

# City of Ferrysburg

## Stormwater Management Plan

A Regional Collaboration of the Regulated MS4 Communities in the Lower Grand River Watershed

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## **I. Introduction**

This stormwater management plan (SWMP) was developed by the Grand Valley Metropolitan Council's (GVMC) Department of Environmental Programs in cooperation with the regulated communities within the Lower Grand River Watershed (LGRW). Its primary purpose is to identify the practices and procedures to be implemented by the **Community** hereafter referred to as the "Community", to reduce the discharge of pollutants from the Municipal Separate Storm Sewer System (MS4) to the maximum extent practicable (MEP).

An MS4 is defined under the Code of Federal Regulations (CFR), 112.26 as "a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, manmade channels, or storm drains) owned and operated by a state, city, town, borough, county, parish, district, association, or other public body". MS4s include both open and enclosed drainage systems that discharge to waters of the state or to another regulated MS4. Communities are subject to a National Pollutant Discharge Elimination System (NPDES) MS4 permit if a portion of their jurisdictional boundaries are located within the urbanized area. A map of the urbanized area as defined by the 2010 US census is attached as Figure 1. The urbanized area within the community's jurisdiction is the only area to which the policies and procedures identified in this SWMP apply. The SWMP and the documents referenced within it were prepared as part of the NPDES Permit Application for Discharge of Stormwater to Surface Water of the State from an MS4. The Community was notified of the requirement to apply in the letter attached in Appendix 1. This SWMP will address the six minimum measures identified under the Environmental Protection Agency's (EPA) NPDES Permit Program. They are as follows:

- Development and implementation of a public participation/involvement program (PPP)
- Development and implementation of a Public Education Program (PEP)
- Development and implementation of an Illicit Discharge Elimination Program (IDEP)
- Development and implementation of a construction stormwater runoff program
- Development and implementation of a post-construction stormwater runoff program
- Development and implementation of a pollution prevention and good housekeeping program

### **Collaborative Efforts**

As part of this SWMP, the communities of the Lower Grand River Watershed (LGRW) will continue to work collaboratively as watershed and regional partners to implement the Public Education Plan (PEP) and Illicit Discharge Elimination Plan (IDEP) as approved by the Michigan Department of Environmental Quality (MDEQ) in February 2013 and August 2013 respectively. In addition, the MS4 permitted

communities are working collaboratively to implement the six minimum measures as applicable, including shared operational and structural Best Management Practices (BMPs) procedures, good housekeeping procedures, training programs, and a Total Maximum Daily Load (TMDL) monitoring plan. Additional details regarding the collaboration of the permitted communities are detailed in the relevant plans and are included in this SWMP submittal.

## **Review and Updates**

The SWMP will be reviewed according to the measures of effectiveness in the BMP implementation tables for each section as part of the progress report submittal. Any updates or changes will be included with progress report submittals and will be posted in compliance with the Public Participation/Involvement Program detailed in Section III of the SWMP.

## **II. Enforcement Response Procedure (ERP)**

The Community will address violations of ordinances and/or regulatory mechanisms identified in the stormwater management plan and respond to unauthorized discharges to groundwater or waters of the state in such a way as to compel compliance by using the following enforcement response procedures. These procedures include, if necessary, fines, citations, stop work orders, or other tools as identified in the relevant ordinances.

When a staff member identifies or receives a report of a violation that may impact water quality, the report will be forwarded to the Stormwater Program Manager or a designated member of the staff for investigation and follow-up.

The Stormwater Program Manager or a staff member will conduct a site visit and, if an ordinance violation is observed, will notify the owner or person responsible for the violation of the relevant code or regulatory mechanism violated and inform the owner of any cleanup or other action required. A deadline will be provided if necessary. The Enforcement Response Tracking Form will be used to document the nature of the violation and track cleanup, enforcement, and necessary reporting requirements.

A completed copy of the Enforcement Response Tracking Form will be retained to track each incident and its resolution, including reporting discharges to groundwater or surface waters of the state to the MDEQ as required by the NPDES permit and Part 5 Rules. During business hours, DEQ District office will be contacted or after working hours/ on weekends MDEQ's 24-hour pollution Emergency Alerting System (PEAS) at 1-800-292-4706 will be contacted.

If the violation extends beyond the jurisdiction of the community, the Stormwater Program Manager will contact the affected jurisdiction and maintain contact until the violation is resolved. Additional details regarding the enforcement and elimination of illicit discharges is addressed in the current approved IDEP, which is attached in Appendix 4.

## **Enforcement Response Tracking Form**

Event Date: \_\_/\_\_/\_\_\_\_ Time: \_\_:\_\_ AM/PM

Description of Event:

☐ Observed ☐ Reported

Location:

(Provide address, nearest cross street or detailed location)

Quantity of material: \_\_\_\_\_

Material Type: \_\_\_\_\_

☐ Attached MSDS Sheet (if applicable)

Staff Member responding to event:

Party responsible for event:

Name: \_\_\_\_\_

Address: \_\_\_\_\_

Phone: \_\_\_\_\_

Email: \_\_\_\_\_

Ordinance, code or regulatory mechanism  
violated: \_\_\_\_\_

Repeat occurrence? ☐ Yes ☐ No

Was any material discharged to a:

Catch Basin	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Storm Sewer	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Drainage Ditch	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Stream/River/ Lake/Wetland	Yes <input type="checkbox"/>	No <input type="checkbox"/>

If Yes to **ANY** discharge listed above notify  
Stormwater Program Contact Immediately:

☐ Primary Contact:

Name: \_\_\_\_\_

Number: \_\_\_\_\_

☐ Backup Contact:

Name: \_\_\_\_\_

Number: \_\_\_\_\_

Reported Date: \_\_/\_\_/\_\_\_\_ Time: \_\_:\_\_ AM/PM  
Person providing notification:

### **Illicit Discharge Reporting & Enforcement Activity**

MDEQ Notified: Date: \_\_/\_\_/\_\_\_\_ Time: \_\_:\_\_ AM/PM

Clean up began: Date: \_\_/\_\_/\_\_\_\_ Time: \_\_:\_\_ AM/PM

Clean up completed: Date: \_\_/\_\_/\_\_\_\_ Time: \_\_:\_\_ AM/PM

Clean up action taken:

☐ Photos Attached ☐ Maps Attached ☐ Additional Info Attached

Enforcement action taken:

☐ Compliance schedule given: \_\_\_\_\_

☐ Violation Resolved (notes): \_\_\_\_\_

### **III. Public Participation/Involvement Program (PPP)**

#### **Collaboration**

The SWMP was prepared as a cooperative effort by the MS4 permitted members of the LGRW and the Department of Environmental Programs at the GVMC. Revisions to the SWMP will be addressed as a cooperative effort in applicable areas. GVMC will also assist communities with the public participation and public involvement requirements as detailed below.

#### **Public Inspection and Comment**

The Community SWMP will be posted to [www.lgrow.org](http://www.lgrow.org) with an email point of contact for the stormwater program manager or a designated member of the staff. This will be completed within six months of permit issuance. The community, in cooperation with GVMC, will track and detail any comments received as well as any responses given to those comments.

#### **Periodic Review**

The Community will review the SWMP every two years as part of the biennial report. If revised, the SWMP will be re-posted to [www.lgrow.org](http://www.lgrow.org) using the point of contact noted above. The community, in cooperation with GVMC, will track and detail any comments received as well as any responses given to those comments.



## IV. Public Education Program (PEP)

The updated PEP was approved by MDEQ in February 2013. As a MS4 permitted member of this group, the Community intends to continue participating in regional collaboration on the Public Education Program for the upcoming NPDES MS4 permit cycle. The approved Public Education Plan is attached in Appendix 2. The topics within the PEP have been prioritized.

