MS4.*
- (I) *Educate the public on, and promote the benefits of, green infrastructure and Low Impact Development.*

The GLRC will report on the measureable goals achieved during the regular Progress Report submissions. In addition, the GLRC PEP Committee will conduct a follow up survey to be completed when approaching the end of the permit cycle. The survey will be used to evaluate successes and challenges and to determine the overall effectiveness of the PEP. The GLRC is also working with several partners in the larger surrounding area to accomplish a variety of public education efforts. The Middle Grand River Organization of Watersheds (MGROW) is developing a regional public education campaign to provide educational resources for smaller watershed groups (including the GLRC, friends groups, Middle Grand River Watershed Management Planning Project (319) and the Red Cedar River Watershed Management Planning Project (319)). The GLRC will work with MGROW and the 319 groups to develop consistent, meaningful public education messages and delivery mechanisms that will benefit the entire region. This effort will incorporate the GLRC survey results and several other survey results in the region.

The MSU PEP is designed to raise awareness among faculty, staff, students and visitors to campus about the importance of the Red Cedar River and ways to protect water quality. 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.

PEP Implementation Plan

Activities listed below correspond directly with the eleven topic areas A - K for compliance. For all applicable topics, the PEP identifies:

1. Target audiences
2. Applicable topic areas and priority level
3. Key messages
4. Delivery mechanisms
5. Timetable
6. Responsible party (or parties)
7. Evaluation techniques

(A) Promote public responsibility and stewardship in the applicant's watershed(s).

Activity:	Continue to maintain watershed signage at road and river crossings.
Corr. Topic area:	A, C
Priority:	Medium
Target Audience:	Public
Key message:	Promoting local water resources, connecting the public to their surrounding environment. Signs read "Please Protect the Red Cedar River Watershed."
Delivery Mech.	Passing vehicles, people biking, walking or running will view the signs.
Timetable:	Signs are in place and maintained by Landscape Services
Responsibility:	MSU Landscape Services
Evaluation:	Estimated number of public exposed to the signage.
Activity:	Use "Do you know your watershed?" brochure and update as appropriate.
Corr. Topic area:	B
Priority:	Medium
Target audience:	Public
Key message:	The brochure educates the public about what a watershed is, our local watersheds and general information about watershed protection.
Delivery Mech:	Posted on the GLRC website, handed out at public events, posted in community lobbies.
Timetable:	The brochure will be used at all public events (Adopt A River, Quiet Water Symposium, Michigan Water Environment Association (MWEA) Watershed Summit), and updated as appropriate.
Responsibility:	PEP Committee and MSU
Evaluation:	Number of brochures provided throughout the year and website link traffic.
Activity:	Support and promote Mid-Michigan Environmental Action Council (Mid-MEAC) in their volunteer stream monitoring efforts.
Corr. Topic area(s):	C, J

Priority: Medium

Target audience: Public – recruiting volunteers for action.

Key message: Educate the public (volunteers) about macroinvertebrates and why they are an important indicator of water quality. This provides an opportunity to discuss pollutant sources and reporting of illicit discharges and riparian buffer purpose and management.

Delivery Mech: Direct communication with volunteers, recruitment through events (when using the educational display, GLRC website and social media postings.

Timetable: Macroinvertebrate collections are done annually in the spring and fall, identification is completed in the fall.

Responsibility: GLRC Coordinator

Evaluation: Number of volunteers participating in the collections and identification of macroinvertebrates.

Activity: Use informational display and handout materials for use at various campus events.

Corr. Topic area: B, C, I

Priority: Medium

Target audience: MSU Students faculty, staff and visitors to campus

Key message: Our actions affect our local watersheds; report illicit discharges; take individual action to protect water quality

Delivery Mech: The displays are used at many local events including the river cleanup events, Grandparents University, Autumnfest, and others as identified. Brochures, stickers, bookmarks, etc. are distributed at the events.

Timetable: Displays were created in the first permit cycle. Events occur annually

Responsibility: MSU IWR

Evaluation: Number of events and potential foot traffic, general conversations with the public. Review website traffic after an event to see if correspondents visited the website.

Activity: Update basic educational graphic with tag line and GLRC website

Corr. Topic area(s): B, C, D, E, F, G, H, I, J, K (all)

Priority: Medium

Target audience: Public

Key message: The current tag line reads “It all ends up in the Grand River”, demonstrating that what we put on land affects the water. The website is also listed which directs the public to information that covers all topic areas listed in this plan.

Delivery Mech: The 2013 billboard posting will direct viewers to the website. Other media will also be used with the graphic to direct people to the website.

Timetable: 2013 billboard posting for the months of March and April. The graphic will be updated in 2014.

Responsibility: PEP Committee

Evaluation: Website link traffic.

Activity: Utilize existing news articles and update them to be more flexible with different media outlets (Twitter, shorter columns, etc.).

Corr. Topic area(s): B, C, D, E, F, G, H, I, J, K (all)

Priority: Medium

Target audience: Public, elected officials

Key message: Articles cover the following topics:

What is a Watershed	Pet Waste
Riparian Areas	Storm v. Sanitary Sewer
Who/What is the GLRC	Car Washing
Onsite Septic Systems	Adopt Your Catch Basin
Fertilizers	Illicit Discharges
Vehicle Maintenance	Wetlands

Delivery Mech: Articles (including a posting timeline) are posted on the GLRC website, community websites and newspapers.

Timetable: Continue to maintain articles on the GLRC website. The articles are also included on the MSU-WATER website at the following URL: <http://www.msu-water.msu.edu/RedCedarRiver/Article.asp>
Update/reformatting is scheduled for 2014. News articles will be posted monthly through social media throughout the permit cycle.

Responsibility: GLRC Coordinator, PEP Committee and MSU-IWR

Evaluation: Number of articles posted and website statistics.

Activity: Children’s Water Festival Participation

Corr. Topic area(s): B, C, D, E, F, G, H, I, J, K (all)

Priority: Medium

Target audience: Elementary students, teachers and parents

Key message: Water resource awareness, pollution prevention, source water protection, water conservation, infiltration, etc.

Delivery Mech: Direct communication with teachers (mail, phone, etc.)

Timetable: This is anticipated to be an annual event as in previous permit cycles

Responsibility: GLRC Coordinator; The University provides financial support, offers several volunteer presenters for the festival, and provides the venue for the event.

Evaluation: Number of participants including students, teachers, presenters, etc.

Activity: Red Cedar River Cleanup Events

Corr. Topic Area(s): B, C, I

Priority: Medium

Target Audience: Students, visitors, faculty and staff

Key Message: Individual involvement in stewardship has a synergistic effect

Delivery Mech: Faculty will work with the MSU Fisheries and Wildlife Club, Residential Instruction on the Study of the Environment (RISE) and other student organizations as they are identified to host fall and spring cleanup events

on the Red Cedar River.

Timetable: Minimum of once each fall semester

Responsibility: Student organizations, Landscape Services, Residential and Hospitality Services, Surplus Store & Recycling Center

Evaluation: Summary of materials collected and number of volunteers

Activity: Website Development

Corr. Topic Area(s): B, C, D, E, F, G, H, I, J, K (all)

Priority: Medium

Target Audience: Students, faculty, staff, citizens

Key Message: Watershed management is an important concept; MSU is taking a proactive approach toward it.

Delivery Mech.: Various campus service units will contribute information regarding their activities that can be included on a project website.