### Collaboration

The Lower Grand River Watershed formed a Stormwater Education Committee in 1999 to begin development and implementation of the PEP. The purpose of the PEP is to promote, publicize, and facilitate education for the purpose of encouraging the public to reduce the discharge of pollutants in stormwater to the maximum extent practicable. Since that time, the committee has met on a regular basis to plan and implement activities identified in the PEP. In January of 2014, the Public Awareness and Marketing Committee of the Lower Grand River Organization of Watersheds (LGROW) and the MS4 Public Education Plan Committee merged to form one group. Since the goals of LGROW, the Lower Grand River Watershed Management Plan and the MS4 Public Education Plan align closely, this will serve to increase both the efficiency and effectiveness of both group's goals by combining their efforts. The current Public Engagement Committee members are listed in the table below.

<b>Table 1. Public Engagement Committee Membership</b>	
<b>Community</b>	<b>Representative</b>
Cascade Charter Township	Steve Peterson
Jenison Public Schools	Christine Marcy
City of Grand Haven	Cheryl Davidson
City of Grand Rapids	Carrie Rivette
City of Grand Rapids	Mike Staal (Committee Chair)
City of Grandville	Jay Kwiatkowski
City of Hudsonville	Jill Frielink
Kent County Drain Commissioner and Administration	Lani Brown
Kent County Road Commission	Bruce Schutte
Kent County Resource Recovery	Megan Kretz

<b>Table 1. Public Engagement Committee Membership</b>	
<b>Community</b>	<b>Representative</b>
City of Kentwood	Jim Beke
MDEQ	Michelle Storey
MDEQ	Dana Strouse
Ottawa County Water Resources Commissioner and Administration	Angela Walachovic
Plainfield Township	Mary Trapp-Gunst
City of Rockford	Mike Bouwkamp
Village of Spring Lake	Chris Burns
Trout Unlimited	Nichol DeMol
Ottawa Conservation District	Ben Jordan
Kent County Conservation District	Connie Redding
City of Walker	Rachell Nagorsen
City of Wyoming	Aaron Vis
GVMC	Wendy Ogilvie
GVMC	Eileen Boekestein
GVMC	Rachel Frantz
GVMC	Cara Decker

## V. Illicit Discharge Elimination Program (IDEP)

This Illicit Discharge Elimination Plan (IDEP) was prepared in accordance with the requirements of the General Permit Application for Storm Water Discharges from MS4s subject to watershed plan requirements. It was approved in August of 2013. The IDEP is intended to prohibit and effectively eliminate illicit discharges to the MS4.

### Collaboration

The IDEP is being implemented under a cooperative program administered by the GVMC and involving the county agencies and municipal units. The IDEP was developed with the support of the LGROW Technical Committee. This committee collaboratively developed the approach and facilitated its implementation including outfall testing, which was conducted in 2013 and 2014, and again in 2017 and 2018 throughout the watershed. Members of the Technical Committee are identified below.

<b>Table 2. Technical Committee Membership</b>	
<b>Community</b>	<b>Representative</b>
City of East Grand Rapids	Doug LaFave
City of Ferrysburg	Karl Rowland
City of Grand Rapids	Mike Lunn
City of Grand Rapids	Dan Taber
City of Grandville	Todd Wibright
Kent County Drain Commissioner and Administration	Angie Latvaitis
City of Kentwood	Jim Beke
City of Kentwood	Kelsey Sloan
MDEQ*	Amanda St. Amour
City of Walker	Rachell Nagorsen
City of Wyoming	Aaron Vis (Committee Chair)
GVMC	Wendy Ogilvie
GVMC	Cara Decker
GVMC	Rachel Frantz
GVMC	Eileen Boeckstein

\*Non-MS4

Although the watershed permit program has been discontinued, the MS4 permitted communities of the Lower Grand River Watershed continue to work together to implement the IDEP and eliminate illicit discharges, as they are identified. This includes an inter-agency agreement to eliminate illicit discharges that cross individual MS4 boundaries.

## **Illicit Discharge Training and Evaluation**

Implementation of the IDEP is ongoing. Staff members responsible for conducting outfall screening or for responding to reported discharges will receive training in field observation, field screening, and source investigation techniques. Training will be conducted prior to any outfall testing for this permit cycle. Field staff will also receive training in procedures for identifying and reporting illicit discharges. This training will be offered at least once during the permit cycle and within one year of hire for new staff. Staff members responsible for enforcement and elimination of illicit discharges and connections will utilize the Enforcement Response Procedure and the applicable regulatory mechanism as identified in Appendix 3.

## **Illicit Discharge Regulatory Mechanism**

A list of all regulatory mechanisms for the communities participating in the shared IDEP program is provided in the table below. The community specific regulatory mechanism for enforcing the IDEP is attached in Appendix 3. Each ordinance or other regulatory mechanism:

- Regulates the contribution of pollutants to the MS4, owned or operated by the permittee.
- Prohibits illicit discharges, including the direct dumping or disposal of materials, into the MS4, owned or operated by the permittee.
- Establishes the authority to investigate, inspect, and monitor suspected illicit discharges into the MS4, owned or operated by the permittee.
- Requires elimination of illicit discharges and connections into the MS4, owned or operated by the permittee.

<b>Table 3. Illicit Discharge and Connection Ordinances and Regulatory Mechanisms</b>		
<b>Community</b>	<b>Illicit Discharge and Connection Ordinance or Regulatory Mechanism</b>	<b>Adoption Date</b>
Cascade Charter Township	<a href="#"><u>Ordinance 7 of 2002</u></a>	June 23, 2004
City of East Grand Rapids	<a href="#"><u>Title II Chapter 28</u></a>	September 19, 2005
City of Ferrysburg	<a href="#"><u>Chapter 157</u></a>	September 7, 2004

<b>Table 3. Illicit Discharge and Connection Ordinances and Regulatory Mechanisms</b>		
<b>Community</b>	<b>Illicit Discharge and Connection Ordinance or Regulatory Mechanism</b>	<b>Adoption Date</b>
Forest Hills Public Schools	Regulatory Mechanism	March 3, 2015
Village of Fruitport	<a href="#"><u>Ordinance No. 100</u></a>	February 16, 2016
Georgetown Charter Township	<a href="#"><u>Chapter 48</u></a>	August 12, 2002
City of Grand Haven	<a href="#"><u>Chapter 37, Article VII</u></a>	February 5, 2007
Grand Rapids Charter Township	<a href="#"><u>Ordinance No. 426</u></a>	January 6, 2004
City of Grand Rapids	<a href="#"><u>Chapter 32</u></a>	July 2001
Grand Valley State University	Regulatory Mechanism	Regulatory mechanism in place after permit issuance
City of Grandville	<a href="#"><u>Chapter 26, Article IV</u></a>	September 26, 2005
City of Hudsonville	<a href="#"><u>Chapter 23, Article IV</u></a>	December 14, 2004
Kent County Drain Commissioner and Administration	<a href="#"><u>Michigan Drain Code Section 280.423</u></a>	Regulatory mechanism in place
Kent County Road Commission	Regulatory Mechanism	Regulatory mechanism in place
City of Kentwood	<a href="#"><u>Chapter 78, Article 3</u></a>	October 24, 2004
Plainfield Charter Township	<a href="#"><u>Chapter 28, Article VI</u></a>	November 6, 2000
City of Rockford	<a href="#"><u>Chapter 5, Section 5.5</u></a>	August 8, 2005
Village of Sparta	<a href="#"><u>Chapter 74, Article VI</u></a>	September 13, 2004
Village of Spring Lake	<a href="#"><u>Chapter 78, Article V</u></a>	January 16, 2006
City of Walker	<a href="#"><u>Chapter 67</u></a>	March 28, 2003
City of Wyoming	<a href="#"><u>Chapter 86, Article V</u></a>	October 3, 2005

Illegal dumping and accidental discharges to groundwater or surface waters of the state will be responded to under the regulatory authority of the ordinance or regulatory mechanism listed above. In the event of a part 201 permitted groundwater discharge, the community will contact MDEQ to ensure the discharger obtains their own NPDES permit to regulate any contaminated groundwater discharge to

the MS4. All discharges will be reported to the MDEQ, per the Enforcement Response Procedure, unless a determination is made that the release is not in excess of the threshold reporting quantities in the [Part 5 Rules](#).



## VI. Construction Stormwater Runoff Control Program

### Qualifying Local Soil Erosion and Sedimentation Control (SESC) Programs

The MDEQ has determined that Part 91 of the Michigan Act and Michigan's Permit by Rule (Rule 323.2190) programs are "qualifying local programs" for the control of wet weather discharges from construction activities that result in a land disturbance of greater than or equal to one acre, or disturb less than one acre that is part of a larger common plan of development or sale. A "qualifying local program" provides control for soil erosion, offsite sedimentation, and other construction-related wastes, consistent with federal stormwater control requirements for MS4 permittees. SESC is regulated by the approved "qualifying local programs" listed in the table below.

<b>Table 4. Part 91 Administration Authority as of July 1, 2018</b>							
<b>Community</b>	<b>Part 91 Contact Info</b>		<b>MEA</b>	<b>Utilizes Kent CEA</b>	<b>Utilizes Ottawa CEA</b>	<b>Utilizes Muskegon CEA</b>	<b>APA</b>
	<b>Name</b>	<b>Phone</b>					
Cascade Charter Township	KCRC	616-242-6914		X			
City of East Grand Rapids	KCRC	616-242-6914		X			
City of Ferrysburg	OCWRC	616-994-4530			X		
Forest Hills Public Schools	KCRC	616-242-6914		X			
Village of Fruitport	MCDPW	231-724-6411				X	
Georgetown Charter Township	OCWRC	616-994-4530			X		
City of Grand Haven	OCWRC	616-994-4530			X		
Grand Rapids Charter Township	KCRC	616-242-6914		X			
City of Grand Rapids	Environmental Services Dept.	616-456-3057	X				X
City of Grandville	KCRC	616-242-6914		X			
Grand Valley State University	Facilities Services	Allendale 616-331-3000 Grand Rapids 616-331-6700					X

**Table 4. Part 91 Administration Authority as of July 1, 2018**

Community	Part 91 Contact Info		MEA	Utilizes Kent CEA	Utilizes Ottawa CEA	Utilizes Muskegon CEA	APA
	Name	Phone					
City of Hudsonville	OCWRC	616-994-4530			X		
Kent County Drain Commissioner and Administration	Deputy Drain Commissioner	616-336-3688					X
Kent County DPW	Kent Co. DPW	616-336-3694					X
<b>*Kent County Road Commission (Kent County CEA)</b>	KCRC	616-242-6914		X			X
City of Kentwood	Engineering Dept.	616-554-0737	X				X
<b>*Ottawa County Water Resources Commissioner &amp; Administration (Ottawa County CEA)</b>	OCWRC	616-994-4530			X		X
Ottawa County Road Commission	Engineering Dept.	616-842-5400					X
Plainfield Charter Township	KCRC	616-242-6914		X			
City of Rockford	Public Services Dept.	616-866-9631	X				
Village of Sparta	KCRC	616-242-6914		X			
Village of Spring Lake	OCWRC	616-994-4530			X		
City of Walker	Engineering Dept.	616-453-6311	X				
City of Wyoming	KCRC	616-242-6914		X			
MDOT	Grand Region	616-451-3091					X

## **Construction Stormwater Runoff Control**

### **Part 91 Agency Notification**

#### **Internal**

The designated point of contact for the Community's CEA/MEA/APA is listed in the table above. Community employees will contact this department or person within two business days if an offsite sediment discharge is observed. Copies of any subsequent inspections or notices of violations will be retained by the enforcing agency for tracking purposes.

#### **External**

The designated enforcing agent for Part 91 within the Community is identified in the table above. The Community will contact the designated agency within two business days if an offsite sediment discharge is observed. Copies of any subsequent inspections or notices of violations will be retained by the enforcing agency for tracking purposes.

### **MDEQ Notification**

In the event of a sediment discharge on a site that meets one or more of the criteria listed below, the community will also notify the MDEQ Part 91 District Administrator. Copies of any subsequent inspections or notices of violations will be retained for tracking purposes.

- The site exceeds five acres in size, thereby requiring a notice of coverage
- The discharge has entered waters of the state
- The discharge is excessive or repetitive

### **Site Plan Review Requirement**

Site plan review will include an inquiry regarding the total disturbed area of the site. Sites disturbing one acre or more will be referred to the permitting MEA or CEA as designated above. Sites exceeding five acres will also be referred to the MDEQ to apply for a notice of coverage.

### **Property Owner Notification**

Part 91 requires that a soil erosion permit be issued by the authorized Part 91 agency for all projects that are one acre or greater. Part 91 also requires that the permit application include property owner information. A copy of the issued permit will be provided to the property owner at the time of issuance.

## VII. Post-Construction Stormwater Runoff Program

### Collaboration

The Stormwater Ordinance (SWOrd) Committee has met monthly to work on crafting a model ordinance (and/or regulatory mechanism) for post-construction controls under the NPDES MS4 individual permits. Members of the SWOrd Committee are listed below:

<b>Table 5. Stormwater Ordinance (SWOrd) Committee Membership</b>	
<b>Community</b>	<b>Representative</b>
Kent County Drain Commissioner and Administration	Brad Boomstra
City of Grand Rapids	Carrie Rivette
Ottawa County Water Resources Commissioner and Administration	Dennis Cole
City of Kentwood	Jim Beke
City of Kentwood	Dan VanderHeide
City of Grandville	Ken Krombeen
Plainfield Charter Township	Rick Solle
City of Walker	Scott Conners
City of Walker	Rachell Nagorsen
City of Wyoming	Myron Erickson
City of Wyoming	Aaron Vis
GVMC	Cara Decker
GVMC	Wendy Ogilvie

### Alternative Approach

The work of the SWOrd Committee has resulted in the development of a comprehensive alternative approach which is included in Appendix 5. This alternative approach identifies the proposed procedures and regulatory requirements for post-construction controls related to:

- Regulated areas

- Channel protection standards
- Barriers to infiltration including hot spots, soil contamination and groundwater contamination
- Mitigation and Payment-in-Lieu
- Proposed timeline for implementation

The alternative approach includes a model flow chart to be used by developers to guide them through the process for submitting a site plan that meets the regulatory requirements. Finally, the alternative approach includes supporting documentation in the form of model site designs. Each site design demonstrates how the proposed alternative prevents or minimizes water quality impacts in comparison with the requirements set forth in the permit application and the current standards.

### **Site Plan Review**

All projects subject to stormwater post-construction controls will undergo a site plan review and approval process. This process will utilize the above mentioned flow chart in tandem with an LGROW Design Spreadsheet. This tool will provide a consistent and objective mechanism by which developers can assess the ability of their selected BMPs and overall site designs to meet the channel protection and water quality standards. Atlas 14 will be the rainfall data source for the water quality treatment standard.

### **Long-Term Operation and Maintenance of BMPs**

For development subject to the post-construction control regulatory mechanism, the regulating MS4 will require the long-term operation and maintenance of BMPs through the completion of a maintenance agreement and inspections. Inspection and any needed maintenance, by the owner, of all structural and vegetative BMPs are required at an interval specified in the maintenance agreement. Inspections and any maintenance of the BMPs will be tracked by the regulating MS4 using the Post-Construction Control BMP Inspection Form or an approved equal supplied and completed by the property owner. Tracking will be tied to the property address or parcel number.

In the event that the owner is not maintaining the BMPs, the agreement gives the regulating MS4 the authority to complete these actions at the property owner's cost or pursue other enforcement actions as specified in the ordinance. The maintenance agreements will be recorded with the register of deeds to ensure that the maintenance responsibilities are transferred with property ownership.