Timetable: The website will be updated according to the following schedule:

- Contract development with MSU RSGIS – Jan 2014
- Content audit and site planning –Feb/Mar 2014
- Initial visual design Mar 2014
- Design/layout alterations Mar/Apr 2014
- Final design Apr 2014
- Installation of PHP and MySQL Apr 2014
- Ongoing site maintenance and updates – Ongoing throughout permit cycle

Responsibility: MSU Institute of Water Research (IWR)

Evaluation: Website statistics

(B) 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.

Activity: Affix curb markers to catch basins

Corr. Topic area: A, C

Priority: High

Target Audience: Students, faculty, staff, visitors

Key message: Bring awareness to the general public that storm drains flow to waterways of the state, to not dump pollutants into the drains.

Delivery Mech. Continue the campus curb marker labeling program, and provide ongoing maintenance for catch basin curb markers.

Timetable: Continued from second permit cycle.

Responsibility: MSU Environmental Health and Safety (EHS) and IWR

Evaluation: Map updates of maintenance activities. Curb markers are checked each summer season, with a replacement rate of approximately 20% across the MSU campus.

Activity: Student Outreach

Corr. topic area: A,C

Priority: High

Target audience: Students (both on- and off- campus)
Key message: Stormwater runoff and how students can play a role in protecting water quality
Delivery Mech.: Displays at RHS Neighborhood Engagement Centers
Timetable: Set up booth at three Engagement Centers over the permit cycle, beginning in 2014 academic year
Responsibility: Residential and Hospitality Services, MSU-IWR
Evaluation: Track numbers of students visiting display

Activity: GLRC webpage titled “My Watershed”
Corr. Topic area: A
Priority: High
Target audience: Public, elected officials
Key message: This section of the website promotes watershed health information, describes what citizens can do, how our water is impacted, etc.
Delivery Mech. GLRC website and social media, community website link to the GLRC webpage
Timetable: Continuous posting on the website, update as appropriate.
Responsibility: GLRC Coordinator
Evaluation: Website statistics.

Activity: GLRC quarterly newsletters and annual report
Corr. Topic area(s): A, C, D, E, F, G, H, I, J, K (all)
Priority: High
Target audience: Public, elected officials
Key message: The newsletters and annual report provide information on specific GLRC activities/events related to the six minimum measures. It also provides information related to relevant partner events and activities. It serves to educate municipal staff, elected officials, and also the public.
Delivery Mech. GLRC website, social media, and links on the MSU-WATER website.
Timetable: Ongoing, newsletters are completed quarterly and the annual report is completed after the first of the calendar year. A link to the most recent issue of the GLRC newsletter is located at the following URL:
<http://www.msu-water.msu.edu/news-events>
In addition, the Infrastructure Planning and Facilities (IPF) website provides a link to the newsletter on the GLRC website:
<http://ipf.msu.edu/green/water/protection.html>
Responsibility: GLRC Coordinator and MSU-IWR
Evaluation: Website statistics

(C) Educate the public on illicit discharges and promote public reporting of illicit discharges and improper disposal of materials into the MS4.

Activity: Maintain the GLRC website for community-specific pollution reporting phone numbers for illicit discharges.

Corr. Topic area: N/A
Priority: High
Target audience: Public
Key message: To report illicit discharges (description provided), illegal dumping, etc.
Delivery Mech. GLRC website and social media, MSU IPF website
Timetable: Currently in place, ongoing activity.
Responsibility: GLRC Coordinator, PEP Committee, MSU IPF
Evaluation: Website link traffic.

Activity: Employee Information Dissemination – Written Materials
Corr. Topic Area(s): A, B, I
Priority: High
Target Audience: Campus Community, IPF Staff Members
Key Message: General watershed and stormwater information; How to spot and report illicit discharges
Delivery Mech.: At least three brief articles will be written for the IPF Intranet site and the Office of Campus Sustainability over the permit cycle that discuss stormwater-related issues, including reporting illicit discharges, benefits of low impact design and how the campus is managing stormwater
Timetable: Three articles prior to the expiration of the permit
Responsibility: Campus Sustainability, IPF communications staff and IWR
Evaluation: Summary of articles and distribution

Activity: Employee Information Dissemination – Staff Training
Corr. Topic Area(s): A, B
Priority: High
Target Audience: RHS and IPF Environmental Stewards
Key Message: General watershed and stormwater updates; How to spot and report illicit discharges
Delivery Mech.: As part of ongoing Environmental Stewards training, provide stormwater information and materials
Timetable: A minimum of three sessions provided over the permit cycle, beginning in 2014
Responsibility: IPF communications staff, RHS Sustainability and IWR
Evaluation: Summary of articles and distribution

(D) Promote preferred cleaning materials and procedures for car, pavement, and power washing.

Activity: Series of posters and brochures covering: car washing, pet waste, motor oil and fertilizer reduction.
Corr. Topic area(s): A, B, F, G
Priority: Medium
Target audience: Public
Key message: The posters and brochures describe the impact that bad practices related to car washing, pet waste disposal, motor oil disposal and fertilizer

application can have on water quality. They also provide alternatives or best management practices for each of the four topics.

- Delivery Mech.** Posters and brochures are available in hard copy for use at various events. They are also posted to the GLRC and MSU-WATER website.
- Timetable:** Continuous use at public events (Adopt A River, Quiet Water Symposium, MWEA Watershed Summit), etc., update as appropriate.
- Responsibility:** GLRC Coordinator, PEP Committee and MSU-IWR
- Evaluation:** Number of brochures provided throughout the year and website statistics

(E) Inform and educate the public on proper application and disposal of pesticides, herbicides, and fertilizers.

See corresponding topic area G below.

(F) Promote proper disposal practices for grass clippings, leaf litter, and animal wastes that may enter into the MS4.

- Activity:** Promote existing materials related to grass clippings and leaf litter.
- Corr. Topic area(s):** A, K
- Priority:** Medium
- Target audience:** Public, small businesses
- Key message:** Use the best management practices for management of grass clippings and leaf litter.
- Delivery Mech.** Website and social media postings, promoted through the GLRC educational display.
- Timetable:** 2013, continuous
- Responsibility:** GLRC Coordinator and MSU-WATER website
- Evaluation:** Number of flyers/brochures handed out and website statistics

- Activity:** Continue to maintain pet waste reduction watershed signage at parks or designated dog areas.
- Corr. Topic area(s):** A, D
- Priority:** Medium
- Target audience:** Public
- Key message:** Promoting pet waste reduction for watershed protection, connecting the public to their surrounding environment.
- Delivery Mech.** Passing vehicles, people biking, walking or running, and pet owners will view the signs.
- Timetable:** The signs will be maintained indefinitely, with the Campus Stormwater Committee reviewing annually.
- Responsibility:** MSU Stormwater Committee and Landscape Services
- Evaluation:** Summary of signs posted and maintenance activities

(G) 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.

Activity: Promote local Household Hazardous Waste Collection and Recycling Events.

Corr. Topic area(s): D, E,

Priority: Medium

Target audience: Public, small businesses

Key message: Pollution prevention by using available resources for appropriate disposal of waste.

Delivery Mech. GLRC website, social media

Timetable: Continuous, updates as necessary and as events are scheduled.

Responsibility: GLRC coordinator. MSU Surplus Store and Recycling Center promotes recycling and community reuse days.

Evaluation: Website statistics

(H) Inform and educate the public on proper septic system care and maintenance, and how to recognize system failure.

Activity: Promote and post local Point of Sale/Time of Sale septic/well inspection ordinances in Eaton and Ingham Counties. Also partner with local 319 groups addressing existing *E.coli* TMDL, post materials developed, explore educational opportunities, etc.