### **Offsite Mitigation and Payment-in-Lieu**

Inspections and any maintenance of the BMPs on Mitigation and Payment-in-Lieu sites will be tracked by the regulating MS4 using the Post-Construction Control BMP Inspection Form or an approved equal

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supplied and completed by the property owner. Tracking of projects will be tied to the property address or parcel number.



## **Post-Construction Control BMP Inspection Form**

Property Address/ PPN: \_\_\_\_\_

Maintenance Agreement No.: \_\_\_\_\_

Original Permitted Site (Mitigation and Payment-in-Lieu only):  
\_\_\_\_\_

**Check all that apply:**

☐ **Long-Term Operation & Maintenance**

☐ **Mitigation Site**

☐ **Payment-in-Lieu Site**

**Inventory of installed BMPs**

**As identified in maintenance agreement:**

BMP No. 1 \_\_\_\_\_

BMP No. 2 \_\_\_\_\_

BMP No. 1: \_\_\_\_\_

Inspector: \_\_\_\_\_

Date of Inspection: \_\_/\_\_/\_\_

Last Inspection: \_\_/\_\_/\_\_

Last Maintenance: \_\_/\_\_/\_\_ or N/A ☐

Functioning properly? Yes ☐ No ☐

Draining Properly? Yes ☐ No ☐

Sediment accumulating? Yes ☐ No ☐

Vegetation accumulating? Yes ☐ No ☐

Erosion or instability? Yes ☐ No ☐

Trash or debris? Yes ☐ No ☐

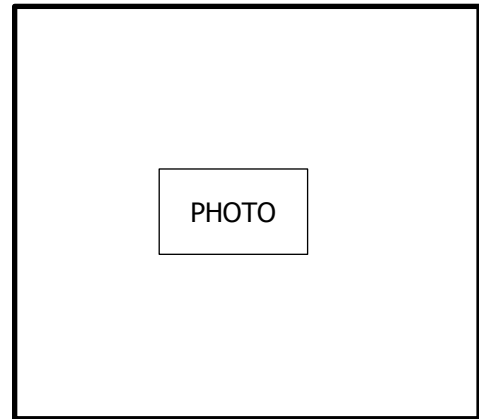
Pollution (oils, etc.)? Yes ☐ No ☐

Other? (see comments) Yes ☐ No ☐

Maintenance required? Yes ☐ No ☐

Scheduled on: \_\_/\_\_/\_\_ or N/A ☐

If yes, describe: \_\_\_\_\_



Completed on: \_\_/\_\_/\_\_ or N/A ☐

BMP No. 2: \_\_\_\_\_

Inspector: \_\_\_\_\_

Date of Inspection: \_\_/\_\_/\_\_

Last Inspection: \_\_/\_\_/\_\_

Last Maintenance: \_\_/\_\_/\_\_ or N/A ☐

Functioning properly? Yes ☐ No ☐

Draining Properly? Yes ☐ No ☐

Sediment accumulating? Yes ☐ No ☐

Vegetation accumulating? Yes ☐ No ☐

Erosion or instability? Yes ☐ No ☐

Trash or debris? Yes ☐ No ☐

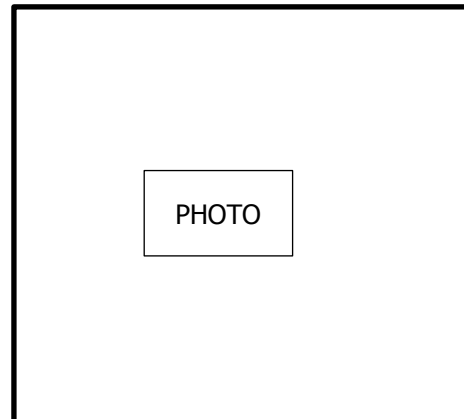
Pollution (oils, etc.)? Yes ☐ No ☐

Other? (see comments) Yes ☐ No ☐

Maintenance required? Yes ☐ No ☐

Scheduled on: \_\_/\_\_/\_\_ or N/A ☐

If yes, describe: \_\_\_\_\_



Completed on: \_\_/\_\_/\_\_ or N/A ☐

## **VIII. Pollution Prevention and Good Housekeeping Program**

Municipal operations cover a wide variety of activities and land uses that are potential sources of stormwater pollutants. These include 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.

All regulated MS4 communities in the LGRW have developed and are implementing activities to ensure compliance with stormwater control, inspection and maintenance requirements, with the ultimate goal of minimizing pollutant runoff to the maximum extent practicable from municipal operations. Specific stormwater controls with inspection and maintenance procedures for each community are provided in the BMP Manual titled, 'Good Housekeeping and Pollution Prevention BMP Operation and Maintenance Manual for Stormwater Controls' (Appendix 7).

### **Municipal Facility and Structural Stormwater Control Inventory**

The Municipal Facility Inventory (Appendix 6) identifies each individual site on which stormwater structural controls with a discharge to waters of the state are implemented based on the categories provided. Facility maps have been created for each site as a part of these inventories and the location of these maps is noted in the inventory provided. The Municipal Facility Inventories and their maps will be reviewed for accuracy every two years and updates will be submitted with the progress reports to MDEQ. New facilities will be reviewed for structural controls and the inventory will be updated within 30 days. The Municipal Facility Inventory also provides an estimate of the total number of structural stormwater controls throughout the entire MS4.

### **Facility-Specific Stormwater Management**

Each facility identified was assessed for the potential to discharge pollutants to surface waters of the state by identifying which, if any, of the following factors or conditions were present on the site:

- Large 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
- Poor housekeeping practices
- Discharge of pollutants of concern to impaired waters

Each facility included in the Municipal Facility Inventory was given a classification of high if it was identified as a fleet maintenance or storage yard or if it met any other two of the above listed criteria. Facilities that met one of the above criteria were given a classification of medium. Facilities that did not meet any of these criteria or which have obtained a certificate of no exposure were given a classification of low. The prioritized facility list is included in Appendix 6.

Facilities identified with a high potential for pollutant runoff have developed a standard operating procedure (SOP) which includes a list of significant materials stored onsite. These materials are prioritized by their potential to pollute stormwater. The SOP also identifies how these materials are handled and stored, and inspection intervals for the facility. These include two types of inspections:

- Routine maintenance inspections of stormwater management and control devices to ensure materials and equipment are clean and orderly and to prevent or reduce pollutant runoff
- Comprehensive inspection of all structural stormwater controls and a review of non-structural stormwater controls to prevent or reduce pollutant runoff

Stormwater structural controls, good housekeeping practices, municipal operations, and maintenance implemented on all priority level facilities are identified in the Municipal Facility Inventory. The specific procedures are identified in the BMP Manual in Appendix 7.

## **Structural Stormwater Control Operation and Maintenance Activities**

Catch basins are prioritized for routine inspection, maintenance, and cleaning based on preventing or reducing pollutant runoff. Areas are assigned a priority of high, medium, or low based on the effectiveness of inspection maintenance intervals during the previous permitting period. The SWPPI and the evaluation in the biannual progress reports provided extensive baseline data to evaluate the relative needs of areas throughout the regulated MS4. Prioritization is based on this data. The prioritized inventory will be reviewed for accuracy and effectiveness every 2 years as part of the progress report. New catch basins will be added to the applicable priority ranking within 30 days of construction.

The list of prioritized catch basins, their locations, and inspection and maintenance intervals are described in the BMP table in Section X of the SWMP. Procedures for the inspection, cleaning, and maintenance of catch basins and the procedures for dewatering storage and disposal of materials extracted are provided in the BMP Manual in Appendix 7.

All structural controls identified in the Municipal Facility Inventory have assigned inspection and maintenance intervals in the BMP table in Section X of the SWMP. Procedures for inspection and maintenance are identified in the BMP Manual in Appendix 7. All new structural controls for water quantity will be designed and implemented in accordance with the performance standards in the

approved post-construction control regulatory mechanism once it is in place. Long-term operation and maintenance procedures will be implemented in the same manner as for private development.