Corr. Topic area(s): A

Priority: Low

Target audience: Public

Key message: Maintain your septic system; it could be contaminating local water bodies through stormwater runoff.

Delivery Mech.: GLRC website, social media

Timetable: Continuous

Responsibility: GLRC coordinator

Evaluation: Website statistics

(I) Educate the public on, and promote the benefits of, green infrastructure and Low Impact Development.

Activity: Promote Low Impact Development (LID) brochure, update as appropriate.

Corr. topic area: A

Priority: High

Target audience: Public, elected officials, small businesses

Key message: Promote the use of LID and green infrastructure (GI) as a tool for reducing polluted runoff from development sites. The brochure explains what LID and GI are and provides examples and resources (links).

Delivery Mech. GLRC website, social media, use with MSU educational display

Timetable: Ongoing

Responsibility: GLRC Coordinator and MSU-IWR

Evaluation: Number of brochures handed out and website traffic linked.

Activity: LID Signage
Corr. topic area: A
Priority: High
Target audience: Students, faculty, staff and visitors to campus
Key message: Signs promote the benefits of GI
Delivery Mech.: Signs will be posted at various LID practices on campus
Timetable: At least two signs posted over the permit cycle
Responsibility: IPF, Surplus Store and Recycling, MSU-IWR
Evaluation: Track inquiries generated by the signs through the Stormwater Committee

Activity: GLRC LID local projects webpage
Corr. topic area: A
Priority: High
Target audience: Public, small businesses
Key message: The webpage promotes local LID and GI projects in the region to help encourage others to pursue projects in their own neighborhood or community. Promotes the MSU-developed Networked Neighborhoods for Eco-Conservation Online (NECO), a LID mapping and sharing system).
Delivery Mech.: GLRC website and social media
Timetable: Continuous, will update as needed, initial revision July 2013.
Responsibility: GLRC Coordinator
Evaluation: Website statistics

Activity: LID Presentation Series
Corr. topic area: A
Priority: High
Target audience: GLRC members, elected officials, public
Key message: Educate participants on several different best management practices (examples include: snow management, LID project highlights, LID monitoring results, pervious pathways and tree preservation techniques, etc.) Several topics are explored based on interest from the GLRC.
Delivery Mech.: Email distribution, GLRC website, social media
Timetable: Complete a minimum of five presentations in the permit cycle.
Responsibility: GLRC Coordinator, Ordinance/BMP Committee
Evaluation: Number of participants attending each presentation.

Activity: Participate in the Greening Mid-Michigan (GMM) Project, a regional green infrastructure (GI) vision video production
Corr. topic area: A
Priority: High
Target audience: Public
Key message: A 27-minute video will be produced with WKAR and will promote GI techniques, demonstrating how they lead to improved land use and water resources management. It will include three to four shorter sound bites specifically related to stormwater management.

Delivery Mech.: GLRC website, social media, video distribution (including schools), WKAR local TV, municipal TV, and MSU-WATER website
Timetable: Video production will be in 2013-2014
Responsibility: GLRC Coordinator and MSU-IWR
Evaluation: Number of video views, website traffic.

(J) Promote methods for managing riparian lands to protect water quality.

Activity: Riparian buffer brochure developed, other resources posted to the GLRC website
Corr. topic area: A
Priority: Medium
Target audience: Riparian landowners
Key message: The brochure provides general information about native riparian buffers and why they are important for water quality and habitat.
Delivery Mech.: GLRC website, social media, use with educational display, MSU-WATER website
Timetable: Ongoing
Responsibility: GLRC Coordinator and MSU-IWR
Evaluation: Number of brochures provided at events, website statistics

Activity: Grow Zone Signage
Corr. topic area: A
Priority: Medium
Target audience: Students, faculty, staff and visitors to campus
Key message: Signs emphasize importance of buffers for protecting waterways
Delivery Mech.: Signs are posted along the campus stretch of the river corridor
Timetable: Ongoing
Responsibility: Landscape Services
Evaluation: Track inquiries generated by the signs through the Stormwater Committee

(K) Identify and educate commercial, industrial, and institutional entities likely to contribute pollutants to stormwater runoff.

Activity: Explore opportunities to connect with local business regarding pollution prevention through stormwater runoff. This may include business publications, presentation to associations and focus groups.
Corr. topic area(s): A
Priority: Medium
Target audience: Businesses, industries, institutions
Key message: Improve stormwater management to reduce pollution.
Delivery Mech.: PEP Committee will determine in 2013-2014
Timetable: GLRC Coordinator will outreach to local businesses twice per permit cycle.
Responsibility: PEP Committee
Evaluation: Number of connections made with local businesses

Activity: Proper Waste Disposal Information Dissemination
Corr. Topic Area: N/A
Target Audience: Faculty, Staff and Students
Key Message: Proper waste disposal
Delivery Mech: The Office of Environmental Health and Safety (formerly ORCBS) at MSU is an independently-reporting administrative support unit created to provide educational and consultative programs and services to the faculty, staff and students of Michigan State University. Through onsite visits and training programs, EHS personnel address proper handling, transportation and disposal of generated hazardous waste; various Chemical, Radiation, Environmental and Biological support training; Laboratory Safety and Inspections; State and Federal regulation compliance requirements
Timetable: Ongoing
Responsibility: EHS
Evaluation: Summary listing of EHS training and educational programs per permit cycle

Chapter 3 - 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). Those Operating Procedures are included in Appendix 5.

Storm Sewer System Map

A current version of MSU's storm sewer system map is located at the MSU IPF - Engineering and Architectural Services (EAS).

Finding and Eliminating Illicit Discharges: Field Identification and Review

As part of the first stormwater permit cycle, the University identified and mapped its outfall locations along the Red Cedar River. The initial discharges to the Waters of the State were identified using existing records. The river corridor was then walked and the listing of discharges was revised to reflect the actual conditions in the field. Details on each discharge point were gathered during the original field investigations, including the size and location of the discharge pipe and other pertinent information. This discharge data is reviewed and updated during reinspections every five years.

As previously noted, a listing of the known MS4 discharges and maps are included in Appendix 4. The maps and specific data on individual discharges will be updated as needed to account for new discharge points as they are constructed or newly identified discharges discovered during the reinspections every five years.

Procedure for Performing Field Observations: Discharge Sampling and Analysis

In addition to periodic site-specific investigations conducted by EHS staff members, reinspections of all MS4 discharge points will be completed once per permit cycle. The inspections are

performed under dry weather conditions. Dry weather flow is defined as flow which occurs a minimum of 48 hours after any precipitation. The inspection program will include the following:

- At a minimum, the dry weather field inspection includes observing each MS4 discharge point for flow and its receiving water's characteristics. The inspection includes water clarity, color and odor; the presence of suds, oil sheens, sewage, floatable materials, bacterial sheens, algae, and slimes; staining of banks and unusual vegetative growth. MS4 discharge structures are also observed for unusual vegetative growth, staining, undocumented connections, and integrity of the structure.
- Preparing a list of any needed maintenance items on the discharge pipe, structure, or receiving water which need to be addressed by the maintenance crews.
- Updating all existing file data to reflect any structural repairs or maintenance performed on the discharge.
- Noting any new discharge points not previously identified. If a new discharge is identified, the source of the discharge will be investigated to ensure that it is a legally permitted discharge. The existing records will then be updated as appropriate and the data on the new discharge (including GPS coordinates) will be submitted to Michigan Department of Environmental Quality (MDEQ).

If flow is observed from any MS4 discharge points, the inspection crew will proceed as follows:

1. If the discharge can be identified as a legal discharge from an obvious source, the discharge will be noted and no further action taken.
2. Where an illicit discharge and its source are obvious, the University will correct it.
3. If the nature or source of a dry weather discharge cannot be readily identified, a sample will be collected and an analysis of the flow shall be conducted to determine if the discharge is illicit. At a minimum, the analysis will include pH, ammonia, surfactants, and temperature.
4. If an illicit discharge is detected and verified through testing and analysis, but the source has not been readily identified, the University will need to identify the source of the illicit discharge. The University will utilize one or more of the following methods to identify the source of the illicit discharge:
 - Indicator parameter sampling
 - Dye testing
 - Video testing
 - Smoke testing
 - Documented visual observations or physical indicators
 - Drainage area investigations

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 (www.msu-water.msu.edu).

Responding to Illicit Discharges and Spills

Spill response procedures require prompt and decisive action and well-trained staff. MSU is committed to providing the required level of manpower, equipment, and materials to ensure timely and effective action to minimize impacts to the environment as a result of a spill or illicit discharge. EHS staff shall work with the IPF staff to determine the source of any known or reported illicit discharge. IPF departments involved include; Plumbing, Roofing, Metal Services and Engineering Services. The objective is to minimize impacts to the Red Cedar River. When MSU becomes aware of an illicit discharge, EHS will dispatch a staff person to address the situation immediately (within the hour). If warranted, sampling will be conducted at that time, with necessary follow-up actions initiated.

Upon discovery of a spill or illicit discharge, trained facility personnel will initiate the following actions:

1. Identify exact source and extent of the released materials with field observation and follow-up source investigation conducted as appropriate.
2. Deploy booms or pads as needed.
3. Notify IPF and MSU Police, as needed.
4. Evacuate all non-essential personnel from the immediate area, if required.
5. Stop processes and operations that may be causing release.
6. Take all steps necessary to minimize and mitigate the spill and contact outside emergency contractor, if necessary.
7. Use booms or dikes around drains.
8. Use inert absorbent materials to clean up the spill. Place booms around outfalls with illicit discharge.
9. Collected spilled material and all cleanup materials will be placed into drums, which are in good condition and properly labeled for proper storage and disposal.

Depending on the type of material spilled, proper protective equipment shall be worn prior to response activities. All spill cleanup debris will be disposed of according to local, state, and federal regulations.

Source investigations will be completed promptly, although the timeline will depend on the complexity of the system. In most situations, response will be completed within seven days. More complicated investigations may require a longer period.

Reporting Any Releases of Polluting Materials

All response agencies required to respond to the spill event will be notified as necessary by EHS staff personnel, including state and federal authorities.

Emergency Contact List

Michigan Department of Environmental Quality, PEAS:	800-292-4706
National Response Center:	800-424-8802
East Lansing Fire Department:	911
MSU Police Department:	911
Ingham County Environmental Health Department:	517-887-4312
Young's Environmental Services	800-496-8647

Authority to Inspect, Investigate, and Monitor

EHS and the IPF are authorized by both the Office of the Vice President for Research and Graduate Studies and the Office of the Vice President for Strategic Infrastructure Planning and Facilities to investigate any illicit discharges and to take appropriate measures to stop and eliminate the illicit discharge. Where an illicit discharge is found, the University will document the steps taken to eliminate the discharge and to assure that the discharge is in fact removed permanently. Where the discharge is due to improper housekeeping practices rather than due to a structural connection periodic inspections of the facility will be performed by EHS.

Documentation of Illicit Discharges

Illicit Spills that occur on University property will be documented with the following information:

1. Date, time, and duration of the release
2. Type of Incident
3. Materials involved
4. Storm drains and outfalls impacted
5. Recovered material;
6. Corrective action taken
7. Prevention measures

In addition, implementation of the IDEP program will be reviewed annually by the MSU Stormwater Committee to discuss effectiveness of existing procedures and make changes as necessary.

IDEP Implementation Responsibility and Training

Staff members from the MSU IPF Division, EHS and Institute of Water Research will be responsible for overseeing the IDEP program, performing the IDEP inspections, and preparing the annual IDEP report. One of these staff members is an active member of the GLRC.

IDEP training will be conducted both internally for MSU staff members and in cooperation with the Greater Lansing Regional Committee (GLRC) for Stormwater Management. The GLRC IDEP

Committee has included training for the IDEP inspectors and people associated with the IDEP program. MSU has participated in those training sessions. Staff members involved with the IDEP inspection process who have not yet been trained will be trained on IDEP protocol once prior to the expiration of the current permit cycle.

In addition, Landscape Services staff members and construction inspection representatives in the MSU IPF will receive training on identifying and reporting illicit discharges. This training has been developed and incorporated as part of the existing online stormwater training program and is tracked through the EHS training database. All staff members who will be performing illicit discharge investigations will be trained once during the permit cycle, with new hires trained within their first year of employment.

IDEP Evaluation

The effectiveness of the IDEP program can be measured by summarizing compliance with the prohibition of illicit discharges into Waters of the State. This will be measured by the number of suspected illicit discharges that are actually confirmed and then removed.

MSU will maintain records of its IDEP screening program and any illicit discharges that are identified. The records will include details of the methods used to eliminate the discharge, and follow up investigations to assure that the discharge has been permanently removed. Summary information regarding each outfall will also be collected as part of the evaluation activities, as shown in the Action Plan Table that follows.

MSU will also track calls from staff members and the public regarding illicit discharges. Currently students, faculty/staff and visitors are advised to call the Office of Environmental Health and Safety (EHS –formerly ORCBS) at (517) 355-0153 with any observed environmental concerns regarding the Red Cedar River. EHS will then investigate the incident. As part of its investigation procedures, EHS maintains contact with the IPF main dispatch line at (517) 353-1760, where operators identify appropriate IPF staff members who can help with IDEP follow-up investigations. EHS is then responsible for reporting incidents to the MDEQ as necessary and tracking information regarding the incident.

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 EHS.

A Red Cedar River Contingency Plan is also in place that would be followed in the event of a release that triggers requirements under the Clean Water Act. Copies of the plan are maintained at EHS, MSU Police and the East Lansing Fire Department with a summary of any corrective measures, if required.

The MSU Stormwater Committee will review the implementation of the IDEP program annually, including a review of training records and response to complaints.

Illicit Discharge Regulatory Mechanism

Standard Operating Procedures that address illicit discharges are in place and enforced by EHS. These are included as Appendix 5. In addition, MSU's Pollution Prevention Incident Plan (PIPP) and its Spill Prevention, Control, and Countermeasure (SPCC) plan are designed to meet the requirements under R323.2190, Part 31 to prevent the release of chemicals, petroleum products or waste products into the waters of the State of Michigan. Good housekeeping, inspections, training and rapid response are measures used to minimize impacts to local waterways.

The IDEP Action Plan, Timeline and Evaluation Methods are included in the table below:

Minimum Measure	BMPs	Begin By	Complete By	Evaluation Methods	Comments
IDEP	Identify illicit discharges and take corrective actions	On-Going	Long Term	No. of illicit discharges identified and database of corrective actions taken.	
IDEP	Update map and listing of all MS4 annually to DEQ if new discharges are added.	Apr-08	Ongoing	No. of new discharges added, mapped & provided to DEQ	
IDEP	GPS all MS4 outlets to Waters of the State and provide latitude and longitude to DEQ for their use.	Apr-08	Long Term	No. of outlets tracked through GPS	
IDEP	Inspect all on-campus discharge points	2013	2014-2017	Summary of each discharge point, including photographs	
IDEP	Staff Training on IDEP inspection procedures	Continued from first permit cycle	Ongoing	List of staff trained on IDEP protocol	
IDEP	Staff Training on identifying and reporting illicit discharges	2010	Ongoing	List of staff trained	

Chapter 4 - 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).