## **Municipal Operation and Maintenance Activities**

Municipal operations and maintenance activities are covered in detail in the BMP Manual (Appendix 7). For each activity, BMPs to prevent and reduce the runoff of identified pollutants are outlined.

Street sweeping of applicant owned and operated streets, parking lots, and other impervious surfaces are prioritized based on preventing or reducing pollutant runoff. Areas were assigned a priority of high, medium, or low based on the effectiveness of sweeping intervals during the previous permitting period. The SWPPI and the evaluation in the biannual progress reports provided extensive baseline data to evaluate the relative needs of areas throughout the regulated MS4. Prioritization is based on this data. The prioritized inventory will be reviewed for accuracy and effectiveness every 2 years as part of the progress report. New areas that will be a part of the street sweeping program will be added to the applicable priority ranking within 30 days of construction.

The list of prioritized locations, and sweeping intervals, are described in the BMP table in Section X of the SWMP. Procedures for the sweeping methods and dewatering, storage and disposal of materials extracted are provided in the BMP Manual in Appendix 7.

## **Managing Vegetated Properties**

Requirements for pesticide applicators are outlined in the BMP Manual and comply with Michigan Act 24 – New Pesticide Requirements; Act 451, Part 83, Pesticide Control; Regulation 633, Restricted Use Pesticides; Regulation 636, Pesticide Applicators; and Regulation 637, Pesticide Use as applicable.

## **Contractor Requirements**

Municipal operations and maintenance conducted by contractors will comply with the procedures as outlined in the BMP Manual (Appendix 7). Appendix 7 will be provided to contractors as a part of the bidding and/or contract process. Completed contracts will include language requiring contractor compliance with Appendix 7 and pollution prevention and good housekeeping practices. Inspection and maintenance intervals and reporting as outlined in the BMP tables in Section X of the SWMP will provide documentation of contractor oversight and compliance.

## **Employee Training**

The employee training program is detailed in the BMP tables in Section X of the report. All training will occur at least once per permit cycle and within one year of hire for new staff. Training topics are identified below:

- General stormwater education
- Maintenance activities, maintenance schedules, and inspection procedures
- Controls on streets, parking lots, maintenance garages, and storage yards
  - Stormwater Pollution Prevention
  - Spill Response
- Controls to reduce discharge of pesticides, herbicides, and fertilizers
- IDEP: identification and reporting

## IX. Total Maximum Daily Load Implementation Plan

Permittees within the Lower Grand River Watershed serving on the Technical Committee have prepared and reviewed this TMDL Implementation Plan. The Plan will be implemented collaboratively with watershed partners to address water body impairments within the regulated areas of the watershed. The Plan addresses the pollutants identified in the notification letters, which are included in Appendix 1 of the SWMP and summarized in the table below.

<b>Table 6. TMDLs Addressed in Regulated Area</b>		
<b>Community</b>	<b><i>E. coli</i> TMDL</b>	<b>Biota TMDL</b>
City of East Grand Rapids	Grand River, Plaster Creek	Plaster Creek
Forest Hills Public Schools	Grand River	Unnamed Tributary to the Grand River
Village of Fruitport	n/a*	n/a*
Georgetown Charter Township	Bass River	Bass River
City of Grand Rapids	Grand River, Plaster Creek, Buck Creek	Unnamed Tributary to the Grand River, Plaster Creek
Grand Rapids Charter Township	n/a	Unnamed Tributary to the Grand River
City of Grandville	Grand River, Buck Creek	n/a
Kent County Drain Commissioner and Administration	Grand River, Plaster Creek, Buck Creek	Sand Creek, York Creek, Plaster Creek, Strawberry Creek, Unnamed Tributary to the Grand River
Kent County Road Commission	Grand River, Plaster Creek, Buck Creek	Sand Creek, York Creek, Plaster Creek, Strawberry Creek, Unnamed Tributary to the Grand River
City of Kentwood	Grand River, Plaster Creek, Buck Creek	Plaster Creek
Plainfield Charter Township	Grand River	n/a
City of Walker	Grand River	Sand Creek
City of Wyoming	Grand River, Plaster Creek, Buck Creek	Plaster Creek

*\*The Village of Fruitport notification letter identified TMDLs for Black Creek and Little Black Creek. A review of the watershed maps included in the TMDL reports for these two waterbodies show that while Fruitport Township is within the watersheds for both Creeks, the Village of Fruitport MS4 drains entirely into the Lower Grand River Watershed. Therefore, these TMDLs do not apply to the Village of Fruitport.*



The procedure of identifying and prioritizing BMPs currently being implemented or to be implemented during the permit cycle included a review by the Technical Committee of proposed BMPs. The BMPs are prioritized based on their contribution towards achieving the pollutant load reduction requirement in each previously identified TMDL (*E. coli* and Biota), using the permittees' previous NPDES MS4 Progress Reports, Michigan LID Manual, the Lower Grand River Watershed Management Plan, and through the development of the BMP Manual (Appendix 7). BMPs are assigned a priority of High (H), Medium (M), or Low (L) based on their anticipated impact. General (G) indicates implementation of a BMP even if it does not directly contribute to a TMDL identified pollutant load reduction. For each BMP, Section X provides a measureable goal, a schedule to begin implementing the BMP, frequency of implementing the BMP, and a measure of assessment for the BMP to record progress in achieving the TMDL pollutant load reduction. The procedure for reviewing, updating and revising BMPs entails reviewing the BMP data included in the Progress Reports and by responding to the results of the monitoring conducted at specific locations to assess trends in water quality improvement.

The prioritized BMPs that are or will be implemented to make progress toward reducing a TMDL pollutant load are included in Section X of the SWMP. The list of BMPs is organized to correspond with each section of the SWMP.

The overall monitoring manual for assessing the effectiveness of the BMPs is described included in Appendix 8. The locations for this monitoring are identified in Appendix 8. The plan proposes monitoring on a quarterly basis, if funding is available. If funding is limited, permittees have committed to monitoring for *E. coli* and TSS at least two times during the permit cycle.

This monitoring will take place in addition to the ongoing sampling conducted by the City of Grand Rapids through the Grand River Water Quality Index (WQI). The WQI is used to show the trend of Grand River water quality downstream of Grand Rapids. A WQI of 71-90 indicates good water quality with high diversity of aquatic life and very few limits for recreational use. Grand Rapids has been monitoring the Grand River for forty years and all of the data is available upon request. A record of the WQI for Wealthy Street Bridge is provided as an example of improving water quality in the Grand River. An interactive map and data from recent sampling events can be viewed at the following URL:

[https://grandrapids.maps.arcgis.com/apps/Embed/index.html?webmap=b58bd9f6cda949599b15753b888a7048&extent=-85.8676,42.8116,-85.4244,43.0326&zoom=true&scale=true&search=true&searchextent=false&legend=true&disable\\_scroll=false&theme=light](https://grandrapids.maps.arcgis.com/apps/Embed/index.html?webmap=b58bd9f6cda949599b15753b888a7048&extent=-85.8676,42.8116,-85.4244,43.0326&zoom=true&scale=true&search=true&searchextent=false&legend=true&disable_scroll=false&theme=light)

## X. BMP Tables

The table below lists the BMPs identified in each section of the SWMP. The BMPs have been prioritized based on their contribution towards achieving the pollutant load reduction requirement in each previously identified TMDL. BMPs are assigned a priority of High (H), Medium (M), or Low (L) based on their anticipated impact. General (G) indicates implementation of a BMP even if it does not directly contribute to a TMDL identified pollutant's load reduction.