Much of the campus has been developed or urbanized, and soils generally have limited infiltration and percolation capacity. Meeting these stormwater requirements on an individual project basis in the developed part of campus is very difficult since there is inadequate land area to create Low Impact Design (LID) techniques for volume control or to store stormwater for rate control. The MSU Stormwater Committee met with representatives from the Michigan Department of Environmental Quality (MDEQ) throughout the second MS4 permit cycle to pursue an alternative approach to meeting the stormwater requirements. In 2010, the MDEQ approved the University's alternative approach to meeting post-construction stormwater controls. The approval letter is included as Appendix 6.

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 DEQ staff in a series of meetings. A copy of the MSU Stormwater Design Standards is included in Appendix 7.

Under the alternative approach, projects that may alter the stormwater volume or peak-rate characteristics will be 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.

The University is well suited to taking an alternative approach to meeting the permit requirements for several reasons. As a large, single landowner within the Red Cedar River Watershed, MSU has a strong and centralized ability to manage all development projects occurring on its property. A robust Campus Master Plan is in place that emphasizes planning principles that encompass environmental protection. The University is committed to linking central stormwater management planning and modeling to its long-range capital improvement and construction planning process, as well as coordinating stormwater management with its existing plans to enhance campus green space. In addition, as a Land Grant institution, MSU is committed to demonstrating new techniques for managing stormwater and involving faculty members and students in researching the effectiveness of cutting-edge approaches to dealing with stormwater management alternatives.

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. MSU has 52 storm sewer pipes that discharge directly via outlets to the Red Cedar River between Hagadorn Road at the eastern edge of campus and the Kalamazoo Street Bridge at the western edge. 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.

Of the 2,200 acres on the urbanized portion of campus, approximately 1,302 acres are located within four large sub-districts (33, 37, 42 and 53). These areas comprise the south central academic core area and include the most likely locations for future campus development projects according to the 2007 Campus Master Plan. A Stormwater Management Model (SWMM) detailing the hydraulic characteristics of these primary sub-districts was completed to provide an accurate planning tool for future projects considered in these districts. Stormwater improvement scenarios can be quickly evaluated for these districts, allowing MSU to accurately depict conditions and proposed water quality improvements and volume control parameters on a subwatershed basis. The boundaries of the individual watersheds, with the four primary subdistricts listed, are depicted in Appendix 8.

A number of LID techniques have been implemented across the campus over the first two stormwater permit cycles, 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.

With the projects completed between 2007 to 2010, the MSU East Lansing campus had a net reduction of over 16 acres of imperviousness primarily due to the removal and rebuilding of the University Village complex and removal of a section of East Circle Drive. These projects reduced the peak flow to the Red Cedar River by approximately 4.5 cubic feet per second (cfs) for a 1-inch per hour storm event and also reduced associated total suspended solids. These projects along with the LID and structural Best Management Practices (BMPs) mentioned above demonstrate progress toward meeting post construction controls.

As of July 1, 2010, any development project greater than one acre in size that has not yet completed the Schematic Design phase of the planning process is required to meet the MSU Stormwater Design Standards and submit plans for stormwater controls to the MSU Stormwater Committee. All projects that have had impervious changes will be documented in a yearly change log and monitored as part of the permit compliance activities. A runoff coefficient will be used to estimate runoff values for different land uses. When projects that reduce impervious surfaces (such as the demolition of buildings or road and sidewalk removals) are completed, a “credit” is calculated. Table 9 in the Stormwater Design Standards is used as a guideline in determining the weighted runoff value for the proposed condition, which is then compared to the current site condition to establish a credit. For example, when a parking lot area with a c value of 0.90 is changed to a grassy site with a c value of 0.15, the resulting credit would be based on the acreage times the c value reduction – in this case 0.90-0.15 or a .75 reduction. Calculations for the proposed and existing site conditions are reviewed by the Stormwater Committee and tabulated annually in the impervious change summary table (Table 1). The IPF Division is responsible for maintaining the log and ensuring accurate record keeping regarding the post construction controls for each development project. Training of IPF staff members who will be responsible for implementing the Alternative Approach commenced in 2010.

Projects that have already passed the Schematic Design (SD) phase as of July 2010 were grandfathered. Since 2010, more than 15 acres of impervious surface have been removed through various demolition projects, and runoff from nearly 17 acres is now directed to stormwater treatment devices to address water quality requirements. Table 1 summarizes stormwater BMPs by development project for the period 2008-2012.

Table 1. Stormwater Best Management Practices (BMPs) 2008-2012

Year	Building Name	Watershed District	Net Impervious Area Increase (AC)	Runoff Coefficient	Adjusted Impervious Area Increase (AC)	Area Treated for 80% TSS (AC)	Comments
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 Removal	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	0.15	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	0.13		0.13	0.13	Significant LID, including rain garden
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	4.95		4.95	4.95	Significant LID, including porous pavement, detention and rain garden
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

Year	Building Name	Watershed District	Net Impervious Area Increase (AC)	Runoff Coefficient	Adjusted Impervious Area Increase (AC)	Area Treated for 80% TSS (AC)	Comments
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

Total Change Since 1/1/2008

-14.62

116.92

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

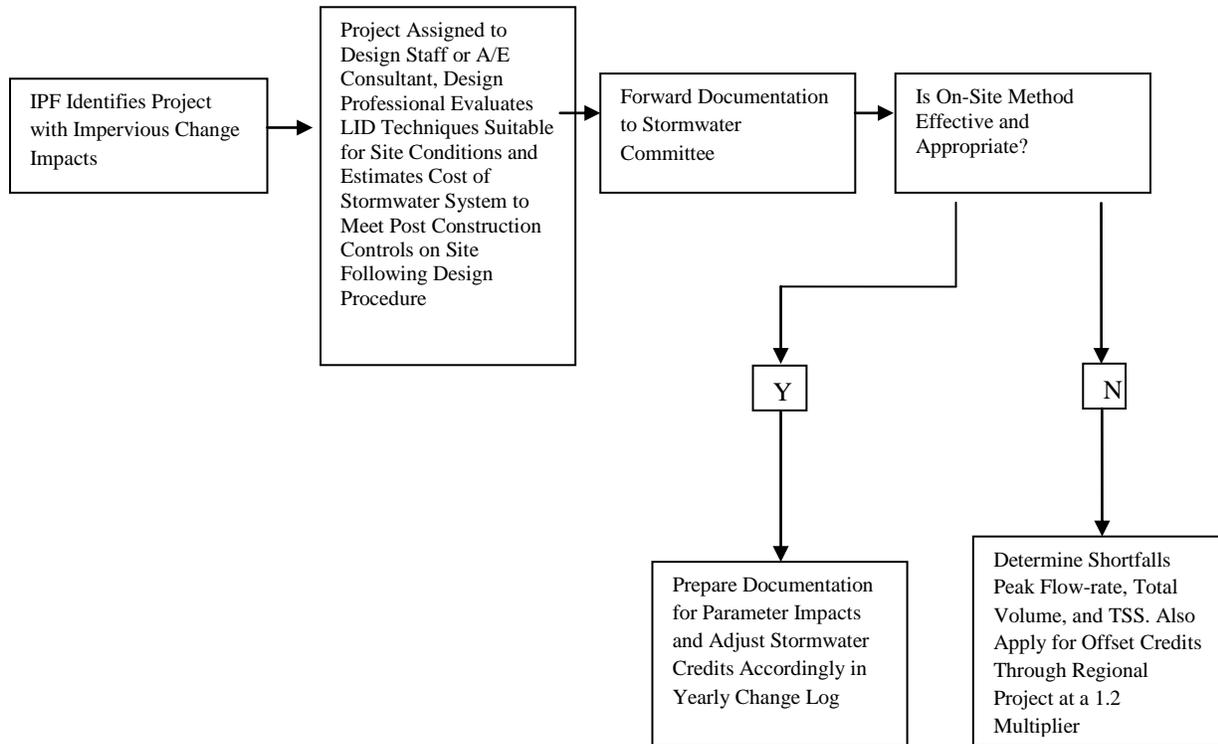
Site Specific Requirements

The Stormwater Committee will be 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 will annually review and assess the effectiveness of this procedure. A regional approach for stormwater infiltration may be required in instances where groundwater contamination exists. The committee is also charged with reviewing the appropriateness of infiltration techniques for land uses with high potential for contamination.