<b>Table 7. Enforcement Response Procedure BMP</b>						
<b>BMP</b>	<b>Measurable Goal</b>	<b>Schedule</b>	<b>Frequency</b>	<b>Measure of Assessment/ Suggested Record Keeping</b>	<b>TMDL Priority</b>	
					<b><i>E. coli</i></b>	<b>Biota</b>
Implement Enforcement Response Procedure	All incidents of noncompliance are documented	Upon permit issuance	When events occur	Are instances of non-compliance able to be resolved using the existing regulatory mechanism or policy? Track the number of enforcement responses initiated and resolved.	G	G

<b>Table 8. Public Participation Plan BMPs</b>						
<b>BMP</b>	<b>Measurable Goal</b>	<b>Schedule</b>	<b>Frequency</b>	<b>Measure of Assessment/ Suggested Record Keeping</b>	<b>TMDL Priority</b>	
					<b><i>E. coli</i></b>	<b>Biota</b>
SWMP Public Inspection & Comment	Public participation on the development of the SWMP	Within 6 months of permit issuance	Once	Did comments received result in modifications to the SWMP? Number of comments received Summary of modifications	G	G

**Table 8. Public Participation Plan BMPs**

BMP	Measurable Goal	Schedule	Frequency	Measure of Assessment/ Suggested Record Keeping	TMDL Priority	
					<i>E. coli</i>	Biota
SWMP periodic review	Public participation in review of the SWMP	After first reporting period	Every 2 years	Did comments received result in revisions to the SWMP? Number of comments received Summary of revisions	G	G

**Table 9. Public Education Plan BMP**

BMP	Measurable Goal	Schedule	Frequency	Measure of Assessment/ Suggested Record Keeping	TMDL Priority	
					<i>E. coli</i>	Biota
Implement Approved Public Education Plan (PEP)	See Table 2 of PEP	Ongoing	See Table 2 of PEP	See Table 2 of PEP	H	G

**Table 10. Illicit Discharge Elimination Plan BMPs**

BMP	Measurable Goal	Schedule	Frequency	Measure of Assessment/ Suggested Record Keeping	TMDL Priority	
					<i>E. coli</i>	Biota
Implement Approved Illicit Discharge Elimination Plan (IDEP)	See Section 2 of IDEP	Ongoing	See Section 6 of IDEP	See Section 10 of IDEP	H	G

**Table 10. Illicit Discharge Elimination Plan BMPs**

BMP	Measurable Goal	Schedule	Frequency	Measure of Assessment/ Suggested Record Keeping	TMDL Priority	
					<i>E. coli</i>	Biota
Illicit Discharge Training	Complete training as described in SWMP	Ongoing	Once per permit cycle and within one year for new hires	Training Logs	H	G
Responding to contaminated groundwater discharges to MS4	All identified discharges are referred to MDEQ for an NPDES permit or violation notice	Upon permit issuance	As they are discovered	Number of sites identified and reported to MDEQ	L	L

**Table 11. Construction Stormwater Runoff Control Program BMPs**

BMP	Measurable Goal	Schedule	Frequency	Measure of Assessment/ Suggested Record Keeping	TMDL Priority	
					<i>E. coli</i>	Biota
Report discharges of sediment from active construction sites to the permitting Part 91 agency	All discharges reported	Ongoing	As discharges occur	Are reported discharges able to be resolved using the existing regulatory mechanism or policy? Number of discharges reported to MEA/CEA and MDEQ	G	H
Notify property owner of permitted construction	Provide property owner contact information on Part 91 permit applications	Ongoing	As permits are issued	Number of permits issued	G	H

**Table 11. Construction Stormwater Runoff Control Program BMPs**

BMP	Measurable Goal	Schedule	Frequency	Measure of Assessment/ Suggested Record Keeping	TMDL Priority	
					<i>E. coli</i>	Biota
Site plan review of disturbed area	Sites over one acre referred to MEA/CEA Sites over five acres referred to MDEQ	Ongoing	As site plans are reviewed	Are the site plan review criteria appropriate triggers for review of sites? Number of site plan reviewed Number of sites referred for permitting	G	H

**Table 12. Post-Construction Stormwater Runoff Program BMPs**

BMP	Measurable Goal	Schedule	Frequency	Measure of Assessment/ Suggested Record Keeping	TMDL Priority	
					<i>E. coli</i>	Biota
Implement a post-construction control regulatory mechanism	Ordinance or regulatory mechanisms adoption	6 months after permit issuance	Once	Are developers able to comply with the regulations and meet the community's master plan goals? Date of ordinance or regulatory mechanism adoption	G	H
Tracking for off-site mitigation and payment-in-lieu	Sites utilizing off-site mitigation or payment-in-lieu meet regulatory criteria	After ordinance or regulatory mechanism adopted	As site plans are approved for off-site mitigation and within approved time frame in permit for payment-in-lieu	Are the locations and designs for the off-site mitigation or payment-in-lieu site an improvement for downstream water quality? Number of off-site mitigation/payment-in-lieu projects approved and constructed	G	M

**Table 12. Post-Construction Stormwater Runoff Program BMPs**

BMP	Measurable Goal	Schedule	Frequency	Measure of Assessment/ Suggested Record Keeping	TMDL Priority	
					<i>E. coli</i>	Biota
Site plan review for development	All sites that trigger post-construction control requirements going through the site plan review process	After ordinance or regulatory mechanism adopted	As site plans are submitted, reviewed, and approved	Are site plan review criteria sufficient to ensure all sites requiring post-construction controls under the ordinance undergo site plan review? Document and identify resolution for any sites requiring post-construction controls that did not undergo site plan review.	G	M
Developer is meeting post-construction performance standards	All sites requiring post-construction controls are complying with design standards	After ordinance or regulatory mechanism adopted	As site plans are submitted, reviewed, and approved	Number of sites meeting the design standards onsite vs. off-site.	G	M



<b>Table 12. Post-Construction Stormwater Runoff Program BMPs</b>						
<b>BMP</b>	<b>Measurable Goal</b>	<b>Schedule</b>	<b>Frequency</b>	<b>Measure of Assessment/ Suggested Record Keeping</b>	<b>TMDL Priority</b>	
					<b><i>E. coli</i></b>	<b>Biota</b>
Developer is maintaining long-term operation and maintenance	All approved sites submit a maintenance agreement	After ordinance or regulatory mechanism adopted	As site plans are submitted, reviewed, and approved	Is the maintenance agreement sufficient to ensure that the long term operation and maintenance is conducted? Number of agreements completed	G	H
	All approved sites conduct regular inspections and maintenance and provide documentation to the MS4		According to the interval within the approved ordinance or regulatory mechanism	Are inspection and maintenance requirements sufficient to ensure that the controls are functioning properly?  Number of inspections and maintenance performed	G	M

**Table 13. Pollution Prevention and Good Housekeeping Program BMPs.**

<b>BMP</b>	<b>Measurable Goal</b>	<b>Schedule</b>	<b>Frequency</b>	<b>Measure of Assessment/ Suggested Record Keeping</b>	<b>TMDL Priority</b>	
					<b><i>E. coli</i></b>	<b>Biota</b>
Municipal Facility Inventory	Inventory and assessments are accurate and up to date	Ongoing	Review every 2 years and update within 30 days for new facilities or structural controls	All facilities, facility maps and structural controls are identified. Potential to discharge evaluations are accurate 'Updated on' field will track revisions	G	G
High Potential to Discharge SOP	SOP is accurate and up to date	Ongoing	Review every 2 years and update within 30 days for new facilities or structural controls	Are inspection intervals sufficient to identify problems onsite? Routine Inspection Forms Comprehensive Inspection Forms	G	H
Catch Basin inspection and maintenance	Annual catch basin cleaning activity is consistent with prioritization schedule	Upon permit Issuance	See Table 17	Are the inspection and maintenance intervals sufficient to prevent pollutant discharge? Catch basin inspection and maintenance logs	G	H
Street Sweeping	Annual street sweeping activity is consistent with prioritization schedule	Upon permit Issuance	See Table 18	Is the sweeping schedule sufficient to prevent pollutant discharge? Street sweeping/disposal logs	G	H
Inspection and maintenance of stormwater structural controls	Inspection and maintenance activities are consistent with schedule in SWMP	Upon permit Issuance	See Table 16	Are the inspection and maintenance intervals sufficient to prevent pollutant discharge? Structural control inspection and maintenance logs	G	H
Managing Vegetated Properties	All pesticide applicators licensed by the state of Michigan.	Upon permit Issuance	Ongoing	Track licensing of all staff members or contractors responsible for pesticide application. Report of any instances of non-certified personnel applying pesticides.	G	G

<b>Table 14. Pollution Prevention and Good Housekeeping Program Training BMPs</b>							
<b>BMP</b>		<b>Measurable Goal</b>	<b>Schedule</b>	<b>Frequency</b>	<b>Measure of Assessment/ Suggested Record Keeping</b>	<b>TMDL Priority</b>	
						<i>E. coli</i>	Biota
<b>Training</b>	Pollution Prevention and Good Housekeeping Program	All employees trained	Before the end of the permit cycle	Once per permit cycle and within one year for new hires	Training Logs	G	H
	Contractor Oversight	Contactors receive a copy of the procedural BMPs as they relate to their contract.	Upon permit Issuance	As contracts are issued or renewed	Contractor Log	G	H

<b>Table 15. Total Maximum Daily Load Program BMPs</b>							
<b>BMP</b>		<b>Measurable Goal</b>	<b>Schedule</b>	<b>Frequency</b>	<b>Measure of Assessment/ Suggested Record Keeping</b>	<b>TMDL Priority</b>	
						<i>E. coli</i>	Biota
Identify and prioritize BMPs for TMDL Pollutant Load Reduction		BMPs are contributing to a reduction in TMDL identified Pollutants	Ongoing	Review every 2 years	Bi-annual reporting on BMP actions	H	H
Monitoring plan to assess TMDL load reduction		Reduction in TMDL identified Pollutants	Within two years of permit issuance	At least twice during permit cycle	TMDL Monitoring Results	H	H

**Table 16. Structural Stormwater Controls Inspection and Maintenance Schedule**

<b>Structural BMP</b>	<b>Inspection Frequency</b>	<b>Maintenance Frequency</b>	<b>Disposal</b>	<b>TSS Removal</b>
Vegetated Swales	Every 3 years	As needed	Per the BMP manual procedure	Medium/High
Constructed Wetlands	Every 3 years	As needed	Per the BMP manual procedure	Medium/High
Porous Pavement	N/A	N/A	N/A	High
Pump Stations	Weekly	As needed	Landfill	N/A
Secondary Containment	N/A	N/A	N/A	N/A
Underground Storage Vault or Tanks	N/A	N/A	N/A	Low
Vegetated Buffer Strips	N/A	N/A	N/A	Medium/Low
Detention Ponds	Annually	As needed	Landfill	Medium/High
Bioretention	N/A	N/A	N/A	Medium/High
Infiltration Basins or Trenches	N/A	N/A	N/A	High
Oil/Water or Grit Separator	N/A	N/A	N/A	High

**Table 17. Catch Basin Cleaning Prioritization**

The table below prioritizes applicant owned catch basins for cleaning based on their potential to discharge pollutions to surface waters of the state. Locations may be described or referenced on a map.

<b>Location</b>	<b>Priority (High, Medium, or Low)</b>	<b>Inspection Frequency</b>	<b>Maintenance Frequency</b>	<b>Disposal</b>	<b>TSS Removal (High, Medium, or Low)</b>
City-wide	Medium	One half of total annually	As needed	Landfill	Medium/Low

**Table 18. Sweeping Prioritization**

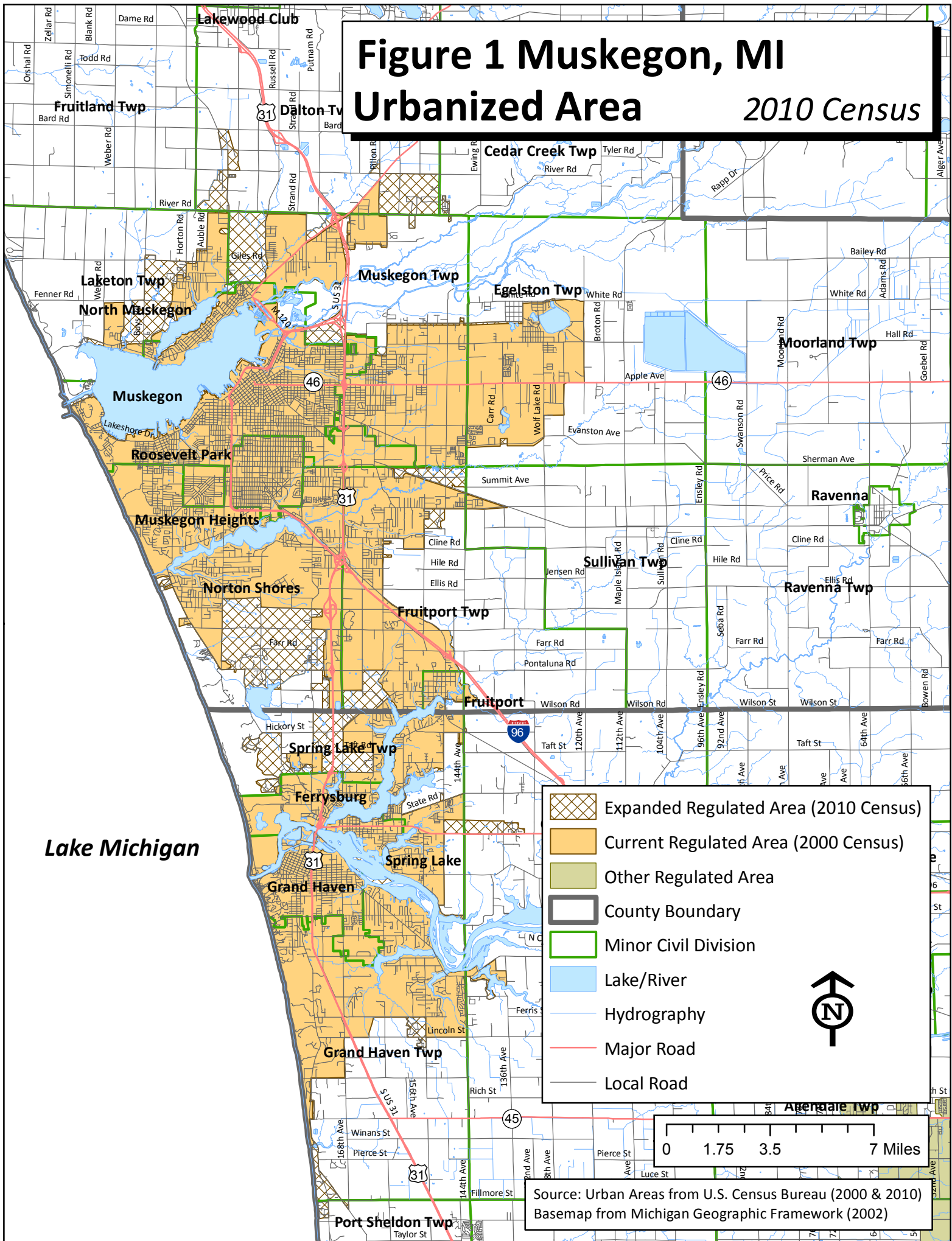
The table below prioritizes applicant owned impervious surfaces for sweeping based on their potential to discharge pollutions to surface waters of the state. Locations may be described or referenced on a map.