The MSU Stormwater Committee will assess each project on a site by site basis when determining potential locations for offsite stormwater controls. The committee serves as an unbiased entity that seeks to balance stormwater compliance, the campus master plan, aesthetics and costs for all new development projects. The committee first reviews the project for appropriateness of using onsite stormwater controls. If the cost for managing stormwater onsite approaches double that of a typical treatment system, the committee will consider a regional project in the same subwatershed district. If, due to considerations such as available land area, aesthetics or excessive cost, this alternative is deemed inappropriate, the committee will then look at subwatershed districts in the next upstream district(s) for a regional project location.

Site Plan Review

The flow chart below depicts the process that will be used for reviewing and implementing Post Construction Runoff Controls:



All projects that may affect impervious changes to the MSU campus are administered through the MSU IPF Division. For larger projects, the IPF contracts with an Architectural/Engineering (A/E) firm to develop the design and construction documents. All A/E firms must follow the MSU Construction Standards. These standards have been written to require sustainable design and LID techniques and outline the stormwater parameters all new construction projects must meet.

As a project design evolves, the A/E consultant is required to complete a preliminary design review and propose a methodology for dealing with stormwater management for the specific site in accordance with the MSU Stormwater Design Standards. Depending on the location of the project and the density of development for the existing site, there will be a limit to the amount of LID techniques that can be practically implemented. Some sites will be able to meet the post construction control requirements on their own; others may require the alternative approach to compensate for the shortfall. The stormwater control methodology and cost estimate for the project to meet the permit requirements must be submitted for review.

A formal Stormwater Committee oversees compliance with post construction runoff controls. Chaired by the University Engineer and comprised of staff members representing Engineering and Architectural Services, Campus Planning and Administration, Landscape Services, the Land Management Office, Environmental Health and Safety and the Institute of Water Research, the

committee will view the development plan and determine if the project is best suited to meeting stormwater permit requirements onsite, or if a regional project may be used to meet the permit requirements on a partial or entire basis. If a regional project is determined by the committee to be a necessary option, then a capital cost may be assigned to the project for the parameter shortfalls.

When the final decision is made, each element of the stormwater standards will be documented, and the yearly change log will be updated. This yearly log maintenance is an integral part of the alternative approach and is subject to periodic audit by the MDEQ.

Long-Term Operation and Maintenance of Best Management Practices (BMPs) and Record Keeping

Ongoing operation and maintenance of the stormwater BMPs is a critical component of the Stormwater Management Plan. To ensure timely inspection and maintenance of the BMPs, MSU's Stormwater Management Interactive Map has been developed. This is a web-based map of the campus that is integrated with the campus GIS system (MUNSYS), and the preventive maintenance system (FAMIS). When a BMP is added to the system, the attributes are added to the campus GIS system and the BMP is categorized and given an equipment number. A maintenance and inspection checklist is then included in the database along with a required schedule for periodic inspections. IPF Landscape Services is responsible for ongoing inspection and maintenance of stormwater controls. When the inspection is complete the information is entered in FAMIS, which the website then gathers and displays.

The IPF Capital Project Procedures requires the lead designer for IPF EAS to complete a FAMIS budget sheet as the project goes to the construction phase. If a capital project has a stormwater BMP of any kind, the task code (435) is completed to establish the 20-year O&M fee. This is the trigger for the Landscape Services task to enter the BMP in to the MUNSYS data base.

Landscape Services working with EAS then sets up an equipment number and determines the appropriate inspection protocol based on the type of BMP that is being installed. This is done as the project is approved for construction. In most cases the equipment number and the associated graphical updates for the device including the tributary area served are placed in MUNSYS prior to the device being constructed. The survey crew then documents the as-built condition and updates MUNSYS as necessary when the device is placed in the field. The basis of design, construction drawings and design review are filed with the project using the *Meridian* file manager. A map of campus stormwater BMPs is included in Appendix 9.

Chapter 5 - 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 the MDEQ. 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 DEQ 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 Engineering and Architectural Services (EAS) 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, EAS 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

EAS 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 EAS or LMO staff confirm that all necessary SESC devices and techniques are all clearly located and quantifiable.

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

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 DEQ 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 MDEQ.

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.

Chapter 6 - 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.

The Greater Lansing Regional Committee (GLRC) Ordinance Committee developed the “Good Housekeeping and Pollution Prevention for Municipal Activities” manual in September 2007. The manual included specific source control Best Management Practices (BMPs) that could be used by individual GLRC members to address many of the requirements of their permit. Staff members in IPF Landscape Services have used portions of this BMP manual to guide their operations. In addition, operating procedures pertaining to specific requirements in the stormwater permit are included below.

Municipal Facility and Structural Stormwater Control Inventory

MSU’s separate stormwater drainage system consists primarily of separate storm sewer pipes, manholes, inlets, catch basins and bioretention areas, as well as oil-water separators and proprietary devices for treating stormwater runoff. Web-based University utility maps are available which identify catch basins and storm drains. These are maintained by the MSU IPF Division, and serviced by Landscape Services. A listing of stormwater controls is provided as Appendix 10.

Updating and Revising the Inventory

The University’s Capital Project Procedures requires the lead designer for IPF Engineering and Architectural Services (EAS) to complete a budget sheet as the project moves to its construction phase. If a capital project has a stormwater best management practice of any kind, the task code (435) is completed to establish the 20-year operation and maintenance fee. This is the trigger for the Landscape Services staff to enter the BMP into a database. Landscape Services working with EAS then sets up an equipment number and determines the appropriate inspection protocol based on the type of BMP that is being installed. This is done as the project is approved for construction. In most cases the equipment number and the associated graphical updates for the device including the tributary area served are placed in the database prior to the device being constructed. The survey crew then documents the as-built condition and updates the database as necessary when the device is placed in the field. The basis of design, construction drawings and design review are filed with the project using the *Meridian* file manager.

Facility-Specific Stormwater Management

MSU’s Stormwater Committee has reviewed the facilities with the potential to discharge pollutants to surface waters of the state. The committee meets monthly to review campus-wide

stormwater issues. When assessing the pollution potential of a facility, the committee takes into account the following factors:

- Amount of urban pollutants stored at the site (e.g., sediment, nutrients, metals, hydrocarbons, pesticides, fertilizers, herbicides, chlorides, trash, bacteria, or other site-specific pollutants)
- Identification of improperly stored materials
- The potential for polluting activities to be conducted outside (e.g., vehicle washing)
- Proximity to waterbodies
- Housekeeping practices
- Discharge of pollutants of concern to impaired waters

High-Priority Sites

The 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.