<b>Location</b>	<b>Priority (High, Medium, or Low)</b>	<b>Sweeping Frequency</b>	<b>Disposal</b>	<b>TSS Removal (High, Medium, or Low)</b>
City-wide	Medium	Annually	Landfill	Medium/Low

## Figures

# Figure 1 Muskegon, MI Urbanized Area

2010 Census





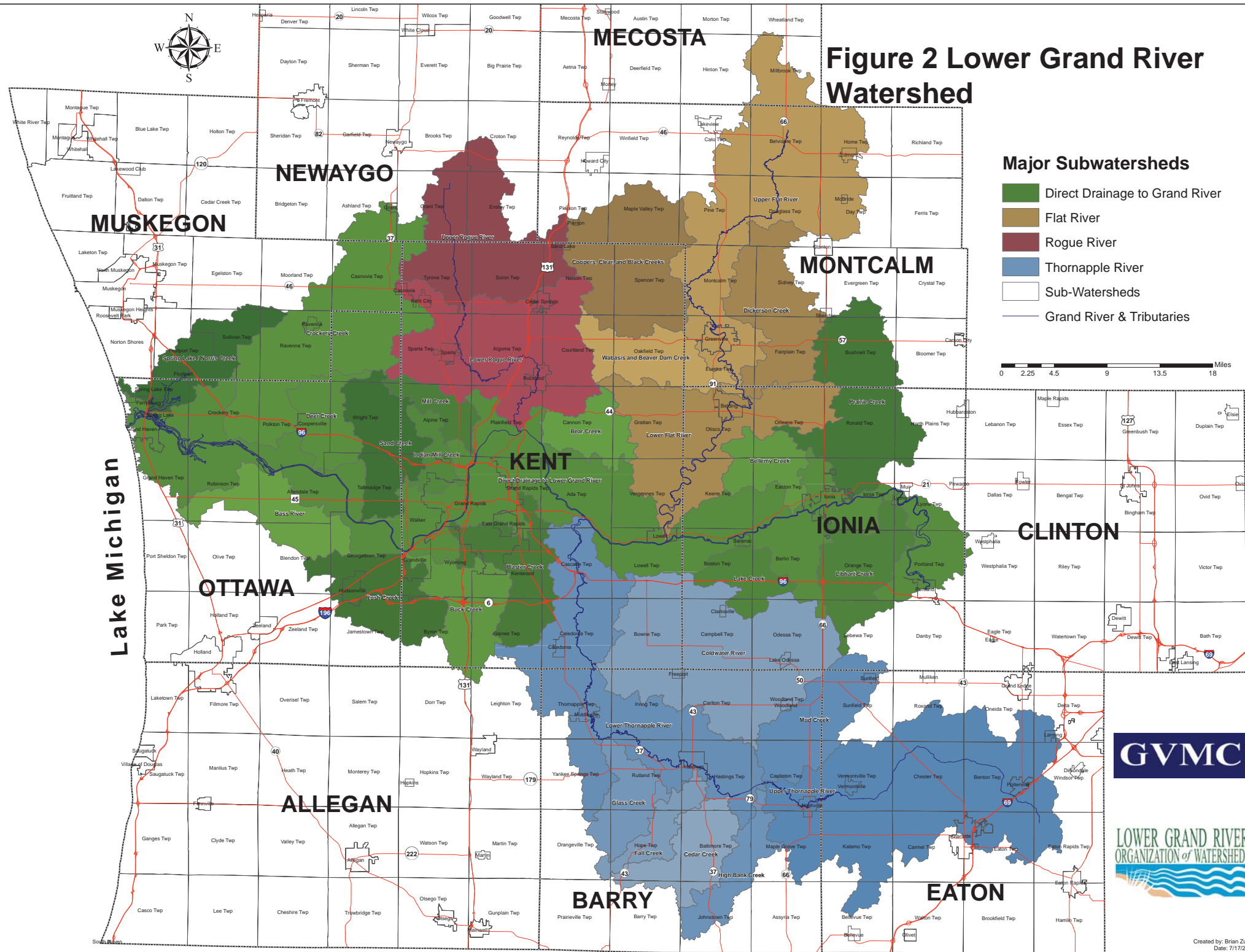
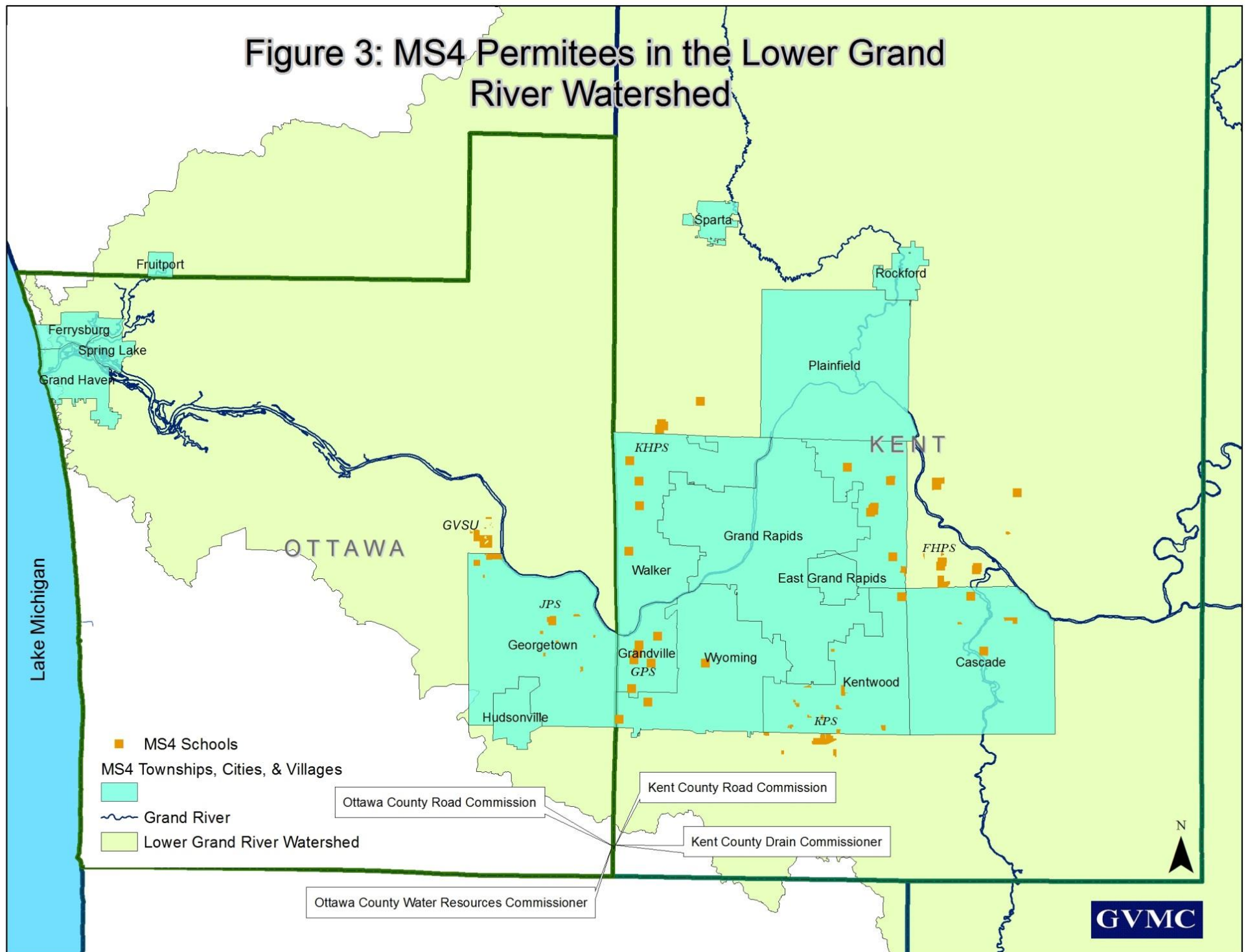


Figure 3: MS4 Permittees in the Lower Grand River Watershed



## **Appendix 1**

## **Appendix 2**

## **Appendix 3**

## **Appendix 4**

## **Appendix 5**

## **Appendix 6**



## **Appendix 7**

## **Appendix 8**