A Stormwater Pollution Prevention Plan (SWPPP) has been developed for each of these facilities, and are included as Appendices 11, 12 and 13, respectively.

The goals of those plans include:

- 1) Maximize control of significant polluting materials
- 2) Reduce the potential levels of these materials that could enter stormwater
- 3) Ensure that stormwater discharges from the site will not cause a violation of Michigan's water quality standards.

A copy of each SWPPP is located at the respective facilities. An Industrial Stormwater Operator in the Office of Environmental Health and Safety (EHS) is responsible for monitoring the implementation of the plans.

Procedures for spill prevention and control are documented in the University's Spill Prevention, Control and Countermeasure (SPCC) plans for campus, which are designed to meet federal requirements under 40CFR Part 112 dealing with aboveground oil storage facilities. MSU's Pollution Prevention Incident Plan (PIPP) exists to meet the requirements of Part 5 Rules of the State of Michigan dealing with chemical and petroleum storage.

The Landscape Services facility and the T. B. Simon Power Plant are both piped to the sanitary sewer system and are thus not considered high priority sites for this SWMP.

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 this chapter of the Stormwater Management Program are followed.

Parking lots are swept on a regular basis following the street sweeping rotating schedule. All University-owned vehicles are required to undergo annual inspections to ensure that they are in proper working condition and not leaking potential pollutants. No long-term storage of student vehicles is allowed in University parking lots (lots are regularly monitored by MSU Police for inactive vehicles and vehicles are towed if necessary).

University-owned rolloff bins are visually inspected by MSU Sustainability twice per month throughout the construction season. In addition, rolloffs are inspected when they are returned to the Recycling Center, and Sustainability staff members communicate directly with departments to address any issues with disposal of materials that may pose a risk to water resources.

In addition, MSU’s Construction Standards contain provisions for addressing construction debris control. An excerpt follows:

CONSTRUCTION DEBRIS CONTROL

- A. The Contractor shall provide and administer a system for disposal of construction debris, and shall be responsible for seeing that the site and the new building are at all times free of accumulated debris caused by the construction. For purposes of this paragraph, debris shall include ALL materials used in construction including construction roads and pads. Special attention should be given to materials that could leach into the ground, including but not limited to lime based materials, all chemicals, and any liquids except clean water.*
- B. The Contractor shall comply with LEED Materials & Resources Credit 2, including documentation of the Construction Waste materials recycled, reused and sent to the landfill, using the Construction Waste Management form and process provided by the Owner in Unifier. This form shall be submitted monthly, and will be generated from completed payment applications. Negative reports are required.*
- C. This shall include, but not be limited to, rubbish containers conveniently located throughout the site for the daily disposal of debris directly into them from each work location. Debris shall not be allowed to accumulate on the ground through-out the site overnight.*
- D. All combustible debris shall be removed to a solid waste disposal site properly licensed under Act 87 of the Public Acts of 1965 of the State of Michigan.*
- E. No burning of debris will be permitted on the Project site or elsewhere on the Owner's property.*
- F. Should the Contractor not execute the work required in this section, the Owner reserves the right to perform the work by other forces and deduct the cost from the contract price.*

Pesticides are applied only by certified applicators, and pesticide/fertilizer applications are documented by IPF Landscape Services.

Each Spring and Fall, EHS completes a campus-wide windshield inspection to check parking lots and other areas that may potentially be contributing pollutants to the Red Cedar River. Items of concern are addressed immediately. Those inspections are documented by EHS.

Structural Stormwater Control Operation and Maintenance Activities

The University's inventory of stormwater structural controls includes:

- Catch basins – 2223
- Detention basins – 14 (3.28 acres)
- Oil/water separators – 19
- Pump Stations – 4
- Secondary Containment – Aboveground Storage Tanks:
 - Landscape Services – 2 – double-walled, inside concrete secondary containment
 - Golf Course – 2 – concrete secondary containment
 - MSU Power Plant – 2 - inside concrete secondary containment
- Secondary Containment – Underground Storage Tanks:
 - MSU Fueling station – 3 – double walled with interstitial monitoring
 - TB Simon Power Plant – 1 – double walled with interstitial monitoring

Vegetated swales – 1 (.02 acres)

Constructed Wetlands – 3 (29.16 acres)

Porous pavement – 32 (3.26 acres)

Rain Gardens – 12 (1.29 acres)

Underground Storage Vaults or Tanks - 15

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.

After catch basins are cleaned, the collected material is dumped into a 20-yard rolloff box. A plastic box liner is placed into the box prior to dumping to avoid leaks. Prior to hauling the container to the landfill, the remaining liquids are vacuumed from the rolloff box. These liquids are pumped into a tanker trailer to be hauled to a licensed facility for treatment.

Street sweeping solids are temporarily stored in a 10-yard rolloff box and hauled to landfill.

Landscape Services is responsible for the cleaning of the separate storm sewers and all catch basins and inlets associated with the public infrastructure and structural controls, with the work ultimately completed by a licensed contractor. The work is done as a corrective action when warranted, but is typically completed as a preventative measure. Guidelines exist for cleaning and inspection frequencies, as detailed below.

Catch basins are cleaned on a two-year rotating basis (see catch basin cleaning map in Appendix 14). Debris is measured and recorded prior to disposal. Waste collection and disposal is completed by a licensed contractor. That process is detailed in Appendix 15. As part of the cleaning process, the individual catchbasins are inspected for any structural defects or abnormalities. If any defects are found, the Landscape Services supervisor will communicate with the Maintenance Services supervisor to camera the pipes connecting to the structure to check for breaks which may have caused an increase in sediment.

The contractor responsible for servicing the University's storm drain system has in place established procedures for inspecting and cleaning catch basins and oil water separators on the campus. In addition, maintenance procedures for individual catchbasins are provided in the GLRC Ordinance Committee's manual on "Good Housekeeping and Pollution Prevention for Municipal Activities" which is used as a reference by Landscape Services staff members.

As part of the University's hazardous waste program, procedures are in place to document the proper methods of handling and disposing of known hazardous or toxic materials. Annual training is required for staff members involved with handling and disposing of hazardous waste on the campus. EHS is responsible for management and compliance of regulatory requirements that are outlined in the Part 111 waste storage facility operating license and requirements set forth in CFR 262-264.

The design and maintenance of specific structural stormwater devices is included as part of the MSU Stormwater Design Standards (see Appendix 7) and the State of Michigan Low Impact Development Manual. The IPF Division Engineering and Architectural Services staff members are following these documents as part of the Post Construction Stormwater Runoff controls (see Chapter 4).

All projects that have the potential to disturb more than one acre of the campus are designed through IPF EAS following the capital projects procedures. The Stormwater Design Standards outline the procedure for post construction control requirements for any project that will disturb more than one acre. This design standard is followed by internal design staff (or by an outside consultant working under the direction of EAS) to design appropriate BMPs for all site projects. Where the impervious quantity is not changing, the criteria is limited to stormwater quality BMPs. When the impervious area is being increased, then the water quality and the infiltration criteria outlined in the standard must be met. The design is sent to the Stormwater Committee to review and approve. The committee then documents the design criteria has been appropriately met by providing a written checklist that the design is in accordance with the established standard. The lead designer then files this documentation with the project design file. For larger projects, the Landscape Services maintenance group will also be involved with the design process to have input on future operation and maintenance requirements.

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. The Stormwater

Committee reviews the stormwater controls inspection and maintenance activities at least annually, and provides oversight to ensure the inspection and maintenance tasks are completed. The committee meets monthly to discuss campus-wide stormwater issues. At those meetings, any inspection findings of import or citizen complaints are discussed. Any necessary changes to the inspection and/or cleaning schedule are made within 30 days.

MSU Landscape Services uses the GLRC Ordinance Committee's manual on "Good Housekeeping and Pollution Prevention for Municipal Activities" as a reference manual. Several of the Source Control BMPs contained in the manual address these items. In addition, the following activities are currently being implemented:

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 rolloff bin and hauled to an approved landfill. No street sweepings are composted.

Street sweeping is prioritized in the spring by starting with streets that have a larger amount of debris on them. Staff members then sweep streets and parking areas that are located near commencement activities prior to their completion in early May. From there the remaining roads are completed, beginning with main roads such as Farm Lane and Trowbridge. The next priority is parking lots, beginning with lots that are being line stripe painted that particular year. The goal is to have all streets swept initially by the end of May and this is an ongoing project throughout the spring, summer and fall. Streets and parking lots are constantly monitored to keep them clean and safe. If any issues concerning street cleaning are seen, the campus community is encouraged to contact MSU Dispatch or Landscape Services to report them. One large sweeper and one smaller vacuum work together to efficiently keep the streets and parking lots clean. The University does not dewater waste materials, and all street sweeping waste is hauled to the landfill.

Leaves are blown off the roads and back into the lawn area for composting throughout fall on a weekly basis. Leaves are not blown into the Red Cedar River. All organic matter (e.g., pine needles and leaves – no soil or gravel) is composted, mixed with topsoil, and recycled for use on campus.

All sweeping activities are documented in a log completed by the operators. The MSU Stormwater Committee meets monthly to discuss campus-wide stormwater issues. At those meetings, any inspection findings of import or citizen complaints are discussed. Any necessary changes to the inspection and/or cleaning schedule are made within 30 days.

Construction standards are in place for all major construction projects to ensure that good housekeeping practices are followed, including hazardous materials handling, soil erosion and sedimentation control and construction debris control. Pre- and post- audits are conducted by IPF staff on all projects. Each project is assessed on an individual basis, with appropriate best management practices implemented as necessary. MSU maintains three vehicle bridges and three

pedestrian bridges. Vehicle bridges are periodically cleaned following the same procedure as street cleaning. The pedestrian bridges have a urethane non-slip coating surface applied to them and are periodically recoated.

All significant maintenance projects including periodic concrete restoration, urethane coating and painting are completed with oversight by IPF following the established *Standards for Construction* that include general requirements for dust control and treatment of stormwater during construction.

Cold Weather Operations

Snow and ice removal on the Michigan State University campus is a major priority of MSU Landscape Services. A delicate balance of maintaining safe conditions while reducing the use of deicing products is an ongoing challenge. With the Red Cedar River running through campus, a significant investment in building structures and a beautifully landscaped campus arboretum, deicer usage is not preferred but is a necessary strategy to ensure safety. Landscape Services follows DEQ Salt and Brine Storage guidance materials. In addition, over the past several years, the University has implemented changes in salt application practices to better protect surface water supplies. The University is using the Accubrine brine maker, which lessens salt use for deicing. In addition, a campus snow removal plan (which addresses snow storage) is in place and can be viewed at the following URL: <http://ipf.msu.edu/green/practices/snow-removal.html>

Snow is piled in various locations on campus, which are identified each winter by IPF Landscape Services. Staff members choose locations based on available space, ensuring that piles are not located near the river or in the floodplain, and are located away from existing stormwater BMPs and contaminated sites.

University vehicles are washed in areas serviced by sanitary sewers.

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.

MSU continues to expand areas with tall and intermediate grass within the developed landscape. All ponds and landscape drains are currently surrounded by some type of vegetation. Hard copy campus map currently delineates a buffer zone of irregular width and coverage. Staff members allow for the evolution of natural plant material, supplemented with areas of native wildflowers and prairie grasses where appropriate, and have reduced areas of turfgrass on selected areas of campus property. These no-mow zones include educational signs as part of the University's stormwater Public Education Program.

Employee Training

As part of the first stormwater permit cycle, an online stormwater training program was implemented for various IPF employees. That online program is required for full time employees

in Landscape Services, Planning/Inspectors/Analysts in the IPF Division and Farm Managers whose job positions could impact stormwater. Employees who are tasked with implementing Good Housekeeping requirements will complete the stormwater training program once during the permit cycle. New staff members will be trained within the first year of employment. The online training program is tracked through the EHS website. The stormwater training program is located at the following URL: <http://www.oeos.msu.edu/TRAIN/SWP/>

Contractor Requirements and Oversight

Contractors will receive stormwater-related information during the Contractors and Consultants forum, sponsored by the IPF. Stormwater information will be incorporated into existing required training for all general site contractors. Project representatives are trained to provide oversight to contractors to ensure that stormwater BMPs are followed. The campus Stormwater Committee will review the contractor training materials and assess the efficacy of the training program annually.

The Good Housekeeping Action Plan, Timeline and Evaluation Methods are provided below:

Minimum Measure	BMPS	Begin By	Complete By	Evaluation Methods	Comments
Pollution Prevention and Good Housekeeping	Identify areas along the river corridor as candidates to install riparian buffer preservation (no mow).	Continued from second permit cycle	Ongoing	Map of river corridor with buffer areas delineated	
Pollution Prevention and Good Housekeeping	Install Grow Zone Signs	Continued from second permit cycle	Ongoing	Number of signs installed along the river corridor	
Pollution Prevention and Good Housekeeping	Staff Stormwater Training	2008	Ongoing	No. of staff trained. Freq of training.	
Pollution Prevention and Good Housekeeping	Review existing salt application practices; make changes if necessary		2016	Existing practices reviewed, improvements implemented, number of staff trained	
Pollution Prevention and Good Housekeeping	Sweep/clean University parking lots and streets		Ongoing	Freq of sweeping, amount of material collected	
Pollution Prevention and Good Housekeeping	Clean catch basins on a regular basis and ensure proper disposal of waste materials			Half of catch basins are cleaned each summer	Freq of cleaning and amount of material collected. Waste is handled by a licensed contractor.
Pollution Prevention and Good Housekeeping	Develop stormwater training materials for contractors.		2014		Incorporate stormwater training into existing contractor training program.

Appendix 1 - Greater Lansing Regional Committee (GLRC) Action Plan

Appendix 2 - MSU Stormwater Roles and Responsibilities

Appendix 3 - MSU Regulated Area

Appendix 4 - MSU Discharge Database and Outfall Maps

Appendix 5 - MSU Standard Operating Procedures - Illicit Discharges

Appendix 6 - MDEQ Post Construction Controls Approval Letter

Appendix 7 - MSU Stormwater Design Standards

Appendix 8 - Campus Watershed Districts

Appendix 9 - Campus Stormwater Best Management Practices (BMPs) Map

Appendix 10 - Campus Stormwater Controls Database

Appendix 11 - Stormwater Pollution Prevention Plan – Transportation Services

This document is available at MSU Environmental Health and Safety

**Appendix 12 - Stormwater Pollution Prevention Plan –
Surplus Store and Recycling**

This document is available at MSU Environmental Health and Safety

**Appendix 13 - Stormwater Pollution Prevention Plan -
Forest Akers Golf Course Maintenance Facility**

This document is available at MSU Environmental Health and Safety

Appendix 14 - Catch Basin Cleaning Schedule

Appendix 15 - Catch Basin and Storm Separator Cleaning Procedures